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## Next level grinding

In the past year, the future has once again turned into a collection of uncertainties. Nevertheless, there are numerous positive developments which prepare our grinding industry for the substantial changes in the market. The high-tech grinding machine manufacturer Haas Schleifmaschinen from Trossingen in Germany, with its pioneering spirit, is presenting itself once again as a trendsetter at the international trade fair for grinding technology GrindTec.

"At Haas Schleifmaschinen, we not only have a clear vision of the future, we also have a concrete plan. This makes the future a plannable, strategically useful factor for us. On the path to that goal, we define milestones that we can adjust promptly. In this way, we always remain open and flexible for the demanding needs of our customers," explains Marie-Sophie Maier-Wember, member of the management board.



"Our customers expect concrete progress, if not giant jumps in precision, automation, digitalisation and economic efficiency. We are working on fields of development at a time when questions in the market are just beginning to assume shape. This corporate philosophy triggers an enormous dynamic. GrindTec 2020 offers us a welcome platform to demonstrate our technological progress.

"Haas Schleifmaschinen shows the future in the here and now, because if you only talk about the future abstractly, you lose the idea. At our stand in the new Hall 2, exhibition visitors will get a concrete update on exactly the topics they are currently dealing with and some valuable inspiration for them."

### Software is the most important component of the grinding machine

Marie-Sophie Maier-Wember is responsible for the software department at Haas. The combination of mechanical engineering and software development gives the company a unique competitive position.

"Basically, we don't actually sell grinding machines. We provide our customers with a turnkey solution tailored to their requirements. This usually includes a Haas Multigrind® grinding machine. The Multigrind Horizon software is always part of the solution. In the two examples of tool grinding described above, the software ensures the corresponding technological leap. The software solution turns the highly flexible grinding machines from the Multigrind series into high-tech tools. It is only from this unique combination that we are able to offer our customers maximum added value," says Marie-Sophie Maier-Wember, describing the benefit that the Trossingen-based company offers every customer.

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# GrindTec 2020 bucks the trend

World's leading trade fair for grinding technology continues to grow despite difficult trading conditions



The ongoing trade crisis with the USA, the automobile market shrinking worldwide for the first time and the difficult transformation process to E-mobility taking place in Germany. Against this negative background, GrindTec currently boasts 600 exhibitors, a moderate increase in comparison to the 578 participating previously, while the occupied area has increased to an area of 46,500 m<sup>2</sup>. GrindTec 2020 will present more exhibits than ever before. The number of nations participating has also increased, with companies from 32 countries (29 in 2018) presenting their innovations in Augsburg. The proportion of foreign exhibitors totals 44 percent. The number of companies from China, Korea, Japan or India is continuing to grow.

In the third quarter of 2019, incoming orders decreased in Germany by about a quarter. Foreign trade, which is extremely important for an exporting country like Germany, is less affected. Seen globally, experts predict a decrease of only four percent for the year 2020.

Despite all these uncertainties, the market is still strong. Production of grinding tools and abrasives is worth more than a billion euros in Germany. Visitors to GrindTec 2020 can also expect to find additive manufactured grinding discs, grinding discs with integrated sensor technology, additive manufactured flow-optimised cooling lubricant nozzles, hybrid grinding machine concepts that also integrate other

manufacturing technologies, direct drives in the grinding machine shafts to improve dynamic stiffness and precision as well as improving performance, to name just a few examples.

Digitalisation, networking and automation form the basis for companies wanting to be successful on the world market. The manufacturers of machines and periphery systems as well as process and tool technology also supply answers at the GrindTec to the new demands made of tool grinding.

## GrindTec Campus: cutting edge research and development

Research and development have long been the major thrust in the high-tech world of modern tool and grinding technology. Numerous research institutes are represented at GrindTec 2020 in the foyer of Hall 1 (Schwabenhalle).

## FDPW - Competence centre for grinding technology

The Trade Association of Precision Toolmakers (FDPW), together with its international partners, will be present in the conference centre of the Augsburg exhibition centre. In addition to this, the association's service partners will also introduce themselves personally and supply information about their offers, which could be of great interest to the grinding technology companies. The GrindTec Forum, with its lectures on current themes and the Jakob Preh school from Bad Neustadt, which is the only vocational school that trains precision toolmakers, can also be found here. Together with the GrindTec Campus, this combination

supplies insight into the cutting edge of user-related research and development

## "Tool grinder of the year 2020" competition

For the first time, Roman Roell, Bavarian radio presenter and experienced boxing commentator, is presenting the "Tool grinder of the year" competition.

The competition should show the occupational profile of a tool grinder the way it is, i.e. challenging, exciting, varied and high-tech.

Together with Schneeberger GmbH and the FDPW Academy, the specialist magazine "fertigung" is looking for the best of its trade at the exhibition. In addition to great technical competence and highly skilled craftsmanship, a view of the economic possibilities is also called for. The welterweight professional boxer Timo Schwarzkopf can also be seen live at the trade fair, where he explains what grinding tool mechanics have in common with professional sportsmen.

The five best competitors, who have qualified through a theoretical selection procedure for the final, enter the ring on 19 March in Hall 1. Here they will programme a workpiece on one of the two Schneeberger-Aries-NGP grinding machines and produce it live in front of the public: an exciting showdown between the two best finalists will determine the overall winner at the trade fair.

The [www.grindtec.de](http://www.grindtec.de) website can be accessed from any mobile device. In conjunction with free-of-charge WLAN for visitors at the Augsburg exhibition centre, all functions of the GrindTec website can also be used by mobile devices on location. The following download services, amongst others, will be available: the interactive exhibitor index / exhibitor search, press information and photos, hall plans, the activation of guest tickets, or the ticket shop (purchase of E-tickets or mobile passbook tickets).

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# GrindTec 2020

18 - 21 March  
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**98** % of the visitors are generally  
(completely) satisfied with their visit  
to the GrindTec 2018.\*

**83** % of the visitors were able to make  
valuable new contacts, **32%** visit only  
the GrindTec to obtain information  
about branch developments.\*

**98** % of them evaluated the GrindTec 2018  
spectrum of offers with the grades of  
1 to 3.\*

\*Gelszus Messe-Marktforschung, Dortmund

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# Walter to unveil two new machines at GrindTec

Walter will be introducing two new machines at the forthcoming GrindTec exhibition and, while full details of the new duo will not be released until the exhibition doors open, it has been announced that one of the new arrivals will be the twin-spindle option for the Helitronic Power 400 tool grinder and for the Helitronic Power Diamond 400 'two-in-one' tool eroding and grinding machine.

The twin-spindle option machines offer 24 kW and can accommodate tools up to 520 mm long and up to 380 mm diameter.

In addition to releasing a number of other tool production and measurement innovations as part of the United Grinding Group display, Walter Ewag UK says Walter will also show the Helicheck Plus tool measuring machine with integrated robot laser marking (after cleaning), while Ewag will have the Laser Line Ultra, Compact Line and Profile Line insert production machines on show.

The Ewag Laser Line Ultra represents state-of-the-art, ultra-short pulse laser machining of all cutting materials and accommodates inserts up to 200 mm diameter and up to 250 mm long, while the Profile Line is targeted at the production of complex insert geometries, including interchangeable cutting inserts and rotationally symmetrical drilling and milling inserts of HSS, carbide, cermet and ceramic.

Meanwhile, the 6-axis Compact Line is designed for grinding (including peripheral grinding) inserts of tungsten carbide, cermet, ceramic, PCBN and PCD.

The machine's traverses in the X, Y and Z axes are 450 mm, 180 mm and 150 mm, respectively, with axis resolution of 0.0001 mm. The 5.5 kW grinding spindle produces 7,000 revs/min.

A 'three-in-one' dressing unit ensures grinding wheel concentricity and high process reproducibility, plus it offers wheel dressing, regeneration and 'crushing' in a single package. Machine usability and effectiveness is also guaranteed by the integrated ProGrind software, and the FANUC control system enables all grinding routines to be programmed quickly and easily via its user-friendly touch-screen panel.

Applying protective chamfers on the inserts' main cutting edges is ensured by the machine's optimised kinematics as well as by the new C-axis. Machine downtime is minimised by the machine's short travel distances and by the integrated 6-axis FANUC robot that offers agile handling and a high degree of flexibility for loading complex inserts.



Laser marking on the Walter Helicheck Plus

Walter Maschinenbau GmbH produces CNC machines for grinding and/or eroding metal, wood and PCD tools and rotationally symmetrical production components.

The production range is supplemented by CNC measuring machines for non-contact complete measurement of complex precision tools and rotationally symmetrical parts with documented accuracy in a single clamping.

Walter's grinding and measuring expertise is incorporated into the development of our own software. It also offers comprehensive "tool machining" services.

Together with its sister company Ewag AG and its broad product range for the production of indexable inserts, including innovative laser machines tools, Walter sees itself as a system and solution provider for tool machining. Walter and Ewag together represent the technology group for tool processing within the larger United Grinding Group.

The United Grinding stand at GrindTec will again provide a major hub of interest, with an impressive range of equipment on show, including the latest version of the Blohm PROFIMAT XT. For further information, contact:

**Walter Ewag UK Ltd**  
**Tel: 01926 485047**  
**Email: [neil.whittingham@walter-machines.de](mailto:neil.whittingham@walter-machines.de)**  
**[www.walter-machines.com](http://www.walter-machines.com)**

**HALL 2 - STAND 2055**



Ewag's Compact Line

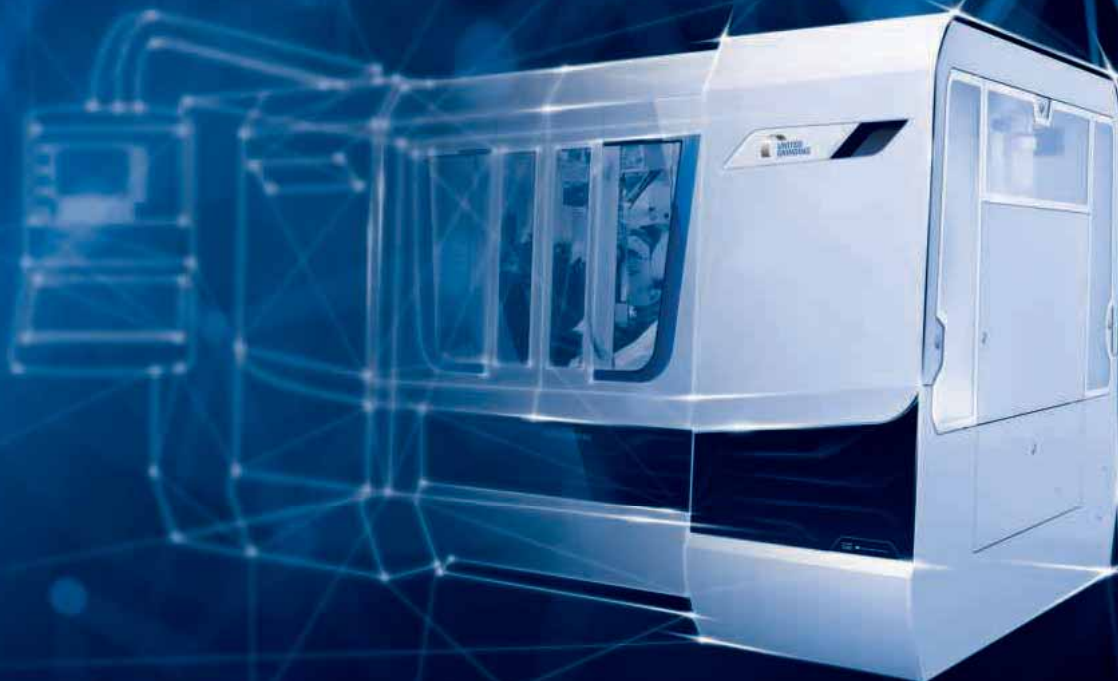
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Augsburg**

18.–21.3.2020

Hall 2,  
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➤ [grinding.ch](http://grinding.ch)



# Update your future

Haas Schleifmaschinen shows the future of precision grinding at GrindTec with the Multigrind® CB XL

Haas Schleifmaschinen is one of the founding members of the GrindTec exhibition and has its origins in tool grinding. At this year's event, the company will present two innovative solutions in this field, which enable cutting inserts and taps to be manufactured much more economically and with even greater precision in the future.

The grinding expert from Baden-Württemberg will present a whole range of highlights and world innovations. Visitors can look forward to new processes in the production of profile rolls, forming tools, as well as roller and bevel gears. New processes can also be expected for production of worm shafts, turbine parts and knee implants. Here, too, Haas Schleifmaschinen is anticipating a piece of the future.

Another highlight is the Multigrind® Styx visualisation software.

### The perfect profile insert on the Multigrind® CU

Until now, manufacturers of profile cutters often had to dress their diamond grinding wheels in order to produce an exact corner radius again. This costs time and causes additional wear. Now the grinding experts are combining the established Xing dressing with continuous measurement on the workpiece. With the unique combination of contour compensation and Xing dressing, Haas Schleifmaschinen achieve high-precision, reproducible peak values in dimensional accuracy and great time savings through significantly less dressing. Marie-Sophie Maier-Wember explains: "The customer benefit is obvious: economical and precise grinding in a fully automated, continuous process from special plates to small batches and large series production".

### Manufacturing taps "just in time" in only one clamping

As another highlight, Haas Schleifmaschinen invites all manufacturers of taps and thread formers to rethink and recalculate their existing manufacturing process. Instead of performing each production step individually on three or four single-purpose machines and losing precision by reclamping, taps can now be machined fully

The Multigrind CB XL: New dimensions for precision grinding



automatically on the Multigrind in just one clamping. With fast setup and loading, maximum cutting performance even in ultra-hard materials, fast, precise dressing, Haas offers "just in time" production as a better economic alternative: both maximum precision and flexibility at lower unit costs, from large series to batch size 1.

"With fast production preparation, significantly shorter setup times, no stock-keeping or idle time between operations, Haas grinding machines allow tap manufacturers to completely redesign their process. I am already looking forward to the discussions at the GrindTec," says Marie-Sophie Maier-Wember.

### Software as key component of the grinding machine

"We don't actually sell grinding machines," says Marie-Sophie Maier-Wember. "We provide our customers with a turnkey solution tailored to their requirements. This usually includes a Multigrind machine. The Multigrind Horizon software is always part of the solution. In the two examples of tool grinding described above, the software ensures the corresponding technological leap. The software solution turns the highly flexible grinding machines from the Multigrind series into high-tech tools. It is only from this unique combination that we are able to offer our customers maximum added value."

### Multigrind Styx: Grinding with maximum accuracy

The new simulation software from the grinding experts is not a simulation software in the strict sense, because Multigrind Styx shows pixels without triangulation and with maximum accuracy. Thanks to ray tracing,



Multigrind Styx: Grinding with maximum accuracy

simulation becomes visualisation, so that all grinding processes can be completely visualised in advance. Instead of reconstructing surfaces, Multigrind Styx displays any shape, pixel-precise and without restrictions. Multigrind Styx shows the workpiece data down to the smallest detail. Irregularities and transitions, even ripples in the workpiece surface are displayed and can be corrected before the grinding operation starts. This saves time, material and nerves.

"Thanks to a Cloud-based solution, customers now need less computing power for more performance and that pays off immediately." Marie-Sophie Maier-Wember shows the pixel-precise visualisation examples that she and her team are currently preparing for the GrindTec. "In the near future there will be so much going on at Haas Schleifmaschinen that I just can't shake off the feeling of skipping the present immediately."

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**HALL 2 - STAND 2002**



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# GrindTec provides the perfect platform for two new Hardinge grinding machines

Two new and innovative high precision grinding machines manufactured by Hardinge specialist grinding companies will be debuted at the forthcoming GrindTec International Trade Fair for grinding technology.

Taking pride of place will be the all new Voumard 1000 Universal CNC internal grinding machine which will be fully operational and on public view for the first time, while another Hardinge machine highlight will be an addition to its extensive universal grinding machine portfolio.



Both machines feature significant design innovations coupled with ease-of-use, underlying Hardinge's focus on combining advanced design characteristics with quality and precision towards creating a highly productivity solution for the end user.

The new Voumard 1000 is a high-performance, economical grinder for the widest range of universal internal grinding requirements to obtain fine surface finishes and tight tolerances. A primary design feature is the use of hydrostatic guideways which are standard on all axes and produce the very highest machine performance across all ID grinding applications. They provide excellent damping, stick and slip-free operation and very rigid wrap around guideways, resulting in outstanding surface quality and more reliability without any friction loss and wear.

Hardinge believes the machine's characteristics set a new standard in ID grinding, providing customers with the ultimate combination of precision and performance in an affordable machine. Its design optimises production costs when



manufacturing high-precision parts for industries ranging from aerospace to medical with typical applications being grinding operations on parts for hydraulic components, spindles, bearings, and gears.

For over 80 years, the Voumard brand has been a global leader in innovative ID/OD grinding with almost 10,000 installed internal grinding machines around the world. It specialises in machine tools specifically designed for machining work pieces with large diameters and/or lengths.

Acquired by Hardinge in 2014, Voumard is now an integrated part of Hardinge Inc.'s grinding group alongside Jones & Shipman Hardinge, Kellenberger, Hauser, Tschudin, and Usach. Voumard's production and support facility is now back to its roots in Switzerland, where it is within the Kellenberger operations.

In the UK, Jones & Shipman Hardinge, based in Rugby, represents all the Hardinge Grinding and Super Precision® products along with the sales and support for Okamoto grinding machines.

Managing director of Jones & Shipman Hardinge, Mike Duignan states: "We are introducing a brand-new grinding system that incorporates features resulting from customer feedback. These range from the rigid base to the hydrostatic guides in combination with direct drives on all axes to the new user interface on our controls. The result is a CNC machine that exceeds the most demanding of today's grinding requirements."

Other than traditional grinding machine features, the Voumard 1000 offers up to five fully functional CNC axes with outstanding



positioning accuracies in the nanometer range as well as best in class tool and workpiece management. The concept also offers additional movement for dressing and measuring devices.

Mike Duignan adds: "In replacing the Voumard 110, 130 and aspects of the 150 series, the new 1000 machine offers almost infinite configuration options for wide ranging grinding operations. It can accommodate machine workpieces with a length of 300 mm length and 300 mm swing diameter over the table."

In addition to the features highlighted, other key elements of the Voumard 1000 are ultra-precision accuracy with a fast oscillation, direct drive linear motor system; coolant management; a hydrostatic spindle turret configuration for ideal accessibility and accommodating a larger spectrum of parts; hydrostatic B-axis with benchmarking positioning repeatability and a compact "table turret" for collision-free dressing and improved accessibility.

Finally, there is the FANUC 31i control for improved operator access, fast programming and retooling, even for inexperienced operators. This uses the latest BLUE Solution software with object guide for easy operation and short setup times.

To learn more about the new Voumard 1000, visit: **[www.hardinge.com](http://www.hardinge.com)** and enter the grinding section or alternatively contact:

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**HALL 5 - STAND 5114**



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# Multi-technology machines and production cells

ELB-Schliff is a leader in the development of intelligent manufacturing cells for complex parts. The centrepiece of this development is the 5-axis (option 6-axis) millGrind BL10 machining centre, which is able to perform CD-creep-feed grinding, high-speed grinding, milling, drilling, probing and laser cladding operations in one clamping.

Thanks to the high axis speeds, the auxiliary processing times are reduced to a minimum. The machine is equipped with a powerful spindle which is suitable for milling and drilling at up to 10,000 rpm. The overhead dresser is specifically designed for high-productivity creep-feed grinding, providing customers a competitive edge. Additional dressing devices can be installed on the worktable to generate flexible grinding wheel profiles. This is primarily intended for interpolating dressing with diamond form-rolls.

The tool changer enables simultaneous exchange of the overhead dressing roll and grinding wheel. The magazine has room for up to 60 tools, which can include grinding wheels, dressing rolls, measuring probes as well as milling and drilling tools.

The measuring probe is operated by a flexible software package. Clamped unmachined parts can be measured to automatically compensate for positional and clamping errors, and measurements of finished parts are also possible within the usual limitations for measurements on a machine.

Recently, the company has gained extensive experience in the design and implementation of automated



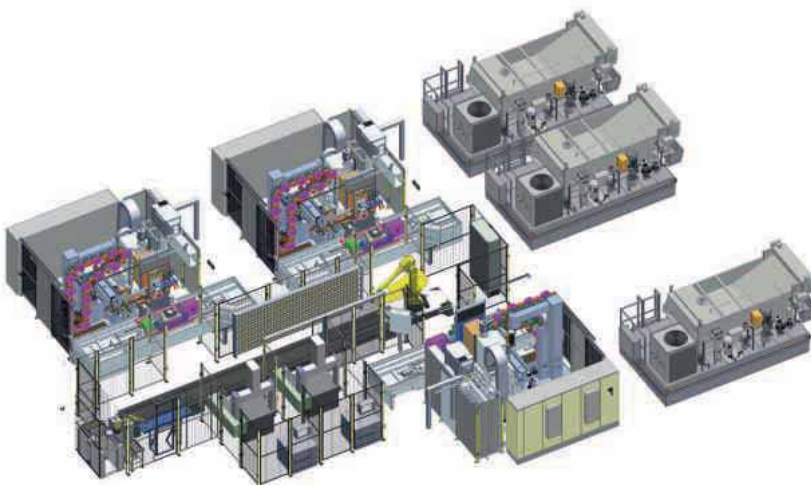
millGrind: multi-technology production in one clamping

manufacturing cells. Flexible cell designs are now offered to customers around the globe. Particularly in the field of turbine components manufacturing, there is a growing demand for cell solutions allowing complete machining of different component families of various lot sizes.

The number of grinding centres in the cell depends on the variant diversity, the number of operations on the individual workpieces, the lot sizes and the annual quantities. In addition to the grinding machines, the cells consist of coordinate measuring machines, handling devices (usually rail-guided 6-axis robots) and a marking station. Optionally, additional components can be added, such as a milling machines for deburring operations, component cleaning systems, material testing systems, automated clamping and unclamping stations.

The cell controller is a computerised monitoring, control and data acquisition system. The main features can be summarised as follows: job management and recipe management, if necessary with a connection to customer ERP and/or PPS systems; control of the part flow between the individual cell components; component data and cell data management and individual reporting functions; KPI evaluation and trend analysis; axis compensation management; error message management; EH&S and emergency stop management; User administration.

Clamping technology is particularly important in automated complete machining. Exact positioning of the workpieces in the fixture is not always possible. Before processing, it is therefore expedient to measure the position of the components in the fixture using a coordinate measuring machine within the cell. The measurement results are then converted into compensation data and assigned to the respective processing machine by the cell control on a component-specific basis. Inside the cell the components, fixtures and tools can be clearly tracked via RFID chips or data-matrix codes, meaning that operating errors are thus virtually eliminated.



Sample layout of an intelligent multi-technology manufacturing cell

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**HALL 7 - STAND 7049**





Hall 3/3017

## GENERATING GEAR GRINDING MADE TRANSPARENT

### Process monitoring

The dressing and grinding intensities are measured and monitored by smart real-time data processing and tested algorithms. For each workpiece, all data generated during dressing and grinding are recorded and stored in a database and remain 100% traceable. Using the stored process and tooling data, including workpiece identification via DMC, offers the means of comprehensive analysis. Due to process interaction, and using preset evaluation limits, workpieces that exceed or fall short of these limits are automatically removed.

### Component monitoring

Recurring automatic testing cycles measure and evaluate all the relevant grinding machine axes involved in the process, and thus enables early detection of electromechanical deviations. Maintenance costs are optimized both in terms of planning and diagnosis, and some potential EOL anomalies may be avoided.

# The first centerless grinding machine in the world born with its Digital Twin

by Claudio Tacchella

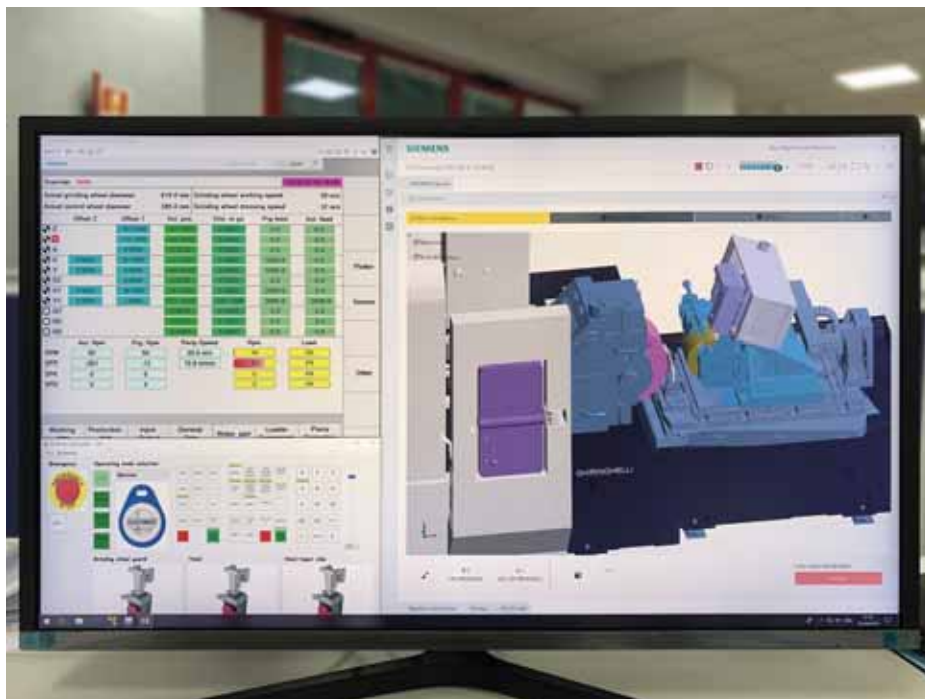
Within the range of machines produced by the Italian company Rettificatrici Ghiringhelli S.p.A., headquartered in Luino (VA), the new APG-S DT machine model exhibited at the GrindTec exhibition is of great technological importance. It stands out for being the first centerless grinding machine in the world produced with Siemens Digital Twin since it is fully controlled by the new digital native CNC Sinumerik-ONE.

Through this innovation, the real and the virtual world combine themselves in a sole interaction system by implementing the concept of digitalization which features the Industry 4.0 paradigm with remarkable advantages. The Digital Twin (DT) accomplished by Ghiringhelli is a digital replication updated in real time of a product, process or system, which can be used for test operations, diagnostics and analysis, well before the physical creation of the represented object.

"The way to do business and above all the methods of design, production and the



The new APG-S DT machine is the first centerless grinding machine in the world born with its Siemens Digital Twin



The data coming from the "TIA Portal" of the Sinumerik-ONE provide the basis for the accomplishment of the Digital Twin

management of the products accomplished, are substantially changing thanks to the support of the technologies which refer to the digitalization and to Industry 4.0, says Patrizia Ghiringhelli, Joint Managing Director of the Rettificatrici Ghiringhelli. The physical world is transposed into a world made up of digital twins which, through prototyping and Big Data, allow to understand which the areas are (product, process, supply chain, business model) to work on in order to improve the functional and the operational efficiency. Industry 4.0 and Digital Twin are therefore two expressions whose contents are bound to improve themselves hand in hand in the future."

The digital twins therefore combine data analysis techniques, artificial intelligence, automatic learning and simulation, and are used for the prototyping of the systems Internet of Things (IoT) and of the life cycle management of the product (PLM). It is interesting to observe that the object virtual model is dynamic, by updating itself every time that its physical twin undergoes



changes. The amount of data gathered by the sensors available in a machine or in a plant is remarkable, so much so that it is correct to talk about Big Data. The information coming from the "smart" sensors, positioned on the machine, is aggregated and organized in order to ease the expected decision-making and computer learning processes.

All data become useful both to the physical world and to the virtual one, by allowing for example to solve, through simulation, design or operational problems, to prevent downtime and to better plan the life cycle of the product. The virtual representation takes full advantage of the new technologies as the IoT, the augmented reality, the cloud computing. Moreover, the availability to convey the interconnections and the Big Data on the new 5<sup>th</sup> Generations' networks (5G) enhances the ability of the digital twin to represent the physical components, their status, position and their interactions. In this context, the level of IT detail of the virtual counterpart can only grow over time, as well as the aspects of the behavior of the replicated system.

"To develop a grinding system that we are asked for with a digital counterpart, - specifies Patrizia Ghiringhelli -, allows us to plan solutions identical to those to be physically accomplished, to simulate their functioning, the technological cycles, the automation, etc, not only before but also after its physical accomplishment and with unprecedented execution speed. The users of the grinding machine can thus take



The new APG-S DT range can be perfectly integrated from an Industry 4.0 viewpoint, performing, reliable and in compliance with the principles of eco-compatibility and with reduced energy impact

advantage of the retooling times or faster setups, and optimize and improve the performances in the field of production, in parts programming, in automation and in all the technological cycles. The production processes endowed of digital twins are now a reality and will allow the companies, who use our centerless grinding machines, to become more flexible by reducing the time-to-market, the expenditure and the maintenance services, by improving the quality and by increasing the productivity at all levels of the organization."

The use of a machine digital twin also reduces the time of setting and of the commissioning, allowing the anticipation of tests, simulations and new design solutions even before creating them. Moreover, the exchange of data between virtual and real model allows to calibrate and strengthen the diagnostic skills for an efficient strategy of ordinary and predictive maintenance. The sales engineering and the training of the staff too take advantage of this, because it can be carried out by using the digital twin instead of the real machine.

Among the technical features of the new APG-S DT centerless grinding machine we must stress the mineral casting frame, the ability to grind pieces from Ø 1,5 to 70 mm; hydrodynamic spindle on grinding wheel of Ø 610 x L 250 mm; motor power of 30 kW for peripheral speeds up to 63 m/s; control wheel of Ø 305 mm with torque up to



The Ghiringhelli grinding machines are suitable for many sectors such as automotive, bicycles/motorcycles, aerospace, bearings, electric motors, textile, electrical tools / tools and precision mechanics

11 Nm; CNC with "multi touch" screen 22" on adjustable control panel; integration of the Siemens "Safety Integrated Plus" module; Siemens IO-Link and PLC Simatic S7-1500F communication protocol which is ten times faster of the previous PLC.

The new APG-S DT is suitable for many sectors such as automotive, bicycles/motorcycles, aerospace, bearings, electric motors, textile, electrical tools / tools and precision mechanics and allows high customization for very precise "turnkey" grinding solutions.

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The grinding wheel mount head has wheels with Ø 610 mm x L 250 mm and the control wheel mount head has wheels of Ø 305 mm x L 250 mm

# Modification of the surface structure of gears

Demands placed on today's automotive transmissions include, among others, low gear noise levels (NVH), weight reduction, fuel economy, increased longevity, and high power density.

Modifying the surface structures and flank geometry leads to higher transmission performance in line with these demands. Continuous generating grinding can contribute to higher transmission performance in several ways. This article touches on two relevant properties that generating grinding contributes to ground gears, and by extension, to the entire transmissions. Polish Grinding and Low Noise Shifting (LNS) positively alter the surface structure to limit the levels of noise generation.

## Polish grinding

As emissions and fuel efficiency are becoming more stringent in all significant markets, automotive companies are facing enormous technological and economic challenges to comply. These requirements can only be met by improvements in all aspects of motor vehicles, and specifically to



Above and below: Grinding and polishing section of 2-zone grinding worm



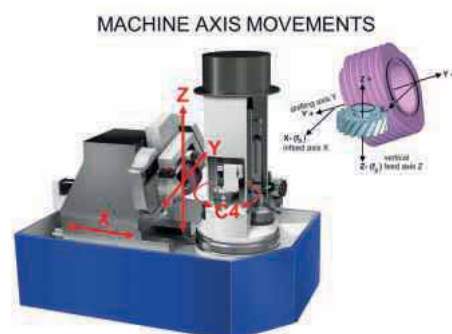
the powertrain, i.e. the engine and the transmission. Continuous generating grinding is an established process for the hard finishing of gears and can contribute to mitigating some of the challenges mentioned. Polish grinding reduces the friction of meshing gears and also increases

the bearing ratio of gear flanks. For these reasons, transmissions can be made more energy efficient. The established continuous generating method is the base technology for the polish grinding process, which is very distinct from the vibratory superfinishing used in many non-automotive applications. Without interrupting the gear grinding cycle, polish grinding is performed as a final machining sequence on the manufacturer's existing continuous generating gear grinding machines while the workpiece remains clamped on the part holder during both grinding and polish grinding. As a general rule, polish grinding consists of one polish grinding pass with the resin bonded section integrated into the end section of the vitrified bonded threaded grinding wheel, which performs the grinding operation.

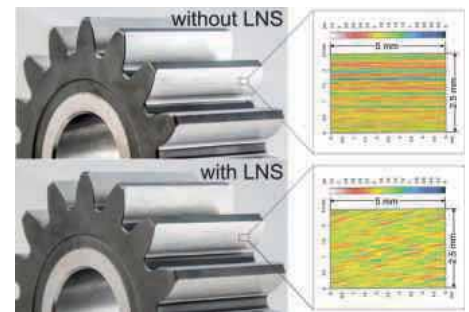
During polish grinding, only the roughness peaks are removed, reducing the roughness profile height. This method increases the contact bearing area of the gear flanks while the geometrical accuracy of the gear flanks is not affected. The polish grinding process delivers surface qualities with mean roughness values of  $Ra\ 0.15\ \mu m$  compared with the standard values of  $Ra\ 0.4\ \mu m$  used in industry on continuous generating grinding machines. It is important to note that  $Ra$  surface values are only of limited utility and that the reduced peak height ( $Rpk$ ), for example, is a more useful indicator of a surface's functionality.

## Low Noise Shifting (LNS)

Reishauer invented this process as early as 1986 and has steadily improved on it. LNS is an additional machining movement within the grinding kinematics of continuous generating grinding. As LNS runs



Kinematics and axes layout of continuous generating grinding



Gear surface structure without and with Low Noise Shifting (LNS)

unobtrusively in the background of the grinding process, most users are unaware of the existence of this feature. The machine's software automatically defines and sets LNS parameters. In principle, the kinematics of continuous generating grinding can be understood as a worm drive with additional abrasive machining properties, consisting of an infeed  $X$  to set the depth of cut, a vertical feed-rate  $Z$ , and the lateral shifting motion  $Y$  that ensures that the abrasive worm shifts continuously sideways by a small amount for each mm of vertical feed-rate.

In this manner, the grinding always takes place with fresh, unused abrasive grits. The operator defined shifting motion  $Y$  is used for the roughing stroke, whereas the machine defines the LNS shifting motion and applies in the finishing stroke. A so-called shift jump ensures the most economical use of the grinding worm by reusing grinding wheel sections for roughing that have previously been used for finishing. Continuous generating grinding creates grinding traces of a uniform axial waveform across the gear flank in the direction of the lead. Since the orientation of these waveforms is at right angles to the plane of rotation, this may cause high-frequency excitation during gear meshing, which vehicle occupants may perceive as unpleasant. The effect of LNS is to shorten and to reduce axial waveforms, which results in irregular surface structures that prevent the generation of tonal excitations.

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**HALL 3 - STAND 3017**



# *There is much more of Ghiringhelli than you can imagine!*



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Follow us on:



In many everyday products that you use, there is our small but significant contribution. We are talking about components, ground "within microns" by our centerless grinding machines. The Rettificatrici Ghiringhelli is aimed at the sectors of automotive, aerospace, motorcycle, electrical tools and tools wherever perfection is required.



**GrindTec 2020**

International Trade Fair for  
Grinding Technology

18 - 21 March - Messe Augsburg - Germany

**Hall 1 Booth 1038**

# TECNO.team UK to launch the new Q Grind Universal at GrindTec 2020



### Q-Grind U1000

The new Q Grind Universal performs complex and varied grinding tasks precisely and reliably. It has been designed to produce small to medium size workpieces and is available with a distance between centres of 600 or 1,000 mm and a maximum swing diameter of 450 mm in individual, small batch or high volume production.



The machine is based on the standard 'T' configuration with the base being formed by a high quality Meehanite casting, designed in such a way to ensure high stiffness and damping properties are inherent in the machine.

The Z-axis slide is a hand scraped Turcite-B coated vee and flat configuration with hydrodynamic lubrication, whereas the X-axis has a fully lubricated recirculating linear guideway with a Heidenhain absolute linear scale. Both axes are directly driven via a precision ground ballscrew by a FANUC digital servomotor, with a positional feedback resolution of 0.0001mm.



The wheel head is equipped with left and right external grinding wheels and an internal belt driven spindle all of which are mounted on a high resolution (0.0001°) continuously variable swivelling B-axis, this enables external/ internal and surface grinding operations to be performed efficiently in one setup.



The swing down dressing system, which is freely positioned along the Z-axis table, combined with the Q-Soft operating system software significantly reduces the complexity of setup and changeovers between jobs, equally the operator training requirements are kept to a minimum.

The Q-Soft user-friendly conversational software uses the latest FANUC control and touchscreen to gives all the functionality of a CNC without the complexity. The hydraulic tailstock is operated by a foot switch which allows the operator to use both hands when loading and unloading workpieces.

### About us

TECNO.team UK has been established to be a frontrunner in supplying the most advanced grinding technology to the UK's engineering and manufacturing industries. With a range of high precision grinding machines from Japan and Europe's elite, together with a strong historical partnership with Curtis Machine Tools, TECNO.team UK is able to offer customers engineered solutions along a broad spectrum of high precision grinding applications, from a single machine to the complete production line.

The UK engineering team, with the support from its Japanese and European principals, provides the highest possible level of expertise, with an award-winning reputation for our ability to provide the most innovative and cost effective turn-key production solutions.

From the showroom and application centre, based in Colchester, Essex, the UK engineering team can offer the design and development of solutions that are precisely tailored to maximise the production output and also satisfy the customer's ancillary requirements. At the concept stage, everything is considered to provide the most efficient process, from pre-process inspection to the final packaging.

With installations within the aerospace, automotive, bearing, cutting tool, defence, hydraulic, motor sport, tool and die industries, TECNO.Team is equipped with the necessary in-depth knowledge and technical experience across a broad range of high-tech applications to ensure that customers receive the optimum solution.

The focus centres on productivity gains through process and accuracy optimisation. To achieve this TECNO.team UK combines years of grinding and automation experience with its own UK engineers, local partners and a selection of world-leading grinding machine manufacturers.

The brands represented are as follows:



## AMADA grinding technology

The world's largest manufacturer of profile and surface grinding machines with grinding performance that delivers outstanding results in terms of productivity and quality, achievable accuracies down to 1µm, and surface finish to Ra 0.02

AMADA will be exhibiting the following machines at GrindTec 2020:-

**Meister G3** - Surface and Profile Grinder complete with FANUC robot loading system

**GLS** - Optical Profile Grinder

**Techster** - 106 Surface and Profile Grinder



## Favretto

Founded at the beginning of the 1930s Favretto specialises in the design and manufacture of grinding machines for flat surfaces, profiles and rotary tables, along with their related services.

Over the years, more than 20,000 machines have been produced. With these numbers, Favretto has always been considered one of the leading Italian manufacturers of grinding machines with the largest variety of products to meet the specific requirements of the user customer.

In April 2017, a new venture began between Favretto Srl and the Rosa GrindTech group with the ambition to continue to grow and

with the aim of giving a new boost to the Italian machine tool sector. This prestigious Italian company has now taken over the activities of Favretto SpA and TECNO.team are proud to represent them in the UK, as well as offering after sales service for both products as well as the new ROSA machines.



ROSA ERMANDO S.p.A. is a worldwide leader in designing and building horizontal-spindle grinding machines for flat surfaces and profiles, universal grinding machines for rails and profiles and creep-feed grinding machines.

ROSA will be exhibiting the following machines at GrindTec 2020:-

**Steel 11.7** - 1,200 mm x 750 mm x 600 mm Surface and Profile Grinder

**Steel 13.7** - 1,500 mm x 750 mm x 600 mm Surface and Profile Grinder



Japan's No. 1 in cylindrical grinding, founded in 1911, this long-established company has an unrivalled history in the world of machine tools. SHIGIYA has made a name for itself as a reliable partner for the Asian and American automotive industry. SHIGIYA will be exhibiting the following machines at GrindTec 2020:-

**GPH 30.B75** - CNC Cylindrical Grinder with hand wheel control

**GPV 10.20R** - CNC Vertical Cylindrical Grinder with FANUC Robot Loading System

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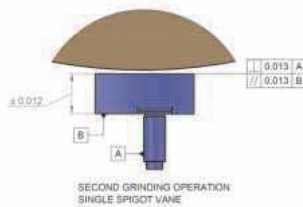
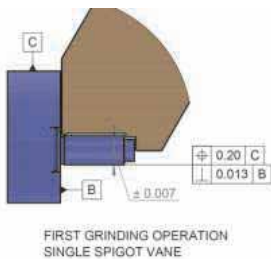


## Curtis Machine Tools at GrindTec

Following the successful launch of both the Vector Pendulum and Vector Quad at EMO Hannover in September 2019, Curtis Machine Tools, one of the leading European manufacturers of grinding machines for small high-precision components such as diesel injectors and turbocharger parts, will this year be exhibiting the following machines at GrindTec 2020:



The VECTOR TWIN & FLAT has been developed specifically for the production of single spigot VGT vanes as these require both a cylindrical and surface grinding operation. The machine is based on the already well established Vector Twin but has an additional Surface grinding station added enabling the vane to have the secondary operation complete in parallel with the cylindrical grinding operation, thus giving a component production time of under 13 seconds



All the Vector machines in the range share the same grinding platform, with a long radial stroke and a short axial stroke, for single and multi-plunge operations or peel grinding of profiles.

The grinding wheel guard houses the workpiece and rear dresser, incorporating a shutter for loading access ensuring that the grinding fluid and debris is retained within the machine. A variety of work locating and driving solutions are available, and the machine can be configured for straight or angled approach with optional in-process gauging. The machine functionality incorporates as standard a 3-axis Cartesian robot and a transitional parts storage area. Parts can be buffered in pallets using drawers or transferred in and out using linear systems. Primary and secondary processes, such as pre- and post- gauging, orientation, deburring, washing etc are all possible additions.

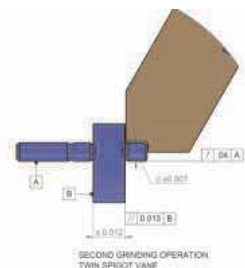
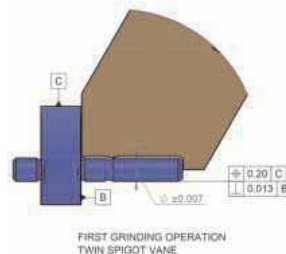
The layout enables good integration possibilities into the wider manufacturing environment, whether using manual transfer of pallets or linked linear transfer systems.

**Basic** - the core machine, with conventional workholding and Cartesian robot workpiece handling. The Basic variant has a wide application range and the greatest potential for future re-tooling for new components or applications.

**Concentric** - a centreless grinding variant incorporating a steel control wheel, work rest blade and 'concentric' pressure roller. Typically used for secondary operations on parts having a cylindrical body.



The VECTOR PENDULUM operates on a truly unique principle, with this machine, the grinding wheel oscillates between two independent workheads, each of which can be set up for different operations on the same component. With workhead inclination angles of up to 30°, the outer diameter and shoulder can be ground for small parts up to 50 mm in diameter and 150 mm in length. During oscillation from one workhead to the other, the grinding wheel can be dressed, giving the ability for the use of conventional grit grinding wheels, without the cycle time sacrifice for dressing, giving a low consumable cost, equally super abrasives can be used as the machine is capable of spindle speeds in excess of 100 m/s



**Twin** - the Vector Twin incorporates an indexing twin-spindle workhead, allowing loading and some secondary operations to be performed concurrently with the grinding process. This gives advantages when the grinding times are short and minimises the spark to spark time.

**Quad** - the Vector Quad is based on the proven Vector Twin. However, the Quad has an indexing workhead with four spindles, enabling the outer diameters or contours to be ground simultaneously on two workpieces using the same grinding wheel, doubling the output.

**GFS** - Grind from Solid, a bar fed system complete with cut-off enables parts to be ground from solid rod. Unloading can be by gravity or robot. This variant is advantageous when parts to be ground are less than 5 mm in diameter.

**Polygon** - the polygon variant uses a special workhead with a programmable 'B' axis allowing simultaneous axis interpolations facilitating the generation of forms, either cylindrical off axis or to a defined geometric profile.

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Stand: 17-320



Hall 7 - Stand 7091

# Advanced Grinding Solutions at GrindTec

Coventry-based Advanced Grinding Solutions (AGS) has eight of its principals exhibiting at this year's Grindtec show.

Comat (**Hall 7 Stand 7091**) is showcasing its range of Superfiltration Systems for all types of machine using neat cutting oil as a coolant. Today, more than 20,000 machine-tools use Comat Filtration Systems, with more than 20,000,000 litres of metalworking oil super-filtered by them every single day. Comat operates globally and has a 30-year history in developing the most advanced filtration systems that are available.

Comat's Superfiltration Technology uses continuously regenerating filtering media (diatomaceous earth, cellulose or other vegetable media), to ensure that particles larger than  $\leq 3 \mu\text{m}$  are removed from cutting fluids and that the fluid is maintained at a stable desired fixed temperature. Oil that is filtered by Comat systems does not need to be replaced and many clients report that they have never changed the oil for up to 20 years, apart from top-ups due to oil loss. AGS has already supplied a number of these units into the UK for grinding applications such as those carried out on Rollomatic grinding machines.



Rollomatic (**Hall 5 Stand 5077**) will be showing its latest range of CNC tool grinding machines such as the new NP50 machine for the grinding of cutting tool blanks. The new design of the workhead, with direct drive, offers more rigidity, finer, and more precise indexing control that is especially useful for applications requiring flat surfaces as well as for non-round punches. The roughing station has been designed to enable different wheel positions with a rotation change from  $0^\circ$  to  $10^\circ$  and  $90^\circ$  in just a few minutes. This innovation offers both a huge savings on set-up times and positions the machine as the most flexible on the market. The two



synchronous spindles make the production process very quiet and their power is increased to 14 kW and allows roughing operations to be carried out on both axes.

Rollomatic's 6-axis 830XW machine is used for manufacturing large diameter cutting tools and has a unique combination of hydrostatic guides and linear motors giving superior surface finishes on milling cutters and drills. This concept provides an exceptionally high degree of rigidity and dampens vibrations that naturally occur during grinding, thereby increasing the life of the grinding wheels and guaranteeing surface finishes and sharp cutting edges that give users a real competitive advantage. Unattended production is an additional process that has been integrated into this machine to allow long-term manufacturing without human intervention. The use of the same oil for the hydrostatic slides, cooling of grinding spindle, and coolant during grinding, allows the machine to be kept at a constant temperature and provides a remarkably high level of thermal stability, both during setup and grinding. All Rollomatic grinding machines benefit from their industry leading three years parts and labour warranty and free software updates for life.

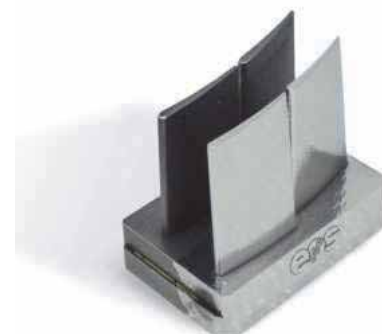
Tschudin (**Hall 7 Stand 7086**) is exhibiting its latest Cube 350 grinding machine, stated as being the world's most compact CNC centreless grinding machine. A feature on all Tschudin machines is their patented movable workrest axis (W-Axis) which allows for additional grinding processes such as the highly efficient multi part grinding of several parts at a time or to split up grinding processes in the same grinding cycle to have both a rough and also a finish grinding operation in one automatic setup. Thanks to the W-axis, the loading and unloading of the workpieces is always outside of the grinding zone, allowing

simplified and safe automation or safe manual loading. This feature is highly attractive for those looking to meet health & safety obligations, because otherwise the hand loading of parts to centreless grinding machines can be dangerous. With the machine base and the spindle blocks made from natural granite, Tschudin is mastering the worst enemy of grinding which is thermal expansion due to heat variances. The Tschudin Cube machine that has a plunge grinding capacity for parts from 0.1 to 20 mm in diameter will also be a central feature on the AGS stand at the forthcoming MACH show.



New to the AGS range of finishing and deburring machines is GPA Innova (**Hall 5 Stand 5026**). GPA has introduced the world's first dry electropolishing process, DLyte, that does not use any liquid as the electrolyte. This is a patented and unique one step automated process for grinding and polishing metals by ion transport using free solid bodies.

DLyte machines are used for polishing steel and stainless-steel, cobalt chrome, titanium, aluminum, nickel and alloys for the medical, aerospace, automotive and other industries. Unlike traditional polishing methods, the DLyte system obtains consistent finishes whilst avoiding producing any marks on the surface of





components and is able to process complex geometries without generating micro scratches on the surface. DLYte respects the tolerances of the workpiece, delivering a mirror finish without affecting part geometry. Typical applications for this process include the polishing of cutting tools, all kind of medical parts such as artificial knee joints and hip joints, and aerospace parts such as aeroengine blades.

Grinding of course would not be easy without the best grinding wheels and Krebs & Riedel will be highlighting its large range of grinding wheels in **Hall 2 Stand 2031**. Krebs & Riedel is one of the leading German abrasives manufacturers with over 250 employees and an annual turnover of 33 million euros. An export share of about 45 percent shows its international



orientation. The wide product range includes corundum and silicon carbide wheels in ceramic and synthetic resin bonds for most industrial grinding applications up to 900 mm outside diameter. Diamond and CBN grinding wheels in ceramic bonds with a working speed of up to 200m/s for internal, external and special grinding processes are also offered.

Such has been the success that Advanced Grinding Solutions had in the UK with the Krebs & Riedel wheels that it now holds over £75,000 worth of wheels in stock for the same day/next day delivery to key UK customers and this stockholding is growing as more and more engineering companies discover the advantages in improved part quality and the cost savings that the Krebs wheels brings to them.

In **Hall 4 Stand 4037**, FLP will be exhibiting several fine grinding and lapping machines whose range includes both twin-wheel double-sided CNC lapping machines and also single-sided lapping machines. The size of machines ranges from the most basic of 400 mm in diameter having three working stations up to the world's largest 100 tonne 4 m diameter monsters. FLP holds over £2.5 million worth



of lapping consumables in stock and offers end users of all types of lapping machine the largest range of wear parts and consumables. The range is vast and includes items such as: lapping and polishing oils; fine classified silicon carbide; boron carbide; special fused aluminium lapping powders; lapping and polishing fluids in water-derived concentrates with integrated rust protection; honing oils for machining steel, non-ferrous metals, hard metals and ceramic; diamond sprays, suspensions, powders and pastes with micro-grains of various specifications and grades from 0.25 µm up to 45 µm.

Gerber is showing four deburring machines in **Hall 1 Stand 1020**: the BP Smart, BS Power, BP MX and the new CompactPolish machine. The technique of brush honing 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. For simple shapes, nylon brushes impregnated with abrasive grit are used. A different approach is used for parts with more complicated shapes or with higher requirements on the quality of the surface polishing. Here brushes are made from natural materials and a special diamond

paste is applied. Both single-sided and double-sided deburring is catered for from simple stand-alone machines to ones with full automation.

In **Hall 3 Stand 3094** you will find Platit, a leading manufacturer of highly advanced coating machines that are based on plasma generating PVD technology (Physical Vapour Deposition). One of the main applications for Platit coating machines is the coating (usually TiN, TiCN, CrTin, etc) of cutting tools (end mills, form tools, and drills), also inserts, saw blades, hobs and broaches. Here Platit leads the way in offering cost-effective solutions that means that tool manufacturers can now easily coat



their own tools and cutters instead of relying upon expensive subcontract solutions. Platit does much more than just building coating machines, however. It is constantly developing new coatings for its customers' needs and offers a full consultancy service for end users to ensure that they are using the optimum coating for their application. The machines themselves are very user friendly and are extremely versatile.

AGS will have staff on hand throughout the Grindtec show to meet UK engineers and more information is available at [www.advancedgrindingsolutions.co.uk](http://www.advancedgrindingsolutions.co.uk)

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# Fire protection for grinding machines

Kraft & Bauer, whose fire-fighting systems protect more grinding machines than any others, will be exhibiting at Grindtec 2020.

Many of the world's leading OEMs of grinding machines fit Kraft & Bauer fire systems including Rollomatic, Walter, Tschudin, and Bahmuller with several thousand systems being sold every year.

Kraft & Bauer UK supplies major machine tool manufacturers and distributors with these fire protection systems, as well as providing a full retrofit and service support facility for its UK customers from its base in Coventry, with the same day availability of all parts being guaranteed. It also offers a same day/next day swap system for discharged CO<sub>2</sub> and Argon gas bottles.

All end users of grinding machines are warned to check to ensure that the mandatory annual servicing of their machine tool fire systems has been carried out and that service certificates are kept to ensure compliance with health and safety regulations. Service checks must be carried out by a trained and certificated engineer and records kept accordingly. Insurance

companies check to ensure that fire systems on machines have been serviced annually and its highly unlikely that they will pay out if any claim is made without having service certificates available.

Kraft & Bauer UK will be present at the Grindtec show to meet UK engineers to discuss fire protection for machines of all kinds. While grinding machines are a major application, many more systems are fitted to leading turning machines such as those manufactured by Index, Traub and Tornos.

Any machine considered a fire risk that uses oil, or any kind of potentially flammable liquid, such as an oil-based coolant, or produces a spark or similar such as an EDM machine or a laser machine, needs to have fire protection, as does any machine that although being used "dry" (without coolant) is machining a self-combustible material such as titanium or magnesium alloys.

Additional information on fire detection and extinguishing systems for machine tools and the legal responsibilities of manufacturers and end users is available from Kraft & Bauer's UK website.



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**HALL 1 - STAND 1017**

# Stahli lapping technology at GrindTec

Swiss machine builder Stahli Lapping Technology Ltd will present its machines and services at Grindtec 2020.

This year, alongside its existing well-known machines, Stahli will present its FH3-505 three-wheel flat honing machine with a new top mounted robot-automation concept. The new three-wheel machines in the FH3 series unite the usual quality of the Stahli flat honing machines with shortest change over times between cycles and the possibility to automate the machine with minimal effort. This combination touches onto the speed of through-feed machines without compromise on the flat-honing quality.

The FH3 provides short changeover times of less than 15 seconds between cycles with its two lower tables including flat honing wheels, pin rings and the central swivelling unit. One unit is coupled with the machine and grinding together with the top wheel, while the other one is openly accessible for pick-and-place automation. Once the machining cycle is finished and the automation has exchanged all ground

workpieces with raw ones on the outer wheel, the combination will swivel 180° and a new cycle is started. In comparison to classic exchange of 10-12 carrier discs on a double-sided machine, this system saves more than one minute per cycle. In the case of a 2-3 minute process, this will provide a >30 percent productivity advantage for the customer. This is true for comparison with manual and automated classic systems.

Naturally the carrier discs have to be loaded at high speed to support the high machining rate. With average sized parts, for example 10 parts per second per carrier, six carriers, average stock removal and one robot a realistic target is around 2-3 seconds per part. A flexible robot solution, which can be paired with a belt conveyor system, or similar, will be shown by Stahli at the show.

With Stahli flat-honing / fine-grinding, usual stock removal is around 100-400 microns from raw stamped, turned or hardened steel workpieces. Stock can however be much higher, with some forged steel workpieces even having to be ground down more than 1 mm. With the right CBN



diamond wheel, this can be done in short time with up to 4 µm per second stock removal rate on the full surface of multiple parts at a time. Flatness reaches below 1 µm depending on the size and stability of the workpiece itself, parallelism usually around 1-2 µm.

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**HALL 4 - STAND 4039**

## The Masters of grinding solutions

Midlands-based Master Abrasives will be exhibiting the full range of Master® products at the 2020 GrindTec exhibition alongside its sister company, Master Abrasives Polska.

Representatives from both companies will be available on from 18-21 March to talk about the complete range of abrasives from the Master brand and how these products can improve productivity in various applications. Products being exhibited include high-quality grinding wheels and a brand-new range of heavy duty (HD) burrs.

The new Master HD cut burrs are ideal for working on aluminium and non-ferrous materials. They give excellent stock removal, are good for blending cast lines and have a low-vibration, smooth running performance. This range will be stocked in a range of suitable sizes and will be available to view on the stand at GrindTec.

Master Abrasives have been experts in grinding solutions for many years and its display of grinding wheel options at GrindTec will be tailored to a variety of industries including aerospace, oil and gas and automotive. It offers a full range of

grades in vitrified and resin bonds and specially designed products such as SAWPRO grinding wheels for cool cutting action when sharpening circular saws.

Paul Batson, managing director of Master Abrasives, comments: "Since exhibiting at GrindTec in 2018, we have rebranded all our brochures including our Master brand brochure to fit our modernised brand and these will be available for visitors to take away. I'm confident that we will come across even more opportunities this year to make the Master brand even better known internationally."

Now with a sister company set up in Poland, Katowice, Master Abrasives can offer even better solutions for industry to manufacturers in Poland. Slawomir Klisiewicz is leading the new company in Poland as national sales manager. He has many years of experience in the abrasives industry and will be available to discuss customer requirements at GrindTec 2020. He is also responsible for the organisation of sales and logistics as well as cooperating with new and existing customers in Poland.



Paul Batson concludes: "After over 50 years of successful trading, we have the experience needed to match the application with the most effective process and products. We have used our knowledge to develop the products in the Master brand, which is now recognised internationally for high-quality abrasives. We look forward to working with new potential distributors on helping customers to improve productivity in other parts of the world following the GrindTec show."

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**HALL 5 - STAND 5122**

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# The filtration specialist

Advanced Grinding Solutions has announced the sale of a number of Comat filtration systems that are linked to Rollomatic Tool Grinding machines

Comat designs and manufactures super filtration systems that deliver a filtration quality of under 3 µm throughout the entire working cycle, thus maximising the quality of parts produced on machine tools while minimising lifetime running costs and maintaining maximum coolant consistency.

Comat systems can be customised to meet specific client's needs allowing for maximum efficiency of the filtration process and oil is actually filtered to a better quality than new unused virgin oil on Comat systems.

The remote monitoring of the performance of the filtration systems from its HQ near Milan in Italy ensures effective after sales support with systems being monitored in real-time during manufacturing processes and customers' filter systems fine-tuned by Comat to ensure that the optimum filtration quality is obtained at all times.

Today, more than 20,000 machine-tools use Comat Filtration Systems, with more than 20,000,000 litres of metalworking oil super-filtered every single day. Comat operates globally and have a 30-year history in developing the most advanced filtration systems that are available.

Comat's Superfiltration Technology uses continuously regenerating filtering media (diatomaceous earth, cellulose or other

vegetable media), to ensure that particles larger than 3 µm are removed from cutting fluids, while the fluid is maintained at a stable desired fixed temperature. Oil that is filtered by Comat systems does not need to be replaced and many clients report that they have never changed the oil for up to 20 years, save top-ups due to oil loss.

Main applications for these filter systems are on grinding machines, superfinishing and lapping machines, but there are also many other applications on automatic lathes and machining centres of all kinds.

Comat filtration systems ensure a higher and more consistent quality of machined components, increased lifetime of cutting fluids, reduced machine wear and importantly bring about an increased lifetime of grinding wheels and cutting tools.

From small stand-alone systems to support a single grinding machine with a capacity of 60 l/min up to centralised units that can cater for up to 13 grinding machines (or 45 lathes in special



applications) with a capacity of over 800 l/min, Comat has many solutions.

Cost studies have shown that Comat systems are considerably cheaper to run than other systems that use very expensive candles or a series of cartridge type filters whose running costs are up to four times greater. In order to cope with flow-rate issues other filter unit suppliers recommend the use of only specific brands of oil or recommend low viscosity oils. Comat systems can operate with any oil having a viscosity ranging between 5 and 30 Cst at 40° C (104° F).

The reliability of Comat filtration systems is excellent and Comat systems require little to no maintenance if correctly operated. Certain customers have been operating these systems for 20 years without ever calling for assistance. Basic ordinary maintenance easily be carried out by the operator and some end-users have never replaced the filter discs in the filter vessel. However, Comat recommends inspecting them every ten years, so that no internal parts of the filter are subject to specific wear and tear.

For additional information, contact:

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## Full-line supplier VOLLMER to introduce its key trio at GrindTec

At GrindTec 2020, VOLLMER will be presenting itself for the first time as a full-line supplier. VOLLMER is now expanding its range of machines for rotary tool production across the three fields of grinding, eroding and laser machining.

Receiving its exhibition World Premiere in Augsburg, VOLLMER will be introducing the laser technology of the new VLaser 270. In addition, around a dozen grinding and erosion machines can also be seen live at VOLLMER in Augsburg. These will include the VGrind 340S, the VGrind 360 and VPulse 500, as well as the CHX 840, CHD 270, CHP and CHF 840 models for circular saw machining. The trade fair appearance of the 111-year-old machine manufacturer will be rounded off with the company's innovative range of services, training and IoT applications.



At GrindTec 2020, VOLLMER will be presenting itself for the first time as a full-line supplier for machining tools, circular saws and band saws, and will be showcasing machines that use the three sharpening technologies grinding, eroding and laser machining

VOLLMER develops sharpening machines and automation options for precisely machining cutting tools made from carbide and tipped with PCD (polycrystalline diamond). The latest innovation is the exciting new VLaser 270 laser machine. The machine will be introduced to visitors for the first time at GrindTec and is destined to be one of the highlights of the show. Using the power of the laser light and linear drive technology, PCD-tipped tools can be precisely machined with the VLaser 270.

VOLLMER will be bringing around a dozen sharpening machines and automation solutions to GrindTec that relate to eroding and grinding technology. The VPulse 500 and QXD 250 wire erosion and disc erosion machines will be on show, as well as the VHybrid 360 combined grinding and erosion machine. Tool manufacturers can use the VHybrid 360 to both grind and erode carbide and PCD tools such as drills, milling cutters or reamers in a single setup. Three models from the VGrind family will also be on show: The VGrind 360E basic model, the VGrind 360 and the VGrind 340S with linear drive for machining extremely small carbide tools. With two new optional features, the VGrind 360 optimises productivity for tool manufacturers. Due to a higher processing speed, the material removal rate can be significantly increased whilst the simultaneous replacement of grinding wheels and tools significantly reduces non-productive time.

Machines for machining carbide-tipped circular saw blades are

traditionally well-represented at the VOLLMER GrindTec stand. The CHX, CHP, CHF and CHD machines offer some of the industry's best-selling technology. Whether in production or reshaping, the completely automated and CNC-controlled sharpening machines can be found wherever wood, metal, aluminium or plastic have to be cut to a precise size with circular saws.

### Service package and digital services

VOLLMER will also be providing information regarding its service package for training, finance, maintenance and repair. With the digital initiative V@dison, the full-line supplier brings together applications for Industry 4.0 and IoT (Internet of Things) to connect people and machines. The "Visual Support" app provides an innovative new access path, which offers VOLLMER customers the opportunity to connect directly with the VOLLMER help desk. Installed on a smartphone or tablet, the app supports the machine operator online, allowing them to take and exchange live pictures of a machine using the video function. VOLLMER will also explain how end users can connect various machines with each other via the IoT "umati" platform. The umati platform is based upon the OPC UA protocol that was developed by the German Machine Tool Builders' Association (VDW), together with around 50 machine manufacturers.

### Loroch celebrates its 120th anniversary

VOLLMER subsidiary Loroch, based in Mörlenbach, will also be represented at GrindTec. The company is celebrating its 120-year anniversary this year. Various Loroch automatic saw blade sharpening machines can be viewed on the VOLLMER stand, including the CNC-controlled PowerStar 850 sharpening machine and the fully automated K850 M evolution and KSC 710 models.



VOLLMER subsidiary Loroch will be celebrating its 120-year company anniversary at GrindTec and will be showcasing various automatic saw blade sharpening machines at its trade fair stand

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**HALL 1 - STANDS 1006/1027**



## Precision and high production centreless grinding solutions

Danobat's premise is to offer innovative solutions to help customers meet the challenges posed by their markets and be more competitive. Production and precision requirements continue to become tougher, but industrial firms are calling not just for more and better manufacturing but also for greater versatility and automation to make them more competitive on the market.

### ESTARTA range

Danobat presents the range of ESTARTA centreless grinders, a family of solutions intended for the toughest production work, guaranteeing flexibility and precision without neglecting the customisation required for turnkey projects and adaptations to the specific needs of each customer.

The machines are designed to meet the most critical manufacturing demands, in both throughfeed and infeed, with a particular emphasis on the absorption of the typical vibration encountered in this type of grinding technology. The main advantages of this solution are its high precision and great rigidity, increasing our customers'

productivity by at least 30 percent, while guaranteeing the required quality. This range of machines is capable of operating at high speeds (120 m/s) for applications where this technology is beneficial.

Moreover, the different models offer solutions covering different applications where both high productivity and quick reference change are a priority. The capacities of this range are: pieces with a maximum diameter of 250 mm and a maximum length for infeed grinding of 650 mm.

In an application for centreless grinding machine of manufacturing components for electric bicycles, three parts are ground per cycle, giving a high rate of productivity. In addition, different diameters are ground in each part, with IT4/5 tolerances. All these factors make machine stability and rigidity essential. The profiling system, fitted with linear motors and linear scales, helps achieve a very precise wheel profile, ensuring that the required tolerances are met. It is a fully automatable machine with a feeder with a high rate of autonomy.

The grinding machine is fitted with linear



motors, a granite bed and a workhead with a supplementary support which does away with the need for a cantilever head. The solution also includes a rolling guide system, which gives it greater motion sensitivity. This feature makes it possible to do without any hydraulic component. This makes ESTARTA an ecologically sustainable grinder, requiring less consumption and maintenance. The machine has a fixed workstation. The loading and unloading position remains fixed, greatly simplifying machine adjustment and reducing operator intervention.

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# Saint-Gobain Abrasives showcases grinding tool innovations at GrindTec

Saint-Gobain Abrasives, the world's leading manufacturer and supplier of performance abrasives, will present its latest grinding tool innovations from its Norton and Norton Winter brands at this year's GrindTec. The highlights at the show include Q-Flute EVO, the next evolution in flute grinding and latest addition to Norton Winter's Q-Flute series. Other key topics of the fair include high-performance solutions designed for the grinding of engine and gearbox components and the manufacture of components for the aerospace industry.

The company will also be demonstrating the advantages of its high porosity abrasives and presenting a selection of products specifically designed for a variety of applications from grinding and dressing to finishing and polishing across six key markets: Tools, Gears, Aerospace, Bearing, Automotive and General Engineering. With a full range of products, Saint-Gobain Abrasives supports these industries with the latest technology to reduce costs while delivering improved performance.

### High performance technologies



Norton Winter's new flute grinding wheel, Q-Flute-EVO combines the benefits of the proven Q-Flute2 and Q-FluteXL family to offer a unique combination of free-grinding properties and profile stability. Q-Flute-EVO can reduce grinding forces by up to 20 percent compared to its competitors, while providing greater edge stability at the same time. The high grinding quality is reflected in the excellent surface quality of the grooves.

In combination with Norton Winter V-PRIME diamond grinding wheels for pointing and clearance angle grinding, the user has access to a perfectly coordinated system solution that guarantees outstanding productivity in round tool production.

Another key focus of the Saint-Gobain Abrasives stand is the grinding of engine components. With the Norton Winter VITRON7 ceramic bond, the company is improving performance in many

applications for external and internal cylindrical grinding. Users benefit from significantly longer dressing cycles, higher efficiency and output quality which ultimately contributes to significantly reduced grinding costs.

Combining a Norton Winter CarbonForce base body with VITRON7 technology enables the production of particularly large grinding wheels as well as multi-track wheels, making VITRON7 a scalable solution.

Significant production leaps in the mass production of engine components are also possible with the new electroplated, dressing-free Norton Winter AEON high-precision grinding wheels. The high-strength ductile nickel bond allows large grain protrusions of the CBN or diamond grain specifications with extreme retention force. Single-layer AEON grinding tools are so powerful that they can push the performance of modern grinding machines to the limit and in some applications even replace competing machining processes such as turning.

### Cool grinding in hot zones

Norton Quantum X grinding wheels combine three of the very best Norton technologies, Quantum, Vortex2 & Vitrium3, to bring high value and performance to a range of industries. This highly porous wheel delivers high material removal, exceptional cool grinding and reduced cycle times and has been specially designed to efficiently grind difficult to machine materials in heat and stress sensitive processes, such as the aerospace industry.

Norton Vitrium3 will appear on the stand, as part of the Tools and General Engineering showcase. Vitrium3 features exclusive chemistry that promotes grain adhesion and allows for increased porosity. An improved holding power and reduced bond-to-abrasive ratio exposes a larger grain surface area, enabling the wheel to cut more freely to improve cut rate. This reduced bond-part interaction also



minimises heat build-up to reduce burn and power consumption and requires lower grinding forces on the part to improve quality. Thanks to the superior grain holding properties, wheel form and corner holding is optimised to reduce dressing time, dresser wear and dresser replacement requirements. The bond also provides the ultimate wheel strength with lighter construction so machines can work at higher feed rates, speeds and pressures, significantly increasing production with existing equipment.

### Optimised gear grinding

Norton Abrasives has introduced a platform for engineered gear solutions, Norton Xtrimum. This platform removes a number of sub-brands to streamline the product portfolio and offer a single, simplified solution to customers. The range has also been expanded with the addition of a new dual worm grinding product, further enhancing Norton's capabilities in the gear grinding market.

To find out more about all of Saint-Gobain Abrasives' grinding tools and experience a number of informative practical demonstrations, visit the Saint-Gobain Abrasives stand at GrindTec.

Alternatively, contact:

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**HALL 1 - STAND 1019**

# Swiss precision on show

SCHNEEBERGER Maschinen AG will present at GrindTec its innovative range of machines, software, fast robotics and finest mechanical engineering in the field of tool and component grinding.

The new NGx machine generation is now complete. Five basic types complement each other in terms of machine size, grinding power and variety of options. They all have in common an optimised structural rigidity, yet a sporty weight for dynamic applications. Each machine comes with a T-slot table, which accommodates numerous options, dresser, tailstock and steady rest can be configured individually.

The latest release of the Qg1 CAD/CAM software includes prismatic and rotary thread rolling tools, a new design approach for drill-flutes, new methods for the combination of standard tools with profile and STEP elements.

The Toogle tool database comes with a number of interesting samples for each application group. Standard tools are listed very comprehensively, so that a new

grinding task can usually be solved by automatically searching for similar tools and interpolating specific dimensions. With each individually adapted or completely new created tool, the personal database grows. Toogle guarantees a perfect order and organisation of virtual tool cabinets.

Grinding professionals will be delighted by new features such as the import of 3D-STEP models or grinding path optimisation down to the detail. All this is possible thanks to consistent programming, based on geometric 3D models.

GrindTec visitors can experience the Qg1 large range of software features and unique user-friendliness. A super large touch screen is available, with grinding experts from SCHNEEBERGER on hand to answer questions.

SCHNEEBERGER grinder's connectivity brings production close to the ideals of Industry 4.0. All six machines shown on the SCHNEEBERGER stand will be connected. It will be demonstrated how easily machine status and achieved productivity can be



checked online, via smartphone browser or by notification via various channels.

**HALL 3 - STAND 3076**

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## On the wings of Hi-Tech

by Claudio Tacchella

Who has never admired an airplane in flight? Every day the sky is crossed by about 25,000 civil aircraft. However, few people know that almost 80 percent of these were built with the contribution of the Italian industry. Among these, AZ SpA of Thiene (VI), manufacturer of special large cylindrical grinding machines, has always stood out for its ability to deal with and solve technical issues, even complex ones, offering very flexible and customised solutions to the individual customer's needs.

The company has over 40 years of experience in the sector and has always had an international focus, with an export share of over 95 percent and more than 3,000 grinding machines delivered and operating in more than 80 countries worldwide.

AZ SpA has been able to gain worldwide leadership success thanks to the high quality and performance levels of its products, the result of high professionalism and engineering creativity able to grasp and often anticipate market demands.

The sectors on which AZ SpA focuses are those in which top technology excels. Among these, the aerospace sector, in particular, is in constant evolution and expansion and related ones, where the



The tailstock has hydraulic constant pressure controlled by load cell

complexity and the required precision of the pieces to be worked, enhance the characteristics of AZ systems.

AZ SpA has an impressive modular range of grinding solutions designed specifically for the aerospace industry called "AZ-Aerospace" for the manufacture and maintenance of components of aircraft engines, turbo spindles and landing gears.

All grinding solutions are studied,

designed and tested together with the customer with maximum flexibility and customisation to meet and solve the needs that are required.

The numerous lines available comprise the RUA, RUX, RU and RUG universal grinding machines for external and internal diameters as well as more specific grinding machines for technical issues to be worked on such as the AKP range for landing gear



The AZ-Aerospace line is a range of special grinding machines for the aerospace industry

grinding machines with gap bed, the range of GSB internal landing gear grinding machines, the LBC range for landing gear orbital grinding machines for external and internal diameters or for asymmetrical heavy parts with rotating table.

The AZ-Aerospace range uses the most advanced mechatronic solutions, are all customisable, energy efficient, safe, reliable and comply with Industry 4.0 requirements.

Measurement systems, motors, drives, as well as machine mechanisms and applied CNCs, are selected from the best brands in the world and, in conjunction with the AZ engineers' creativity, produce one of the most sophisticated range of products today on the market.

The grinding process has the following functions to give to the operator an automatic and safe working cycle: electronically variable spindle speed; GAP control; dressing control, wheel balancing control, in-process control, CRASH control and control of diameters from CNC. This provides the machine with the possibility to reach unbelievable performance on accuracy. In addition, Wikicam is a monitoring system that allows to control remotely some parameters of the CNC machine.

There is also a live video streaming solution built-in, to monitor what the machine is doing in real-time. The connection to the builder's headquarters is made by a high-strength secure encryption algorithm, using a VPN.

The machine base has been designed with FEM analysis and has a special composital

technology structure that reduces the elasticity coefficient, guaranteeing an exceptional absorption of vibrations, great machine rigidity, stiffness and high dynamic performance. The machine axes slide on high precision recirculating linear guides.

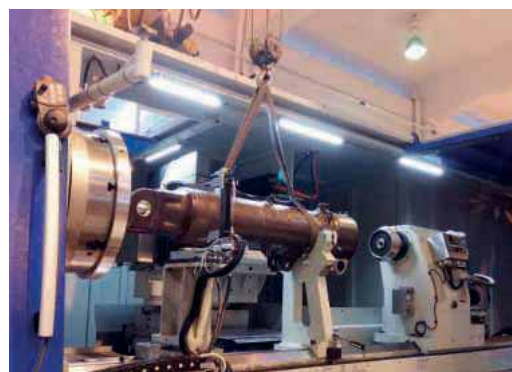
Normally, the grinding machines conform with the grinding wheelhead mounted on the main Z and X overlapping and crossed axes and with fixed longitudinal workpiece table. This axis scheme allows for large operating capacity with reduced dimensions on the ground. Different wheelhead configurations are available (wheel diameter range from 508 to 760 mm) which can be fixed or rotating manually at  $\pm 20^\circ$ , or automatic with B axis at  $\pm 30^\circ$  or  $\pm 360^\circ$  and are equipped of a plurality of spindles for external and internal grinding processes. All this allows configurations with straight, angular, internal wheels and B-axis which is driven by an integrated torque motor.

There are also the most innovative solutions for silicon carbide, corundum, CBN and diamond grinding wheels allowing the grinding of all aerospace materials, metals and their alloys including chromium and in particular those subjected to the most innovative systems for thermal spray techniques, such as H.V.O.F. (High Velocity Oxygen Fuel).

The headstock with spindle power from 2.3 to 3.6 kW can swivel manually or automatically and is designed to use



AZ grinders can be equipped with a wide range of wheelhead configurations: straight, angular, internal and B-axis



All grinding solutions are studied, designed and tested together with the customer with maximum flexibility and customisation

different clamping systems in accordance with the specific workpiece. The tailstock is equipped with conicity (taper) adjustment with continuous control of the force between centres.

As an indication, some operating capabilities on the AZ-Aerospace range are: on the RU line the distance between centres from 1,000 to 6,000 mm, swing over table from 400 to 1,200 mm; on the GSB line max internal grinding diameter 350 mm and on the AKP line max swing on the gap 3,600 mm.

AZ engineers will be available on the stand at GrindTec to illustrate all the technical characteristics and provide all information on the new AZ-Aerospace range.

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**GrindTec: HALL 5 - STAND 5094**



The machines produced by AZ perform the most advanced mechatronics solutions for landing gear grinding



# Fast and efficient automated blisk surface finishing comes to the UK

Since their inception for helicopter engine compressors in the 1980s, blisks (bladed disks or IRBs, integrally bladed rotor blades) have become an increasingly important feature of turbo-fan aerospace engines. Extreme heat, pressure and the erosive effects of fine particles drawn through the compressors at high speed are just some of the operational environmental conditions they need to withstand.

## Blisks boost engine efficiency

Combining rotor disks and blades as a single part reduces components in the compressor removes a potential source of failure where blades would normally attach and also increases overall engine efficiency. This latter point is significant as reducing fuel consumption is a key driving factor for the aerospace industry as airlines continue to improve their environmental footprint while controlling costs.

Blisks are often produced by CNC engineering. However, this process is now complemented by the rapid development of additive manufacturing. 3D printing saves wasted material associated with CNC machining a blisk from a solid block of metal, usually titanium or a nickel-based alloy. Additive manufacturing also increases design flexibility and aids rapid prototyping. However, both CNC and AM manufactured blisks still require post processing to produce the final surface finish at the desired tolerances.



Long with smooth airflow surfaces, blisk performance greatly depends on a precise and uniform blade profile, especially along the leading and trailing edges

## Challenges of surface finishing blisks

Surface finishing a whole blisk is more difficult than individual turbine blades. The first issue is the overall size and complexity of a full blisk compared with a single blade. The second critical factor is blade performance. Along with smooth airflow surfaces, performance greatly depends on a precise and uniform blade profile, especially along the leading and trailing edges. Any surface finishing must ensure this profile is retained or, as is more usual, taken to a level of perfection not achievable by the original manufacturing method or additional processing such as costly and variable finishing with hand operated power tools.

## Machines for blisk finishing

For individual turbine blades, highly controllable stream finishing machines from OTEC Präzisionsfinish can smooth surfaces to required values of  $Ra < 0.2 \mu m$  in minutes and even achieve  $Ra < 0.1 \mu m$  in a little more time. During the process, a minimal amount of material is removed evenly from the surfaces, achieving effective smoothing and precise edge rounding, simultaneously, without altering the profile. With up to five blades mounted in a OTEC stream machine,

the time to produce a target finish can be as little as three minutes per blade and is reliably repeatable.

For whole blisks, Fintek is bringing to the UK The Intelligent Polishing Systems (Haug Intelligente Poliersysteme) INNO series. Like OTEC, IPS is another innovative surface finishing machine/process producer. Sharing the same German high value engineering ethos, the company is able to produce machines of bespoke design for specific applications and that includes full automation and industry 4.0 capabilities.

The INNO series from IPS is a vibratory isotropic super finishing process optimised for the surface finishing and polishing of whole blisks up to 950 mm in diameter. Fully compliant with existing aerospace approved isotropic processes, versions of INNO are available for manual operation or can come complete with Siemens PLC control for full automation and integration into large-scale manufacturing systems.

Handling a blisk is more problematic than a single blade, so IPS has developed a special pneumatic extendable mandrel to greatly speed loading and unloading the blisk from the process bowl. Once lowered in the bowl, the abrasive effect of the



The standalone INNO series from IPS - a vibratory isotropic super finishing process optimised for the surface finishing and polishing of whole blisks up to 950 mm



process media is controllable, driven by two vibratory motors. The flexible adjustment of the unbalanced motors allows for the granulate movement to be modified to act on all airflow surfaces of the turbine blades, while ensuring the all-important blade profiles are not compromised. The process is supported by the addition of high gloss compound or water.

#### Accommodating Industry 4.0 and bespoke manufacture

With extensive Industry 4.0 capabilities, the INNO series is perfect for new production

lines or as a plug-in upgrade for ageing vibratory machines. Smart factory interface connections enable full automation and quality control through data acquisition and monitoring, including detailed track and trace information, this makes them ideal for inclusion in aerospace manufacturing cells of any size.

While a range of single and standard machine configurations are available, including an additional machine enclosure, IPS excel at working with customers to produce bespoke 'specials' engineered to accommodate unusual load specifications or

automated production requirements. Rooms with networked systems can be specified with conveyor feed and automated robot loading and unloading to further speed production. Vibratory systems are relatively noisy, so control rooms can be sound dampened to create a more pleasant working environment.

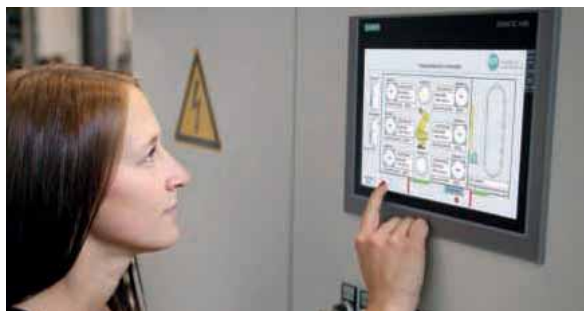
To find out more about OTEC stream finishing machines for turbine blades or IPS INNO for blisk finishing, visit Fintek at



The SF4 stream finishing machine from OTEC is capable of smoothing individual turbine blade surfaces to values of  $R_a < 0.2 \mu m$  in minutes

MACH 2020. Fintek also offers extensive subcontracting surface finishing services.

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Rooms with networked systems can be specified with conveyor feed and automated robot loading and unloading to further speed production



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# Environmentally compliant surface cleaning with maximum performance

SAFRAN Nacelles switches from traditional solvent delivery to COMPLEASE Chemical Leasing with DOWPER MC Perchloroethylene

Chlorinated solvents are essential to achieve the desired results in numerous precision surface cleaning applications, especially in the aerospace industry. However, many manufactures are evaluating alternatives as did SAFRAN Nacelles Ltd in Burnley. In order not to jeopardise cleaning quality, the nacelle manufacturer decided for DOWPER™ MC Perchloroethylene and COMPLEASE™, the chemical leasing model from SAFECEM. It helps to ensure that the highest requirements to both component cleanliness and health, safety and the environment (HSE) are met.

At the same time, the service-oriented leasing model provides process optimisation to reliably produce top products. SAFRAN Nacelles, a member of the SAFRAN Group, is one of the world leaders in nacelle integration and the only manufacturer that offers solutions for different market segments, from business and regional jets to the largest commercial airliners. In addition to technical and financial performance, protection of HSE are important corporate objectives.

In the framework of SAFRAN's HSE programme, SAFRAN Nacelles adheres to strict environmental protection rules based on ISO 14001 norms, with strict audits of SAFRAN Nacelles facilities.

## HSE - the main driver to a new cleaning solution

At the site in Burnley, Lancashire, the company manufactures among others the Trent 900/GP 7200 nacelle and thrust reverser for the Airbus Aircraft A380.

Manufacturing capabilities include production of complex sandwich and monolithic composites, sheet metal stretch forming and final assembly. A critical step in the composite production process is the reliable removal of contaminations such as grease prior to the subsequent adhesive bonding process.

Even though retaining solvent cleaning was seen as a challenge, with COMPLEASE Chemical Leasing SAFRAN, Nacelles has implemented a solution which supports the



company's aims regarding HSE and product quality. The chemical leasing model developed by SAFECEM allows the company to benefit from solvent cleaning for an all-inclusive monthly fee.

"COMPLEASE enabled us to capture a number of critical requirements under one easily managed package. It helps to meet all our requirements to HSE and provides us with expert consultancy and industry know-how," explains Stephen Ingham, facilities and capital assets engineer at SAFRAN Nacelles.

## Considering alternatives

Aqueous cleaning was, as in many cases, the considered alternative. However, the evaluation showed that more complex part geometries and the composite items, i.e. aluminium honeycomb, require vapour degreasing to achieve the necessary cleanliness. An additional initial investment and much higher operating costs finally convinced the management of SAFRAN Nacelles and SAFRAN that a variety of components manufactured at Burnley were cleaned efficiently and reliably with a chlorinated solvent.

## Virtually emission free cleaning process

As a result, the company decided to retain a

well proven process in a safer environment. SAFRAN Nacelles invested into cleaning technology from the company HÖCKH Metall-Reinigungsanlagen GmbH, one of the leading closed cleaning equipment manufacturers. The new cleaning machine is one of the UK's largest, completely closed chamber systems for cleaning with trichloroethylene, perchloroethylene and modified alcohol solvents, operating under vacuum. Emissions stay below 1 ppm. The solvent is supplied and taken back for an environmentally responsible disposal in the SAFE-TAINER™ System, developed by SAFECEM. This system for transport, storage and handling, consists of two different, specially designed double-walled containers for fresh and used solvents. In combination with the new cleaning machine the SAFE-TAINER closed-loop transfer system represents the Best Available Technology (BAT) and enables a virtually emission-free cleaning process.

## Further improvements through COMPLEASE Chemical Leasing

DOWPER MC is a highly stabilised, virgin perchloroethylene grade which has a wide range of approvals in the aerospace industry. Integrated into COMPLEASE Chemical Leasing, the cleaning process can be improved even further due to a higher level of involvement from SAFECEM.

"The process lifecycle has become extremely reliable and efficient. We now have a clearly defined cycle of delivery,





testing, waste management, documentation, consultancy and HSE compliance all within a managed cost," states Stephen Ingham.

SAFECHM also coaches and consults on solvent maintenance in the CHEMAWARE™ Solvent Training every year. Involved staff not only get information on the safe handling of perchloroethylene but also on optimising the process by monitoring the quality and maintaining the solvent stability using MAXICHECK™ Test Kits and MAXISTAB™ Stabiliser. "Testing and analysis are critical to the safe and efficient functioning of the equipment, having staff trained and understanding the risks is essential," says Stephen Ingham.

Test results are recorded in a logbook provided by SAFECHM, allowing tracking of measurements and solvent quality over the entire lifespan. These services have resulted in a further decrease of solvent consumption up to 10 percent.

"Additionally, machine utilisation is running at 99 percent. Previous to the COMPLEASE™ Agreement, we have had occasions where the utilisation had been interrupted due to supply issues, testing problems and general health and safety issues," reports Stephen Ingham. In total, solvent consumption at the Burnley facility could be dropped by 92.9 percent annually compared to the previous cleaning technology.

SAFRAN Nacelles could also recognise a decrease of energy costs by 50 percent, mainly because the new system requires less energy for heating.

#### Another aspect: cost transparency

In addition to the technical aspects, COMPLEASE Chemical Leasing convinced with financial advantages. "Cleaning has also become more economical. This results on the one hand from reduced admin costs.



On the other hand, supply of solvent and stabiliser match exactly our need. Previously we held extra requirements to mitigate short falling," describes Stephen Ingham.

The annual cost for the solution package is negotiated on requirements and stays flexible to SAFRAN Nacelles' needs. The fixed monthly charge prevents from excessive cost peaks and enables the company to know its annual budget requirements. "Besides the process reliability and cost transparency, COMPLEASE offers high levels of safety for people and the environment," concludes Stephen Ingham.

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# A fertile environment for exhibitors to do business

MACH 2020 is being described as “the unmissable event for manufacturing technology suppliers”



Following on from the huge success of MACH 2018, which has already had upwards of £200 million worth of business attributed to it, the next edition of the show is looking to build on that success.

James Fudge, head of events at the Manufacturing Technologies Association (MTA), says: “MACH remains the market leader in the UK for manufacturing technologies exhibitions because we continue to refine our show and create a fertile environment for our exhibitors to do business.

“For the 2020 show, we have added new zones to the floor plans, so you will be able to continue to see a complete picture of the UK’s manufacturing sector. We have listened to our visitors and exhibitors to ensure we have the right balance of technologies. It is the unmissable event for manufacturing technology suppliers.”

Demand for space at MACH 2020 is in excess of what it was at the same point in advance of MACH 2018. The sales process for the show started during MACH 2018,

which saw a 50 percent increase in exhibitors rebooking on site to ensure they had space at 2020.

**New zones**  
For MACH 2020, new zones have also been added to the floor plans to give a fuller picture to the UK market. These include a new Automation Zone, as well as a branded new Training Zone. The Training Zone, alongside the already established Education & Development Zone, will enable visitors to get a flavour of what a career in advanced engineering is like.

The Training Zone will present a clear picture of how visitors can upskill their current work force. With this in mind, MACH 2020 is pleased to announce that the University of Wolverhampton’s School of Engineering, based at its £10 million Telford Innovation Campus, is the first institution signed up to attend.

The University has a growing reputation for excellence in aerospace engineering and motorsport and is the only University race team to compete in the national Formula 3 Championship. Facilities at Telford Campus include a high value manufacturing suite, composite materials lab, wind tunnel and additive manufacturing suite.

James Selka, CEO of the MTA, says: “We are delighted to confirm the University of Wolverhampton will be at MACH 2020. It is

our mission to keep pushing boundaries within the sector and the only way to do this is through high-quality education and application of those skills. Wolverhampton has a growing reputation as a top-class institution and shares our values for promoting, developing and harnessing the skills of UK engineers.”

Syed Hasan, head of the school of engineering at the University of Wolverhampton, says: “We are really pleased to be attending MACH 2020. It is the perfect platform for us to showcase the excellent facilities and the range of engineering and manufacturing courses we offer at our Telford Innovation Campus.

“Manufacturing Technology is something we’re very focused on and being at the UK’s market-leading exhibition will provide additional opportunities for us to engage with future talent in order to help address the skills gap in the manufacturing and engineering sectors.”

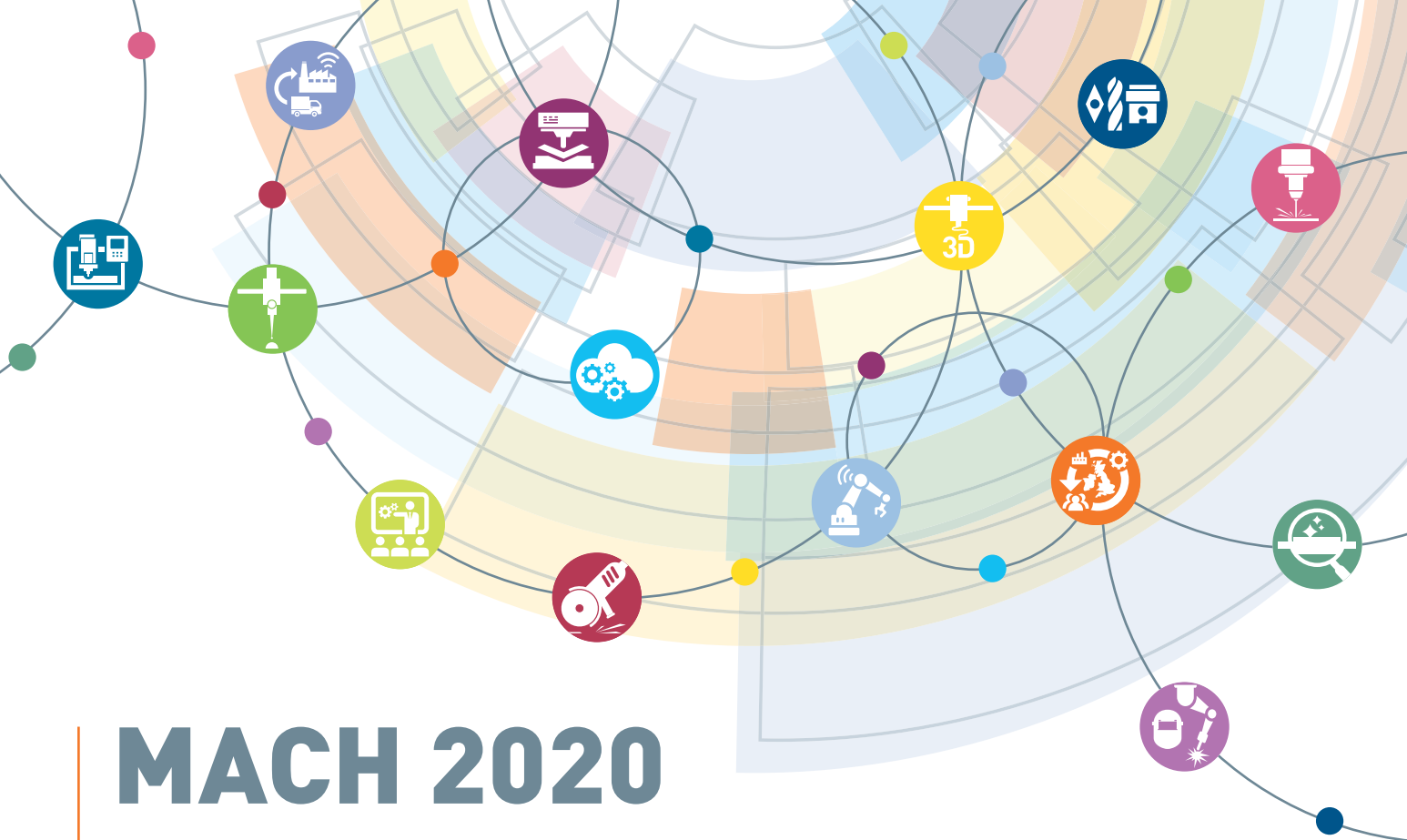
**One-stop shop**  
MACH remains a leading exhibition due to the amount of live working machinery running at the show and the fact it has the widest selection of equipment on display. MACH 2020 will take place between 20th-24th April at the NEC in Birmingham and it is now the right time for manufacturing technologies suppliers to start formulating their plans for how they’re planning to be there.

The MTA was pleased to see that the recent budget announcement included the expansion of the Annual Investment Allowance from £200,000 to £1,000,000. This was a specific request from the MTA and will make investing in new equipment at MACH 2020 more cost-effective for the vast majority of visitors.

The show provides exhibitors with a real return on their investment by delivering an engaged audience with real purchasing power.

Further information about the MTA and its members can be found at [www.mta.org.uk](http://www.mta.org.uk)





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# First showing in the UK at MACH

As the global leader in the manufacture and supply of Optical3D metrology products, the Bruker Alicona stand at MACH 2020 will be of interest to all visitors to the show.

The booth will feature a selection of the products from its range of optical metrology solutions that have become the de facto products for use in both tool measurement and the measurement of engineered surfaces.

The featured product, shown for the first time in the UK, will be the  $\mu$ CMM fitted with the pick and place automated loading system. The  $\mu$ CMM has changed the face of measurement technology in industry and, when combined with the 5-axis option and the automated loading system, provides a unique solution to engineers and toolmakers throughout the world. It enables the automatic critical inspection components with user influence.

The  $\mu$ CMM is a floor standing measurement system that can be used in both a production environment and also in a measurement room, for those companies who do not have room for, or need such a large system there are other products on display that can accommodate those requirements.

The first of these is the G5 system fitted with the Advanced Real3D rotation device providing five axis movement. This instrument allows the full geometrical measurement of components in a compact



bench mounted system that does not require any special environment. It can be used both in production and also in a research and development environment.

Completing the comprehensive line up at the show, the InfiniteFocus SL system will be on display. InfiniteFocusSL is a cost-efficient optical 3D measurement system for easy, fast and traceable measurement of form and finish on micro structured surfaces. Users measure both form and roughness of components with only one system. In addition, colour images with high contrast and depth of focus are achieved. The long working distance of up to 33 mm in combination with its measurement field of 50 mm x 50 mm allows a wide range of applications. Measurements are achieved in seconds and features, such as a coaxial laser for quick and easy focusing, further increase usability. With an automation interface, InfiniteFocusSL is also applied for fully automatic measurement in production.

All products work on the well-established FocusVariation principle providing dense point-based data in addition to full colour images. This data can be compared against CAD data to verify production methods and also used to effectively measure wear or variation from standard.

Bruker Alicona is a global provider of optical, industrial measurement technology for quality assurance of complex components of different shapes, sizes and materials. Its non-contact measuring systems are used in all areas of precision manufacturing. The company's core competence is in the measurement of dimension, position, shape and roughness in the fields of production measurement technology and automation, prototype development as well as traditional quality assurance. Based on the technology of Focus-Variation, these measuring systems close the gap between classical dimensional metrology and surface roughness measurement, since users can measure both GD&T features and roughness parameters robustly, accurately, traceably and in high



repeatability by using only one optical sensor.

The Bruker Alicona marque stands for agile development, high technological competence and the motivation to constantly drive innovation. Since its foundation as Alicona in 2001, it has been known for continuously improving both user-friendliness and production-suitability of optical measurement technology. This makes it one of the driving forces in the integration of measurement technology into production, thus constantly opening-up new opportunities for automation and increased productivity.

Alicona has been part of Bruker since 2019 and now operates globally under the Bruker Alicona brand. Headquartered in Graz, Austria, measuring systems are developed, produced and distributed worldwide. An international sales, service and support team as well as selected distributors ensure regional customer proximity.

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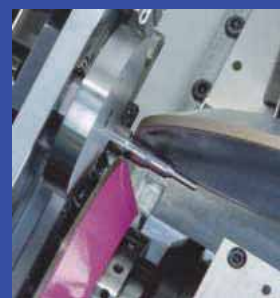
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# HP and Rösler sign cooperation agreement

## Automated industrial post processing for HP Multi Jet Fusion components

AM Solutions, Rösler group's brand name for all activities around additive manufacturing, and HP have announced a contractually fixed cooperation agreement covering the development of new equipment solutions in the field of automated post processing of 3D printed components. By jointly leveraging their technologies, this collaboration is aimed at bringing an industrial ready and scalable 3D printing post-processing workflow to their customers. Moreover, AM Solutions - 3D printing services expands its printing possibilities with the HP Jet Fusion 5200 Series 3D Printing Solution.

HP's industry-leading Multi Jet Fusion platform provides users with the ability to develop new designs, applications and production-ready final parts on the same platform and stay ahead with a future-ready technology. HP's Jet Fusion 3D printing portfolio includes the recently introduced Jet Fusion 5200 Series 3D Printing Solution, an industrial 3D printing system bringing new levels of manufacturing predictability, efficiency, repeatability, and quality to customers scaling to full production.

As specialist for the post processing of 3D printed products, AM Solutions – 3D post processing offers processes for unpacking, removal of support structures and residual powder, including sintered powder particles, surface cleaning and smoothing, radiusing of sharp edges, polishing and, even, dyeing of components with a specific colour. For the various post processing stages the company offers fully automatic systems, which not only guarantee significant increases in productivity and cost reductions but also ensure that the



Rösler's AM Solutions - 3D printing services is using HP's Jet Fusion 5200 Series 3D printing solution to meet the demands of its customers for production 3D printing capabilities

processes are absolutely repeatable and offer a high degree of sustainability. Stephan Rösler, CEO of Rösler Oberflächentechnik GmbH comments: "HP is an extremely valuable partner within our AM network. The cooperation allows us to further improve our automated post processing solutions and adapt them specifically to the Multi Jet Fusion technology from HP."

Ramon Pastor, interim head of HP 3D Printing & Digital Manufacturing, explains: "This partnership is an important example of HPs' commitment to collaborating with leaders in the industrial ecosystem to drive the digital transformation of manufacturing. The Rösler group offers comprehensive know-how in equipment building and surface finishing which is critical to production. We look forward to working together to broaden the opportunity for and accelerate mass production of applications across vertical industries."

### AM Solutions - 3D printing services expands its printing capacity

Parallel to the start of this milestone cooperation AM Solutions - 3D printing services, the Rösler division, specialised in printing activities, is expanding its digital manufacturing capabilities with the installation of its own HP Jet Fusion 5200 Series 3D Printing Solution. The service spectrum of this organisation is not just limited to 3D printing. It also includes the design/engineering of AM components. Highly experienced experts and state-of-the-art equipment ensure that the design possibilities of additive

manufacturing are fully exploited. This applies not only to the design of components from scratch and the redesign of existing components for additive manufacturing but also to the validation of a design or the optimisation of a component topology. AM Solutions - 3D printing services also offers post processing services, including machining, and quality control.



AM Solutions - 3D post processing offers equipment, process technologies and consumables for the automated post processing and surface finishing of 3D printed parts, be it for single piece manufacturing or volume production

Stephan Rösler comments: "HP is an extremely valuable partner within our AM network. The cooperation allows us to further improve our automated post processing solutions and adapt them specifically to the Multi Jet Fusion technology from HP."

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Rösler's AM Solutions – 3D printing services is using HP's Jet Fusion 5200 Series 3D printing solution to meet the demands of its customers for production 3D printing capabilities.

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Stephan Rösler and Ramon Pastor shake hands on the cooperation agreement

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# Surface treatment and aqueous cleaning equipment from a single source

Turbex, a leading provider of surface treatment lines, industrial washing machines and non-destructive FPI (fluorescent penetrant inspection) test equipment, will highlight its ability to supply problem solving solutions to meet customers' needs.

The Alton, Hampshire-based company's product portfolio includes the Galvatek range of plant for applications such as anodising, chemical cleaning or etching. The equipment is especially well known in the aerospace industry, as its lines are used in factories manufacturing aircraft parts and engine components as well as in the maintenance, repair and overhaul (MRO) sector. Supply of anodising plant forms a large part of the business. Such facilities comprise one or several lines and typically use TSA (tartaric sulphuric acid) or PSA (phosphoric sulphuric acid).

Turbex is also market leader in the UK for the supply of aqueous cleaning and drying systems for batch or in-line processing, which will also be promoted at the show. More than 100 standard models in the range include front- and top-loading spray washers, multi-stage automatic or manual ultrasonic systems, bench top and floor standing ultrasonic models, precision machines with basket rotation and flood options, plus tunnel cleaning lines.

One range of machines uses a world-patented system whereby rotation of the holding basket and spray jets is individually adjustable, allowing them to rotate in the same or opposite directions. Programs can be tailored, together with other movement options such as rocking of the basket, to wash even the most complex parts efficiently.

The equipment is aimed primarily at high-precision applications, with the possibility of simulated clean room conditions. Global and targeted cleaning is available in a single process and there will be an announcement at the show concerning a brand-new feature, vector kinematics.

Another focus will be modular and bespoke, high precision, ultrasonic cleaning machines with automation. A hallmark of their construction is multi-frequency ultrasonics, whereby a single transducer can generate two different ultrasonic



A Galvatek automated anodising line supplied by Turbex to BCW Treatments, Burnley



A Turbex Pro 550 six-stage, aqueous, ultrasonic cleaning line installed at Assembly Techniques, Dukinfield



A Turbex AC-1.7-2 aqueous cleaning machine for batch processing cast iron components supplied by Turbex to Selwood's pump production facility in Hampshire

frequencies. Consequently, dissimilar components and materials can be handled optimally in the same tank.

For processing larger parts, Turbex offers the ACV range of PLC-controlled front-loading, spray washing and rinsing models. They are particularly popular for degreasing, phosphating, paint removal, derusting and descaling.

Manufactured from stainless steel, the machine programme comprises single- and multi-stage units. Standard sizes range from one to three metres in diameter, although larger dimensions are available. The equipment provides a high level of cleaning performance due to ingenious design principles combined with elevated liquid flow rates and spray pressures generated by the powerful pump.

The FPI test equipment completes the Turbex offering. Through the company's long experience of component cleaning dating back to 1981, it has developed an extensive knowledge of the technology and the techniques required for testing and reporting. Its systems utilise expertise in automation and process control to provide consistency and traceability.

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# British Abrasive Federation – 2019 in Review



2019 has seen industries in which BAF membership and training providers operate challenged by uncertainty both economically and politically. Nonetheless, the need for representation of its abrasive producing members on the wider industry stage continues unabated, as does the need for the organisation to play a key part in workplace safety standards. Member representation and abrasive safety training continue to be the two key pillars of the work of the British Abrasives Federation and details of further work in these areas in 2019 is set out below.

The BAF Training initiative continued to provide a reliable, comprehensive and current package of training documents and resources to trainers of the users of abrasive wheels. The packages have had minor tweaks to ensure they stay current and in 2019 the Federation has undertaken no less than 10 re-accreditations, as is required every three years. The ever-growing network of accredited providers collectively train thousands of end users each year; reinforcing the safety principles the BAF has defined in line with legislation and the HSE. The BAF office has remained busy with incoming requests for popular workstation safety posters and questions and queries on abrasives safety and training.

Moving onto technical undertakings, in 2019 the BAF continued to play one of the

most present and active roles at FEPA (Federation of European Producers of Abrasives) of all national federations, leading the revision of ISO525 bonded abrasives standard and leading the revision of ISO 13942 standard – Limit deviations and run-out tolerances (bonded abrasives). It actively tracked progress in other commissions covering abrasive grain, coated abrasives, super abrasives, health safety and environment and played a major role in the revision of all of the EN safety standards and ISO 603 dimensional standards for abrasives. Standards that have been published after revision in 2019 include EN12413 for bonded, EN13743 for coated and ISO13942 for bonded abrasives.

As with 2019, in the work with FEPA in 2020 the BAF strives to reflect the current “state of the art” in terms of product safety requirements. It clarifies ambiguities in the standards so that members and anyone using the standards apply them correctly, ensure products comply with all aspects of design related to safety and marking requirements in respect to the selection and safe use of abrasive products. All this very technical work BAF undertakes translates into BAF members’ products offering the highest level of safety and compliance with regulations such as PUWER in the UK.

BAF council chairperson, John Willis would like to take the opportunity as he looks back on another successful year to thank the dedicated council members for their work in forwarding the two key pillars of activity summarised above. Sincere thanks also extend to the BAF membership and their continued support to whom he wishes prosperity for 2020.

The British Abrasives Federation is the

sole UK accrediting training body for the safe use of professional abrasives. It also represents a range of abrasives manufacturers and distributors present in the UK, giving them a voice on the European the global abrasives stage.

One of the main activities of the British Abrasives Federation is in the preparation and implementation of standards and codes of practice for abrasive wheels. The BAF is very concerned that many users of abrasive wheels and training organisations may be unaware of recent developments and has been seeking ways to promote these new initiatives. In particular, the BAF is conscious of the need for consistency and accuracy in the training being provided and has sought a means of ensuring that up to date information is made available.

This objective has been satisfied by two new initiatives. Firstly, the BAF have introduced a new range of Safety Posters. Secondly is the formation of a new training body, TASSIA - Training and Safety Specialists in Abrasives as the vehicle for the BAF in transmitting this information to abrasives distributors and end users and to fulfil the much-needed requirement of training the trainer.

The BAF is now giving accreditation to organisations providing operator training in abrasives safety whose courses meet the high standards demanded.

**The British Abrasives Federation**  
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# HB Bearings stays loyal with fourth Vista CNC grinder purchase

Adding further capacity coupled with the benefits of CNC precision and programming flexibility has resulted in Huddersfield-based HB Bearings Ltd acquiring a further Kellenberger VISTA universal grinding machine supplied by Jones & Shipman Hardinge.

One of the UK's foremost bearing designers and manufacturers, HB Bearings is a specialised manufacturer concentrating on very high precision, low volume production but in highly targeted end user industries. Established almost 50 years ago, the company has a global customer base and an archive of bearing design specifications, drawings and data probably unsurpassed in Europe.

"A highly skilled workforce and a commitment to quality are obviously vital, but we have always been prepared to invest in state of the art machine tools and this latest Kellenberger investment, our 4th CNC grinder, is testimony to that," explains HB managing director Graham Hirst, adding that there is more investment imminent: "HB has recently acquired Gamet Bearings who are renowned as manufacturers of super precision taper roller bearings," he explains. "We are relocating the Gamet operations from Colchester onto our Huddersfield site and further investment in high precision grinding capacity will be necessary. As we are working to 1.5 micron running accuracy tolerances on Gamet



HB Bearings Ltd now has four Kellenberger Vista CNC universal grinders in its manufacturing facility

products, we will be looking to invest in additional Vista CNC machines, such is our confidence in them."

In its Huddersfield production facility, HB has three Vista UR 75/1000 CNC machines now joined by the latest Vista SE, all of which have been supplied by Rugby-based Jones & Shipman Hardinge Ltd, the UK subsidiary of Hardinge Inc.

Built on the footprint of the UR/75 but with enhancements to guarding and the control package, the Vista SE machine features a UR wheelhead for external, internal and face grinding. The swivelling

wheelhead features pre-stressed, high precision spindle bearings to ensure the highest maintained surface finishes and long operational life. Suitable for grinding between dead centres and for chucked work, this is a further example of the machine's progressive design. HB has also specified a HF-dresser on the upper (X-axis) table.

Designed to be a cost-effective CNC alternative to hydraulically controlled cylindrical grinding machines, Vista machines have simplified the programming sequence thanks to the Kellenberger Kel-Easy and Kel-Iso menu-based system delivered via a FANUC 0i control system. Key features include the ability to micro-adjust the tailstock in the range of  $\pm 60 \mu\text{m}$ , linear guides on the X-axis, a classical slide arrangement in Z-axis and the ability to accommodate a workpiece up to 100 kg in weight. As the designation implies, the distance between centres on the machines supplied to H&B is 1,000 mm, as is the grinding length.

The compact design features a coolant tray which is separated from the machine base, an integrated transport system and swivelling upper table. The swivelling workhead, suitable for grinding between dead centres and for chucked work, is a further example of the machine's progressive design. Thermally optimised



The latest addition, a Kellenberger Vista SE machine

bearings guarantee the highest roundness and dimensional accuracy.

"We purchased the Vista SE to accommodate increased workload and given our previous positive operating experience with the Vista's, it made for an easy choice," explains Graham Hirst. "They are highly durable machines but importantly offer the sustained accuracy essential in our business. five microns is the norm we work to but we can meet demands down to two microns if needed and, as with all the Vista's, a capability of grinding highly complex, high precision profiles while maintaining tolerances and very high accuracy of concentricity is vital."



Programming using Kellenberger easy-to-use software on a FANUC control

Materials being machined are usually based on SAE 52100. However, certain motorsport applications may require more specialised bearing steel such as AMS6444 (52100 VIM-VAR) which is a super clean steel also used for special bearing manufacture. Occasionally material such as Cronidur is used which has a value which exceeds 52100 by a factor of between 8 and 10.

"The common denominator is that they are all difficult to machine and, with the micron tolerances we have to achieve with exact repeatability, the Kellenberger machines are more than up to the challenge," says Graham Hirst. "They have been an excellent investment," he concludes.

Hardinge, Inc. is the trusted global provider of high precision, computer-controlled machine tool solutions for critical, hard-to-machine metal parts and advanced workholding accessories. With over 125 years of experience, Hardinge offers the largest variety of metal-cutting turning machines, grinding machines, machining centres, collets, chucks, index fixtures, repair parts, standard and specialty workholding devices, and other machine



Grinding technician Kristian Folan (left) in discussion with HB Bearings technical director Darren Mawhinney

tool accessories. Hardinge's solutions can be found in a broad base of industries including aerospace, agricultural, automotive, construction, consumer products, defence, energy, medical, technology, and transportation.

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# Precision production for the perfect ride

## Grinding camshafts at Triumph with the Lean Selection cam from JUNKER

Triumph is a well-known name among motorcycle enthusiasts. The reliability and lasting value of the bikes is thanks to their high-quality production. Triumph uses the Lean Selection cam high-speed grinding machine from JUNKER to grind its camshafts.

"The models in the Modern Classics line are currently our most popular motorcycles, for example the Thruxton or Bonneville," says Jack Sellers, production engineer at Triumph Motorcycles Ltd in Hinckley, Leicestershire. The Modern Classics line is made up of new motorcycles with current technology in a timeless design. These classic bikes make for reliable companions, both on the roads where adventure lies around every corner and on leisurely rides where the rider can enjoy the synthesis between man and machine.

What's more, as of the 2019 season, Triumph Motorcycles are now the exclusive engine supplier to the FIM Moto2™ races, bringing their many years of experience in high-end engine building to the table.

### JUNKER meets the highest quality requirements

The high-quality finish of the camshafts for



the engine plays a key role. To achieve this, Triumph uses four Lean Selection cam machines from JUNKER across the Group. In addition to its headquarters in the UK, Triumph also has production sites in Chonburi, Thailand. The motorcycle manufacturer produces around 56,000 bikes

each year at both locations and has had a positive experience with the Lean Selection cam for high-speed grinding.

Jack Sellers says: "It is very important to us that the machines are reliable. The camshaft quality must always meet the high requirements that Triumph expects of its components. Thanks to the tried-and-tested Lean Selection cam we can maintain a high level of quality." This can also be achieved in three-shift operation, seven days a week. "It is very important to us that the machines are reliable," he adds.

The Lean Selection cam from JUNKER is the right choice for companies that require flexible production. The available grinding operations include cylindrical and non cylindrical grinding. Cylindrical, convex, concave, polygonal or elliptical workpiece geometries can be ground, with chamfers or radii if needed. It is particularly important for the motorcycle manufacturer that cams and bearings can be ground on the same machine in a single clamping setup.

### Quick changeover for new workpieces

Triumph has stringent requirements when it comes to flexible production. Technical improvements to components mean that the grinding process needs to be constantly readjusted. The Lean Selection cam makes it quick and easy to produce this wide range of



Jack Sellers (second from the left) and production engineer Supachai Leerungruang (third from the left) are pleased with the reliable Lean Selection cam in Thailand (Source: Triumph)

high-quality parts. Small series require rapid machine changeover, which is where the machine's easy operation proves itself. "Our setup engineers who work with the Lean Selection cam can change over the workpiece and associated program," explains Jack Sellers. He goes on to mention an example of rapid support for unusual requirements: "We grind very small concave radii on the camshafts. Due to a flange positioned in the centre of the workpiece, we had to come up with a solution to ensure that the spindle housing did not collide with the workpiece. JUNKER supplied an integrated turning station, a clever, custom-made solution."



Lufttechnik GmbH and ZEMA Zselics, Ltd. also belong to the JUNKER Group. LTA Lufttechnik GmbH manufactures air filtration and fire protection systems for trade and industry. ZEMA completes the group as a specialist for corundum grinding.

**Erwin Junker Maschinenfabrik GmbH**

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The Lean Selection cam is an economical and flexible machine concept for machining camshafts in all batch sizes (Source: JUNKER)

## Extremely pleased with the service


JUNKER assists with the integration of new machines. Triumph employees completed training for programmers so that the new machines would be up and running right away. Jack Sellers says: "The trainers from JUNKER were highly motivated, capable and explained everything. This meant that we had a good understanding of the machines right away." He is also highly satisfied with the service in the UK and Thailand: "If we have any queries, JUNKER is quick to respond and suggest solutions. As a whole, we have had a very positive experience with JUNKER Service."

The JUNKER Group, headquartered in Nordrach, Germany, is a world leader in the production of CBN high-speed grinding machines. Close to 1,500 employees worldwide maintain the company's technological edge. Renowned automotive companies and their suppliers, as well as tool manufacturers and other industries, trust JUNKER's innovative grinding concepts. Whether for mass or small series production, JUNKER grinding machines operate precisely, economically and reliably.

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# Where craftsmanship and high-tech go hand in hand

For over a century, Okuma, represented in the United Kingdom by NCMT, has been developing grinding machines for the highest quality demands. Though a lot has changed since the beginning, some aspects remain the same. Okuma CNC grinders still achieve their high precision, productivity and longevity due to a symbiosis of craftsmanship and state-of-the-art technologies.

Okuma is the only single-source CNC provider in the industry to develop and produce all hardware components, the controls and the software for the machine tools in-house. The development and production from one single source leads to a perfect combination of hardware, software and electronics. Due to their outstanding precision and high productivity, the grinding machines can be found in several industries. They are used for a wide range of materials including soft, high-strength and temperature-resistant materials as well as sintered alloys, Inconel or chrome-plated workpieces.

### Craftsmanship for highest quality

In addition to the modern technologies that Okuma is constantly developing and



Okuma grinders like the GA26W combine highest productivity with outstanding precision and offer extreme longevity

optimising, the machine tool manufacturer also relies on skilled craftsmanship that has become rare. In the CNC grinders, for example, hand-scraped sliding surfaces are used on the guideways and mounted components. The manufacturing process of hand scraping is very time-consuming and requires a high degree of skill and experience. Nevertheless, it is worth not neglecting this demanding manufacturing

method, as the resulting sliding surfaces have a degree of durability, precision and quality that could not be achieved with other methods. With the exceptionally long service life and availability of the machines, Okuma ensures that the total cost of ownership (TCO) remains as low as possible.

### In-house developed control facilitates operations

All Okuma CNC grinders are equipped with the in-house control OSP-P300GA, which was developed specifically for grinding applications. The control has an intuitive user interface, and very little user input is required. In addition, the control is easy to customise and can be modified and individualised with apps allowing for ergonomic and productive workflows. An example for this is an app for determining the optimal dressing parameters, which can be used to perform dressing simply, quickly and with highest precision.

### All-in-one processing from a single source

In addition to stand-alone standard machines, Okuma offers complex production cells. This not only means an automation of the grinding processes. Rather, it covers the entire machining of a workpiece including turning and milling operations on Okuma machines. Users benefit from the consistently high



Hand scraping, as it is used by Okuma, is extremely time-consuming and requires a lot of experience and skill



manufacturing quality of Okuma solutions and only need to be familiar with one type of control. As a result, the Okuma solutions can be used for a wide range of applications, and only one operator is needed to control and monitor the entire manufacturing cell. Especially in times of a shortage of skilled workers, this proves to be a considerable advantage.

Okuma Europe GmbH is the Germany-based sales and service affiliate of Okuma Corporation, a world leader in CNC machine



Okuma grinders possess hand-scraped sliding surfaces that help to achieve extreme precision and longevity

tools, founded in 1898 in Nagoya, Japan. The company is the industry's only single-source provider, with the CNC machine, drive, motors, encoders, spindle and CNC control all manufactured by Okuma. Okuma's innovative and reliable technology, paired with comprehensive, localised service protection, allows users to run continuously with confidence, maximising profitability. Along with its industry-leading distribution network, Okuma facilitates quality, productivity and efficiency, empowering the customer and enabling competitive advantage in today's demanding manufacturing environment. For more information, contact:



The Okuma OSP-P300GA control was specifically developed for CNC grinders and allows for ergonomic as well as efficient operations

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# Chicago Pneumatic CP3550 series expands to meet all your industrial grinding and sanding needs

With the addition of nine new products, Chicago Pneumatic has created a comprehensive range of grinders and sanders to meet the need to increase productivity while offering operators comfort. The expanded CP3550 series promises high-quality finishes with minimal effort, thanks to powerful and easy-to-handle metalworking tools offering intensive industrial durability at an accessible price.

"The expansion to a 17-model range allows perfect matching of applications and tools," says Harald Odenman, Chicago Pneumatic's product marketing manager, Material Removal. "These innovative products score highly over competitors in terms of performance and ergonomics. Their superior power creates greater torque for faster material removal rates, making users more productive. Efficiency is further boosted by easier tool handling and control, with better comfort. This allows fast, precise work and reduces operator fatigue."

### The new additions

A 6" angle grinder has been added to the existing five models with 4 to 5" wheels. Four new die grinders, two standard and two extended, join the previous angle die grinder. These come complete with an Erickson 200 collet for attachment of 1/4" and 6 mm mounted points and carbide burrs. The two current 5" angle sanders are now complemented by two new tools for use with 7" abrasive pads. The other two additions are low-speed sanders, whose gearboxes generate high torque with reduced speed (3,000 rpm) for polishing or delicate applications. They operate with 7" or 9" sanding wheels or flapwheels and, like the angle sanders, give a choice of models with 5/8" or M14 shaft threads.

Designed primarily for high-output work



environments like foundries, casting plants, fabrication shops and shipyards, CP3550 series tools are also ideal for production and maintenance operations involving cast iron, steel, stainless steel, aluminum, alloys and composites. Typical tasks include deburring, contouring, chamfering, fettling, weld seam removal, surface preparation, cleaning, polishing and finishing.

### Best in class

Compared to direct competitors in its category, the CP3550 series with its 1.5 hp, 1100 W governed motor delivers the highest power. In tests against those products, material removal rates using CP3550 tools were over 50 percent higher and in one case over 80 percent.

Advanced features on all models include a rotating inlet swivel, found on no other comparable tool at this power level, which enables free manoeuvring and avoids hose knots. The streamlined safety lever found on each tool can be operated comfortably, even in thick gloves, and is easily directed downwards. Small-diameter handles give a comfortable grip, while a thermally insulated composite over-sleeve avoids the discomfort of handling cold tools over long periods. Meanwhile, unique silencer foam technology reduces noise emissions.

Downtime for accessory changes on CP3550 angle grinders and angle sanders is reduced by a fast and simple spindle lock

feature requiring just one wrench. Keyless angle grinder guard adjustment, unique against direct competitors, enables quick changes, even when wearing gloves, to suit different work positions and to deflect sparks safely.

### A complete range for high-quality finishes with minimal effort

"With CP3550 series tools you get a lot of power, performance and ergonomic features at an affordable price," concludes Harald Odenman. "They also save on operating costs, thanks to a 1,000-hour maintenance interval and a tough construction designed for long life and reliability in demanding industrial applications. Best of all, you can now meet all your grinding and sanding needs through one complete range of compatible pneumatic tools which give you a great finish quality with great ease."

For further information, and to learn about Chicago Pneumatic's innovative solutions for the industrial market, visit [www.cp.com](http://www.cp.com) or follow it on Twitter and LinkedIn. You can also share experiences with the CP community on Instagram.

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## Precision and pace secures order from Jaguar Compressors

The TG350E rotor grinding machine from UK-based Holroyd Precision is rapidly making a name for itself as the preferred choice among industrial refrigeration specialists globally.

There are currently in the region of 70 TG Series machines in use around the world and, each year, Holroyd typically receives orders to build several new TG models. The most recent order for a Holroyd TG350E has been placed by Jaguar Compressors, a division of the Xiamen East Asia Machinery Industry Company. Currently in build, and costing some £1.3 million, the machine will be shipped to Jaguar's Xiamen-based manufacturing facility in mid-2020.

"Renowned for uncompromising quality, Jaguar Compressors continually strives to enhance the performance and energy efficiency of its screw air compressor products," comments Holroyd regional sales director, Steven Benn. "With the ability to precision grind medium to large capacity rotors of up to 350 mm in diameter and 1,795 mm in length, the TG350E model offered a versatile, high quality solution to

Jaguar's varied production requirements in producing screw compressors for a variety of applications, including precision filters, gas storage tanks and refrigerated dryers."

Holroyd TG Series machines are widely recognised as providing the industry benchmark for high-speed, high-accuracy efficient stock removal. Considerable levels of automation mean reduced setup time. As an additional advantage for users of Holroyd TG Series models, a significant amount of production time can be saved as each machine's diamond dressing discs are able to continuously dress during the semi-finish grinding cycles. By contrast, cutting tools typically require periodic regrinding, the frequency of which is determined by the materials and volumes being cut.

Designed primarily for the finish grinding of helical screw components after they have been milled to a rough or semi-finished state, Holroyd TG Series machines are equally suited to prototyping and batch manufacture as they are to volume production. 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 disc and does not require a high level of operator skill.

Incorporating the brands of Holroyd and Holroyd Precision Rotors, PTG has established itself at the forefront of high-precision machine tool design, build and supply for specialised applications.

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## It's all in the Balance

### In-process measuring systems

Balance Systems' in-process measuring systems include: absolute measure of diameters comparative measure with master reference features to measure both continuous and interrupted surfaces (regular and irregular), roundness and shape analysis; measure of external and internal diameters, thickness, overstock division, taper, flagging and more wide range of tools: slides, supports, arm, tracers and anti-crash systems; part programs defined for each type of workpiece to be produced; automatic compensation for process correction; special customised applications

### Control grinding wheels contact

The control of the grinding wheel balancing and its dresser allow to obtain a perfect profile while optimising removal of the grinding wheel surface, which is evident by the increase in the tool life and reducing environmental impact.

The exact identification of the instant when the tool touches the workpiece is an essential information to minimise the cycle

time. The use of such information allows to reduce the "air grinding" time, optimising the axis infeed.

Balance Systems offers a complete range of power sensors and acoustic emission (AE), that are able to: detect sub-micrometric contacts ("gap" function); monitor constantly the work in progress preventing collision situations ("anti-crash" function); provide feedback signals for adaptive control.

Furthermore, these power sensors and AE sensors, that are stand-alone or built into the balancing head dedicated to the spindle-grinding-wheel, can be combined to a refined control unit that exploits advanced techniques of digital filtering.

### Balancing of the spindle and grinding wheel

The balancing of the spindle and grinding wheel is an essential operation to achieve the machining's surface quality and to ensure a long life of a rotary components.



Balance Systems offers a wide range of balancing systems based on balancing heads which can be installed externally or built-in the spindle. Control units are equipped with cable and contact less (no-link) solutions and provide constant vibration monitoring. The newly designed "Absolute Balancer®" state-of-the-art technology is characterised by unprecedented performance levels in terms of execution speed and balancing precision on one and two planes.

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# Setup time optimised grinding wheel measurement

Common methods for measuring and setting grinding wheels and grinding wheel packages are tactile or laser measurement in the grinding machine. In addition to measurement inaccuracies, it is above all the long machine downtimes that make these methods uneconomical. No tools can be produced during the setting and measuring process. In addition, several measuring cycles are often necessary until the correct setting is found.

The setting and measuring device manufacturer ZOLLER offers device programs especially for grinding wheels and grinding wheel packages. This makes measuring not only simple and operator-independent, but also parallel to production time. The machine can continue production and the measured data can then be transferred directly to the grinding machine.

The assembly of a grinding wheel package begins when the CAD/CAM data is retrieved from the system. In the 3D view, not only can the entire grinding wheel package be displayed from any perspective, but each component is displayed separately and listed in a setup sheet - from the grinding mandrel to the spacer and grinding wheels to the clamping nut. With its storage systems and the tool management software TMS Tool Management Solutions, ZOLLER already offers solutions for effective and transparent tool handling for the inventory and storage of these individual components. Each component is sorted into a fixed compartment of the »toolOrganizer« tool cabinet and can therefore be found quickly and easily. This means that not only the component itself is stored in the setup sheet, but also its storage location. Graphical representations in the software module Storage location management and

optical aids such as LEDs also facilitate and accelerate the location of the individual components.

Once all the individual components have been removed, the operator can assemble the grinding wheel packages with graphic support in the form of assembly drawings and photoreal 3D representations and make them available for measurement.

Often the same grinding wheel packages are used again and again and are not even dismantled, but only freshly dressed and then stored as a complete package. ZOLLER also offers a solution for this case: with the »keeper« tool cabinet. Complete grinding



The ZOLLER tool cabinet keeper is suitable for storing the grinding wheel packages

wheel packages up to a diameter of 300 mm can be stored here. The structure and storage location of the grinding wheel package is stored in the system and can be easily found with graphic support, as can the individual parts. Measuring these grinding wheels in the ZOLLER presetting and measuring machine is correspondingly simple, as the measuring sequences for already measured grinding wheel packages are stored and only need to be called up.

Since the measuring sequences of complete grinding wheel packages are stored in the 'pilot' measuring machine software, measuring is also correspondingly simple. The grinding wheel package is inserted into the spindle and the corresponding measuring program is started if measurement sequences have already been stored. The measured values are immediately available and can be transferred to the grinding machine.

Each type of grinding wheel according to the FEPA standard is stored in a database as a photo-realistic representation. The operator can select the grinding wheels



Non-contact measurement of grinding wheels in transmitted light on ZOLLER presetting and measuring machine

using images at the touch of a button. The measurement sequence based on this can be started directly.

### Data transfer to the grinding machine

The exact measurement data of the grinding wheel packages are converted directly at the ZOLLER presetting and measuring machine into a machine-specific data format suitable for control and sent to the machine control system. The electronic data transfer is not only particularly fast, but also particularly secure.

The first tool can now be produced or reground on the basis of this measurement data from the grinding wheel packages. In addition to measuring the grinding wheels, the ZOLLER presetting and measuring machine can also be used to analyse the grinding result and check it for correctness.

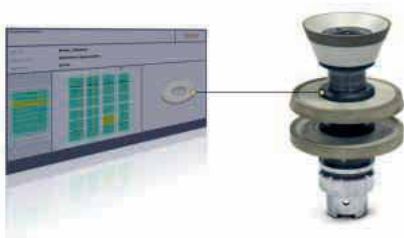
ZOLLER uses the available grinding data from the CAD/CAM system directly in order to measure the manufactured tools holistically and comprehensively. This data is read in by the control of the ZOLLER presetting and measuring machine and used to generate a fully automatic measuring sequence, either for complete measurement or according to the operator's input. By comparing the actual contour with its target data, the system directly outputs the deviations between the two contours using the 'lasso' program.

### ZOLLER UK

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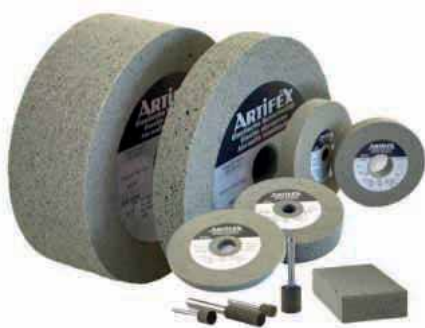


Each component of the grinding wheel package can be found easily and quickly via the TMS Tool Management Solutions software

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# Digital factories: a fourth Industrial Revolution

There is little doubt that digitalisation has already arrived, but the information we glean from the data collection, its analysis and ultimately the decisions we make as a result will define how much of a success this so called fourth industrial revolution will be.

How can this technological revolution help us to solve the everyday manufacturing problems of machine utilisation, cycle time improvements and cost reduction?

In the field of grinding, TYROLIT has long since been an innovator and, with more than 120 people in research and development, the goal has long been to provide added value through product development and application engineering. TYROLIT'S move into the world of in process data analysis comes through its collaboration with Komet Brinkhaus to adapt an already proven system for hard point tooling for use in grinding processes.

The result of years of development is TOOLSCOPE, a system that can be connected to virtually any grinding machine and enables the user to evaluate and optimise any grinding process. The system has been created with easy-to-use Apps that not only help monitor and evaluate the grinding process itself but are also able to measure machine condition, create a tool change log and maintain and hold quality documentation for each and every individual part produced, hugely valuable in industries such as aerospace and medical.



The system is available with more than 10 defined Apps, including collision detection which can significantly reduce costs and time spent in the event of a collision and minimise downtime and repairs to machine and fixtures. Machine condition monitoring can search for machine tool problems and offers predictability, allowing preventative maintenance measures that reduce downtime and increase machine utilisation.

In terms of process assistance, not only can the system evaluate your process, both

on and offline, it is able to maintain the process within mapped limits and can even adapt the feed and dressing processes in case of material variation such as excess stock or material hardness. The unit can take both internal machine signals directly from the control system and record external information from inputs such as acoustic sensors. Early warning can reduce scrap and improve the process and gives greater overall control of a process.

A simple example of this would be the continuous measurement of coolant pressure, critical in processes such as Viper grinding, where a drop in coolant pressure can result in a gradual deterioration in the ability of the grinding wheel to remove stock and increasing the potential risk of burning and cracking of the part.

In addition to these features TOOLSCOPE can provide transparency in terms of forces and spindle power to enable application engineers to choose parameters that are optimal for both grinding wheel and part and continuously maintain the grinding process in a safe and cost-efficient zone.

The above are just some of the features and benefits of the TOOLSCOPE system, providing a major advance in the ability to develop, monitor and maintain virtually any grinding process and brings the reality of an industry revolution one step closer.

A demonstration of the TOOLSCOPE system will be available at the MACH 2020





exhibition. For further information please contact us.

## Knee prosthesis - TYROLIT helps patients get going again

The field of medical technology is booming with continuous growth rates. An aging population engaged in higher levels of activity means a greater need for implants, medical screws and prosthetic joints. At the same time, the technical requirements placed on artificial body parts, such as material properties, cleanliness, geometric accuracy and surface finish, have also become more stringent. However, this also means increasing requirements being placed on the production of such components.

In addition, manufacturers are also under rising price pressure from international competitors. Above all, there is a desire for the shortest possible production times. At the same time, better surfaces are increasingly being sought for materials that are often difficult to handle. Working together, leading grinding wheel manufacturer TYROLIT and grinding machine manufacturer Schütte have now

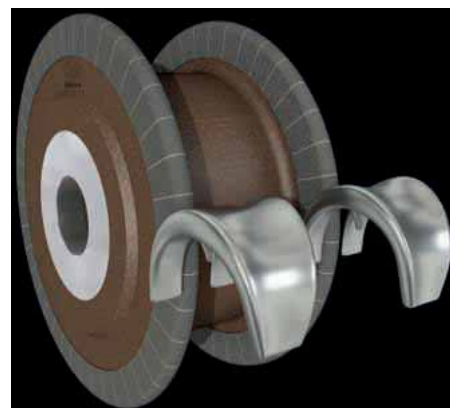
succeeded in breaking up this vicious circle and dramatically improved grinding times for artificial knee joints from 12 minutes right down to just four and a half minutes.

In the case in question, a core from a high strength but lightweight aluminium base alloy was selected. It offers better damping performance than those made of steel and is 65 percent lighter than a steel core.

The grinding layer of GENIS 2, made out of vitrified bonded CBN, stands out primarily due to its high rate of stock removal at very cool temperatures. Both characteristics are highly valued in the grinding of prosthetic knees from chrome/cobalt compounds. The 1FF1 form offers the advantage that the grinding layer can be used in full over the entire 20 mm height, which also leads to an increase in productivity for the customer.

With the new product line, GENIS 2 N-LW (Natural Lightweight) TYROLIT sets further new standards in knee joint grinding. Due to the extremely low density of the patented core material N-LW, significant weight savings can be achieved.

GENIS 2 N-LW tools are lighter and above all more cost-effective than comparable



tools with CRP cores. At a customer in Germany, outstanding grinding results were achieved with this disc at low cost per component.

These examples show that with TYROLIT, the medical technology customer, in particular, keeps its finger on the pulse of the times.

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## Modular Assistance System ToolScope

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**TYROLIT**

# Latest bore finishing machine installed at Engis

Based in Henley on Thames, superabrasives specialist Engis UK is the European headquarters of Engis Corporation and supplies customers with solutions ranging from one-off electroplated grinding and honing tools, to complete bore finishing machines.

One of the benefits Engis UK offers customers is its well-equipped bore finishing laboratory which provides technical support and expertise in developing bore geometries for applications in sectors including automotive, hydraulics and aerospace, using materials including ceramics, steels, iron and aluminium.

Expanding these facilities, the Henley laboratory has recently seen the installation of one of Engis latest SPM 6000 bore finishing machines, with which it will conduct process and tooling trials for customers and prospects across Europe. The new machine is supported by leading-edge metrology equipment, with the ability to measure the cylindricity, roundness and straightness of bores to an accuracy of 0.1 microns.

Investment in the laboratory demonstrates Engis UK's belief in working closely with customers to develop optimum solutions to their manufacturing requirements. Each process, including stock removal rates, bore geometry requirements and surface finish, is studied step-by-step to ensure customers achieve all their engineering objectives.

One of the most critical features in any bore finishing system is the workholding fixture design. Using the new machine, Engis technical staff will be able to review each application and determine and test the best approach to fixture the part, so that the bore geometry objectives can be achieved. In addition, other key factors such as simplicity, versatility and quick change-over



can also be taken into consideration, so that the entire process can be trialed.

### Benefits of single pass bore finishing

Conventional bore finishing uses a tool with cutting surfaces that expand and contract as the tool reciprocates in the bore through the cycle. Unfortunately, simultaneous radial and axial movement makes controlling bore size and cylindricity difficult. Engis single-pass bore finishing process, which uses fixed-size bore finishing tools electroplated with diamond abrasive particles, overcomes these issues, as the tools pass through the bore only once, removing a specific amount of material. Using a series of progressively larger bore finishing tools Engis single-pass system enables precise and repeatable control.

### Engis SPM 6000

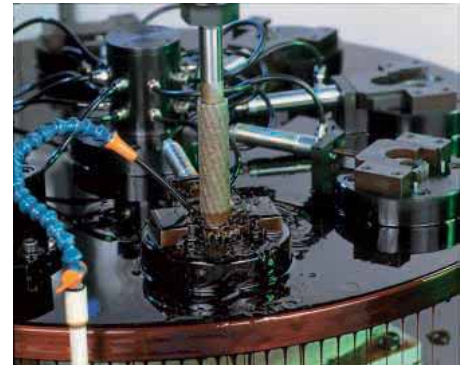
The SPM 6000 which has been installed in Henley is one of Engis range of small production machines and is designed to meet the needs of manufacturers of small to medium sized components with bores up to 50 mm diameter. The machine can be configured in four, six, eight and 10 spindle models, although the example installed at Engis UK is a six spindle, eight station version.

Standard features of the machine include a servo-fed column, life-time pre-lubrication of linear slides and ball screw, pneumatic counterbalance on the head and an electro-mechanical, cam-style precision indexer, together with full Mitsubishi CNC controls capable of supporting additional optional advanced features.

Possible additional enhancements include: extended stroke length (standard 457 mm); spring-loaded "crash sensors" interlocked with machine controls to protect

the machine and tooling from potential accidents; shadow gauges (interlocked with the machine controller) to detect mis-loaded components, full-perimeter guarding with light curtain for added operator safety; a "walk away" switch that enables increased production potential; a wide variety of automation and gauging packages; torque-based feed compensation, and electric controls packages.

Engis is a world recognised authority in both the manufacture and application of precision bore finishing tools including through-bore, blind-bore, dual diameter finishing, seat finishing and internal float design tools. As Engis bore finishing tools are electroplated, not bonded with a metal or vitrified matrix, the superior diamond particle exposure provides for cooler cutting action, extended tool life and better size control when compared with conventional honing tools.



In standard blind and semi-blind bores Engis diamond-plated and super-abrasive finishing tools can achieve bore geometries to within 0.5 microns.

Engis solutions can be configured to satisfy bore finishing challenges from the simplest to the most complex. For high-volume applications, Engis Single-Pass bore finishing systems provide the ideal solution, offering improved roundness, concentricity and finish, while achieving extremely tight tolerances, reliably and consistently, at a lower cost-per-part, with the ability to add robotics and other automated systems for high volume requirements.

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**Skiving and Roller Burnishing.** For cost effective bore sizing on hydraulic cylinders and other high-production applications, Sunnen's new SHDS-series machines are 60% to 70% faster than traditional honing, yet deliver precise tolerances and quality surface finishes.



**Lapping.** When bore specifications call for extremely tight tolerances, Sunnen's SVL-2115 automated bore lapping machine brings increased productivity and consistency to what has traditionally been a manual process.

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# New automated lapping machine "takes flight"

Sunnen's latest bore finishing machine "laps" the field on productivity for aerospace OEMs and suppliers



The new SVL-2115 is a multi-stage automated lapping machine that laps and air gages bores in one setup, freeing operator time and increasing part consistency. Aerospace part manufacturers have found a cost-saving solution for bores with large length-to-diameter ratios and very tight tolerance requirements.

Sunnen's SVL-2115 automated lapping machine brings increased productivity and part consistency to what is traditionally a manual process. Based on the same proven SV-2115 honing system, the SVL-2115 provides single setup processing of hydraulic valves, sleeves, fuel system components and other parts that are prone to distortion when honed. The patented system control is designed for unattended operation and automatically laps and air gage bores throughout the cycle. Gauge readings are fed back to the control and the cycle is repeated until the parts are within specifications.

"Automated lapping is more consistent than manual and there are fewer workers today with the skills necessary for precision manual lapping," says Phil Hanna, Sunnen product manager. "For very expensive parts, an automatic lapping process reduces the possibility of ruined parts due to human error. Since lapping is usually the last process during the machining of a workpiece, if the lapping is not correct all the work to get the part produced up to that point is wasted."

The patented Sunnen lapping tools are available for workpiece diameters from 6.3 to 45 mm (0.25 to 1.77 ") and lengths up to 12 times the bore diameter, not to exceed 200 mm (7.87 "). Additional diameter ranges are in development. Spindle speed range is 100-2,000 rpm during lapping, but it is capable of slow speeds for non-powered steps, such as lapping paste application or slow rotation bore entry. Stroking speed is 0-350 SPM, with stroke length optimised to achieve a high degree of cylindricity.

"This system is a time-saver and it frees operators to run another machine, or handle other job floor duties," adds Phil Hanna.



"Operators load the workpiece into the fixture and start the lapping cycle, which ends when the part is in tolerance. With automated lapping, less-skilled operators can achieve consistent, close-tolerance results. The precision control valve market is growing, not only in aerospace but other industries as well. We have numerous SVL-2115 machines now in operation around the US, proving the need for automated lapping."

Due to the outstanding ergonomics of the machine, repetitive motion injuries often encountered with manual lapping have been virtually eliminated. There is no need to touch a moving part during the lapping process, and a light curtain is standard, so safety is greatly improved. Easy tooling and probe changeovers accommodate multiple different parts runs during the course of a shift. A stack light allows operators to monitor cycle completions or faults from a distance.

The complete automated lapping solution, including machines, tools, fixtures, lapping paste, gauge probes, coolant systems and coolants is also available.

Sunnen Products Company is the leader in

precision honing equipment for both the industrial and engine building market. Sunnen has a system for virtually any bore sizing application that demands the highest standards and stringent tolerances, even submicron tolerances.

Sunnen offers the industry's most comprehensive line of precision honing systems, including horizontal and vertical, single and multi-spindle, standard and integrated precision honing systems, as well as systems with automated parts loading and in-process or post-process gauging and lapping systems, plus skiving/roller burnishing systems.

The system is just the beginning, however. As the world's foremost authority on honing, Sunnen has incorporated its experience into a complete line of abrasives, tooling and gauges.

Additional information on the SVL-2115 is available at [www.sunnen.com](http://www.sunnen.com) or contact:

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# Gehring presents technologies for modern manufacturing

## Stator production – the core process in electric powertrain production

The electrification of the powertrain plays an important role in CO<sub>2</sub> reduction. The automotive industry requires production technology for the introduction of their hybrid and electric vehicles which is very flexible in terms of quantities and types and at the same time guarantees short cycle times and high quality.

The stator is the part of the electric motor with the largest production effort and thus the greatest potential for optimisation. Hairpin stators offer the best performance characteristics and the highest automation potential for mass production of stators. Here, deviating from the known winding or pull-in technique, individual hairpin slip-in coils are formed of flat copper wire and inserted into the stator housing. Core processes include pin production, setting and inserting the pins into the stator, twisting the pin ends, laser welding and impregnating the stator.

Gehring has developed integrated production solutions for stators for electric motor production together with the specialised subsidiary copperING. Automobile manufacturers and suppliers receive all the relevant technologies as well as the process and system design from one provider. The Gehring Group supplies fully automated, flexible stator production lines that fulfil the quality requirements as well as the cycle times and flexibility requirements of the automotive industry. Gehring relies on a combination of in-depth understanding of technology from its own e-mobility experts and extensive experience in process and system design.

At EMO 2019, Gehring presented two new machines from this process chain: a robot-based station for setting the pins in the stator slots and a laser machine for welding the wire ends.

### CO<sub>2</sub> reduction in combustion engines to comply with emission standards

In parallel with technological developments in e-mobility, it is important to further develop existing vehicle models with internal combustion engines in such a way



Nanohoning is used to produce engines with coated cylinder liners, which makes them more compact and efficient. Gehring supplies corresponding equipment to car manufacturers worldwide

that they comply with ever stricter emissions legislation.

Two efficient methods come with the so-called "Nanohoning" and "Formhoning" from Gehring. These are process sequences to produce motors with coated cylinder liners (Nanohoning) and a technology for the compensation of distortions in the engine (Formhoning). Both methods are now used in the mass production of internal combustion engines and achieve significant savings.

### Complete package honing technology - production-ready innovations with effect

The Nanohoning technology chain is used to produce motors with coated cylinder liners and includes the process chain roughening – thermal coating – honing. Thermal spray coatings in cylinder liners of internal combustion engines increase the energy efficiency of the aggregates through lower friction. Wear and size of the motors are reduced. In addition to honing processes, Gehring also supplies laser roughening in this process chain. The laser roughening enables high adhesive pull strengths with

low roughness. Thus, less coating material is needed. It also reduces operating costs by eliminating tooling costs compared to other processes.

To further improve fuel economy in conventional aluminum or cast-iron engines, Gehring has introduced the technology of form honing. Form honing simulates the deformation of cylindrical shapes of combustion engines under operating conditions during honing, which results in a nearly cylindrical shape. This has a positive effect on CO<sub>2</sub> emissions, oil and fuel consumption, performance and wear. The technology has been industrialised in cooperation with leading global automobile manufacturers and now provides cost benefits for plants in the USA, Europe and China. Thus, in serial production, a more than ten percent reduction in friction in the cylinder bore could be achieved, or an emission reduction of about 1.5 grams of CO<sub>2</sub> per kilometre. The cost of implementing the process is only a fraction of other measures with a comparable effect.

Based on the newly developed PT 600 two-spindle honing centre, Gehring



presented the complete range of honing technology for machines, automation, tools, abrasives and contract machining at EMO. Both series and V engines can be machined on the PT 600. With its tool changer, comprehensive process capability, ergonomic loading concept and optimized installation surface, it is suitable for the flexible production of a wide range of engines at tier suppliers and contract manufacturers.

## Laser structuring of functional surfaces

As an expert in functional surfaces, Gehring not only offers honing, laser honing and



Laser roughening of cylinder liners is a Gehring development that makes the process of producing coated engines safer and more efficient

laser roughening products but also laser structuring machines to increase static friction. Due to the functional design of the surfaces, sometimes complex and expensive processes and components can be replaced. At EMO, Gehring presented the new GLS 1000 live. It can be used as a standalone solution or integrated into a production line. Gehring regards itself as a technology partner, developing applications together with the customer.

## Gehring CORE

Another premiere of Gehring was the new IoT customer premiere platform Gehring CORE, with which the users receive individually prepared data of their machines. This allows them to take advantage of predictive maintenance and transparent manufacturing. Also, very specific production analysis and optimisation measures become possible. The user platform can be operated in the network at the customer, as well as a Cloud service.

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The Gehring subsidiary copperING has been developing and building production machines for electric motors for more than 15 years

With the Gehring and copperING brands, the Gehring Group offers innovative production solutions for highly efficient conventional and electrified power trains. In the field of fine machining, the company has been shaping the development of honing technology for more than 90 years and provides the automotive industry with the processes of laser roughening, coating and honing answers to the current challenges around the combustion engine. The production technology for e-mobility expands the Group's portfolio and sets new standards in the flexible series production of electric motors



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# Ultra-fine filtration technology as a value-adding factor

### Optimally filtered grinding oil increase quality and reduce costs

Finely filtered grinding oils in tool manufacturing are an important key to more quality and efficiency in production. Tool manufacturers that rely on the right technology and competence of their fine filtration equipment manufacturer make optimal use of the many advantages offered by efficient grinding oil filtration.

Metal abrasion, dirt, and decomposing materials due to thermal influences contaminate grinding oils during the manufacturing of precision tools. The fluids could not be used for long periods without high performance ultra-fine filtration. Temperature and foreign particles would compromise process reliability and quality. For this reason, ultra-fine filtration plays a key role in the overall machining process for tool manufacturers in terms of cost and quality, as do premium quality blanks, state-of-the-art grinding technology, and high-precision grinding wheels.

VOMAT in Treuen, Germany is the filtration specialist and technical manager Steffen Strobel says: "Filtered grinding oils are an important component in the value chain and should therefore not be underestimated. The longer the finely filtered grinding oil can remain in the system in almost fresh oil quality, the more benefits the tool manufacturer will gain in respect to increased quality and reduced costs.

"For example, the fewer particles in circulation, the lower the abrasion of the

grinding wheel during tool grinding. The grinding tools last longer and more drills or cutters can be ground with one disc. In addition, the downtimes of machines are reduced because the grinding wheels and the grinding oil does not have to be changed as often.

"With VOMAT technology, the tool manufacturer is on the safe side. Because our high-quality pre-coat filters, operate in full flow filtration and separate the dirty and clean grinding oil 100 percent. This provides nearly fresh oil quality in the 3-5 µm range (Nas 7) over a very long period of time. Long service life of grinding wheels as well as high process reliability, and operational stability of the entire manufacturing system are the rewards. In addition, the tool manufacturer saves grinding oil costs and minimises drag-out losses thanks to innovative technology."

Depending on production requirements, VOMAT supplies stand-alone filtration systems as well as large industrial central systems and integrates them precisely into the respective production workflow. Different filter, cooling and disposal technologies ensure economic and ecological success and harmony.

One example is the VOMAT FA 960 (dimensions: 2,500 mm x 1,400 mm x 1,500 mm) with an oil capacity of approximately 2,400 litres and 960 litres/minute filtration capacity. Depending



on the amount of dirt, the high-performance filters are automatically back-washed as required, which has a positive effect on the filter durability and the energy usage. The high-precision temperature controls guarantee +/- 2 K accuracy, which guarantees the medium has a long service life. It also prevents temperature related expansion of machine components and the workpieces to be ground. In addition, there is an intelligent, fully automatic recycling system for the carbide sludge, which has a residual moisture content of around 5 to 10 percent. The patented "Sedimentator", disposes the sludge directly into a disposable transport container ready to be picked-up by the recycling companies.

Steffen Strobel: "Tool manufacturers are confronted with the high-quality demands in today's markets. Drills, milling cutters, reamers and threading tools, etc. must be manufactured within extremely narrow tolerances. Optimally filtered grinding oils are an important mosaic piece in the overall manufacturing process and contribute to the fact that high quality micro to extra-large dimension tools can be ground economically."

With the FA 960 from VOMAT, for example, clean oil in 3-5 µm (NAS 7) is provided by ultra-fine filtration systems. Stand-alone systems or large industrial central systems can be optimally adapted to any workflow.

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## New automated filters launched by Eclipse Magnetics

Eclipse Magnetics has announced the launch of the new Autofiltrex range of cost-effective, automated filters. Available in three different sizes with features including fully automated cleaning and a magnetic reclaim unit, the Autofiltrex range is ideal for most ferrous machining applications such as grinding, honing, lapping, forming and quenching. Described as the latest generation in cost-effective, high performance filtration, the Autofiltrex was exhibited at the EMO exhibition in Hannover, where it received high levels of interest and great feedback.

Eclipse Magnetics sales and marketing director Steve McAllorum says: "We were delighted to see that the Autofiltrex was a popular product on the Eclipse Magnetics stand at EMO. Not only did we receive plenty of enquiries and requests for more information, we also received a good amount of orders from manufacturers looking to improve efficiencies for precision metal finishing processes. The Autofiltrex is a great example of how an investment in magnetic technologies can improve efficiency in automotive and other metal finishing operations."

The new Autofiltrex range can be fitted in-line or off-line, ensuring 24/7 "ultra-polished" fluids and delivering considerable advantages over traditional filter media. Its modular design also allows additional units to be added to accommodate increased flow rates, depending on application needs. Offering sub-micron filtration performance, the Autofiltrex range delivers cleaner fluid to the machine, therefore improving surface finish and accuracy as well as reducing expenditure on filter media.

As a "plug and play" device, minimal setup is required, and the system can be fully integrated with CNC controls for ease of use to provide 24/7 uninterrupted filtration. In addition, the option of an additional waste reclaim unit is also available to enable a fully automated system with waste disposal. The Autofiltrex is available in three sizes; the AF1 (no reclaim unit), the AF3, and the AF5, each occupying minimal floor space with the capacity to increase fluid life by up to 10 times.

For more information on how Eclipse Magnetics's innovative magnetic filtration can help your business save money, increase productivity and minimise waste, visit <https://promotions.eclipsesemagnetics.com/autofiltrex>, where you can find out more, or schedule a free consultation with a dedicated team of qualified engineers, with no obligation or commitment.

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## Stainless steel filters you can rely on

Axium Process has developed its range of hygienic stainless-steel filters, ensuring ease-of-use, simple maintenance, dependability and outstanding quality is at the forefront of its design.

The standard filter range is available with short delivery times in order to meet customer demand and has a 90 degree or in-line housing option with fully interchangeable and replacement elements. The elements, which can be safely removed without specialist tooling, cleaned or steamed in place and quickly put back into service reducing unnecessary downtime, are available in wedge-wire, sintered mesh and perforated tube providing a filtration range from five microns up to 8,000 microns.

Axium's filters provide a reliable solution for critical applications such as a pre-filter for pumps or debris capture for CIP. The popular wedge-wire design is widely used for applications where product consistency and smoothness are essential and for powder dispersing applications.

The sintered mesh screen is ideal for high

or low-temperatures and is used in the pharmaceutical, food and beverage industries for the removal of suspended solids, micro-flakes, fibres and for glass contamination prevention. For process security duties or coarse filtration applications, the company's perforated tube screen provides a robust and flexible solution.

Where more complex filtering is required, Axium's innovative filter systems can provide improved process efficiencies and substantial cost savings by reducing downtime, maintenance and screen renewal costs. The filter's robust construction enables automatic or manual backflush facilities which can be fitted to the filter without fear of damaging the elements.

Axium's filter systems include duplex, triplex and multiplex options and are engineered to give a small footprint, high



flow rates and substantial dirt holding capacity. Systems can be customised with support framework, sample points, drainage, vent valves and pressure gauges.

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# Metal finishing and deburring - Ellesco has it covered at MACH

Ellesco, the UK's leading supplier of metal finishing and deburring systems, will maximise its 200 m<sup>2</sup> stand at MACH 2020 with exhibits from its world leading industry partners Timesavers, Autopulit and WMS. On show will be a mix of machines and systems that highlight the versatility available from Ellesco, ranging from grinding and deburring, through polishing and general surface finishing, to weld dressing and blending. The comprehensive display will feature manual, semi-automatic and fully automated robot integrated systems.

Central to the Ellesco stand will be a selection of machines from Timesavers, whose range of deburring and wide belt grinding machines deliver deburring, precision grinding and edge rounding to the highest quality creating the perfect finish for sheet metal and plate components, large and small.

Making its UK exhibition debut will be the Timesavers 42-Series 1350 HWRB machine equipped with the revolutionary Hammer Head<sup>®</sup> heavy slag removal system, this is combined on the show machine with edge deburring and radiussing heads. This



Above: The Timesavers 42 Series

Below: Hammer Head heavy slag removal system



The combination of abrasive belt and rotary brushes on Timesavers machines

specification is ideal for the processing of heavily-drossed flame or plasma cut parts up to 1,350 mm wide (1,600 mm option), with the ability also to process a wide range of laser and punched materials including stainless steel, aluminium, carbon steel, zinc coated and laser film products.

The second Timesavers machine on show is the mid-range 32-Series, which will be demonstrating the ability to accurately and efficiently deburr laser-cut components. Ideal for deburring, edge rounding and/or finishing of different materials. Like its larger cousin, the 32-Series is equipped with Timesavers' Rotary Brush technology. The use of a vacuum table as standard means that very small, lightweight parts can be processed, with the whole cycle being monitored from the angled control panel and the large window. Other standard features include an 1,100 mm working width, LED beam on the infeed side that indicates the machine status, frequency-controlled motors for process control and ease of changing the brushes which can be specified to suit a wide range of materials and duties. Completing the efficient operation is the automatically adjustable table height of between 0 – 100 mm and conveyor speeds variable between 0.2 to 8 m/min.

Concluding the Timesavers line-up at MACH is the 12-Series, the baby of the

range. Available in working widths of 225 and 600 mm, the 12-Series is perfect for deburring and finishing sheet metal parts. The machine can be equipped with an abrasive belt, cylinder brush or rotating disc, or a combination, with the grinding belt removing vertical burrs and subsequent roller brush or disc operations eliminating side burrs, while producing edge breaking at the same time. The 12-Series can automatically adjust the table height between 1 - 75 mm and frequency-controlled drives maintain workpiece flow at anywhere between 3 - 9 m/min. The show machine will be presented in abrasive belt + nylon web roller brush format for deburring, edge-breaking and brush, surface finishing.

A completely different approach to deburring is demonstrated by the WMS Engineering robot concept appearing on the stand for the first time. This is designed for the precision deburring of parts by taking the part to the tool, the tool to the part, or a combination dependant on application; tools comprise high-speed (9,000 rpm) mills, drills, brushes, stones, abrasive wheels, really any rotary consumable. WMS doesn't restrict itself to just rotary tooling to achieve results. WMS Engineering's modular approach to system build means that it can efficiently produce complete turnkey solutions to a customer's deburring requirements. The versatility of

the WMS system is that it is equally at home processing internally and externally machined components, as well as automatically monitoring the results of its work, with the robot manipulator able to precisely position the edge to be deburred.

For those looking for solutions to their weld dressing processes the fully automated robot cell from Autopulit provides the answer. The robot cell on display at MACH 2020 highlights the ability of Autopulit to deliver belt grinding for weld dressing, finishing and paint preparation solutions tailored to an individual customer's requirements, by utilising robots to position work of around single or multiple abrasive/polishing stations, or to manipulate consumables around a component. An almost limitless combination



Autopulit weld dressing robot cells offer major productivity gains

of axes, consumables and handling set-ups streamlines workflow and delivers consistent, high quality, results. Quality is maintained through use of sensors that detect and compensate for any geometrical deviations in the workpiece caused by the welding process. The key advantages of the Autopulit system are its ability to efficiently manage short or repetitive batches, while significantly reducing cycle times compared with a manual process. Furthermore, the system allows for a variety of parts to be processed in-line, without need for setup changes as different tools can be selected by the system according to the process requirement.

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WMS robotic deburring system



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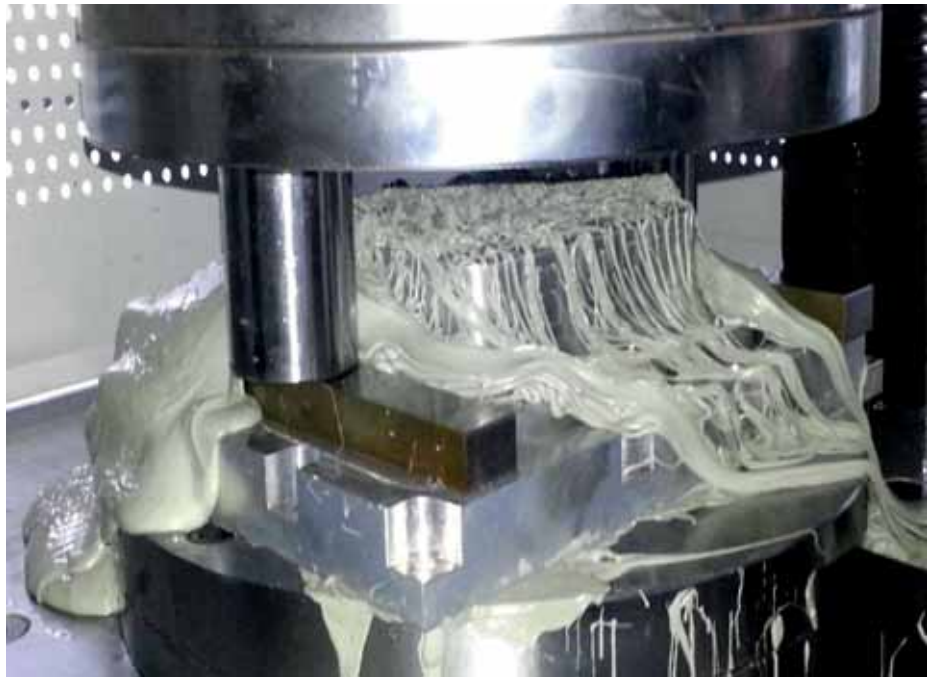




# Component quality masters the balancing act

Many industrial sectors are currently undergoing future-oriented change. There can be no question that characteristics such as burr-free parts, surface finish and cleanliness have a decisive influence on component quality. As the only international trade fair for deburring technologies and precision surface finishing, DeburringEXPO presents corresponding offerings in a concentrated and comprehensive fashion which is unparalleled by any other event. The 3rd leading trade fair for deburring technologies and precision surface finishing which took place at the Karlsruhe Exhibition Centre in October last year featuring valuable know-how at its bilingual expert forum. The next event takes place from October 12 to 14th 2021.

Whether it be the automotive industry, aviation and aerospace, machinery manufacturing, medical engineering, metrology, precision engineering, sensor technology, tool and mould making or the automotive supplier industry is involved, these and other sectors are currently facing, or are already in the midst of significant change. As different as the challenges may be, one aspect is becoming quite clear: The quality of components is determined to an ever greater extent by freedom from burrs and a requirements-oriented surface finish. The execution of production steps for deburring, rounding and the production of



Abrasive flow machining (AFM), also known as flow grinding, is used on conventional as well as additively manufactured components for deburring and the production of precision surface finishes

precision surface finishes is thus becoming an increasingly decisive competitive factor.

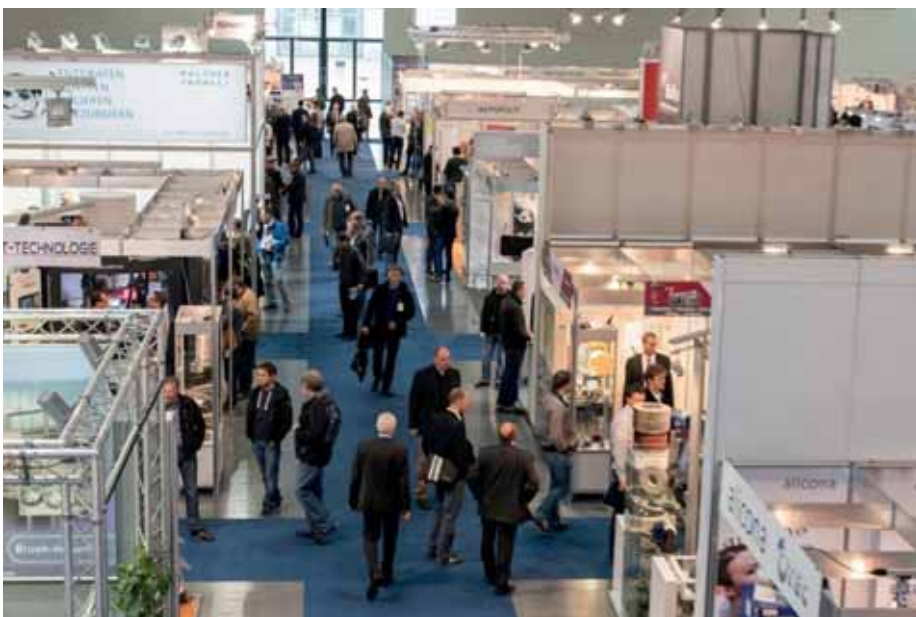
"Amongst other things this is made apparent by the fact that, as opposed to earlier strategies, manufacturing businesses now concern themselves with these tasks and look for appropriate solutions already during the product development phase,"

reports Hartmut Herdin, managing director of fairXperts GmbH & Co. KG and promoter of DeburringEXPO.

With their leading trade fair for deburring technologies and precision surface finishing, the organisers have created a globally unique information and communication platform which permits targeted and efficient comparisons of various technologies and performance levels within a focused framework. In the fields of deburring, rounding and the production of precision surface finishes, the event presents concentrated and comprehensive offerings which are unmatched by any other technical trade fair anywhere in the world. Among other features, these offerings include world's firsts and innovative solutions which permit effective deburring and cleaning of components in a single process, for example. Technologies are also presented by which components can be manufactured entirely burr-free, as well as solutions for the automation and digitalisation of deburring and surface finishing processes.

**Smaller, lighter, more precise, improved functionality**

Component and application-specific surface finishing requirements vary greatly from



By concentrating technologies, suppliers and solutions within a focused framework, DeburringEXPO provides an overview that can't be found at any other trade fair



industry to industry. For example, the automotive industry and its suppliers are looking for solutions that can further reduce emissions and increase the performance of internal combustion engines, whether they're used alone or in combination with electric motors in hybrid vehicles. On the other hand, they require burr-free components for electric drives, where even the smallest production residues can lead to malfunctions or short-circuiting. Other areas in which burr-free components are absolutely essential for flawless operation include everything from driver assistance systems right on up to autonomous driving. Stricter requirements for surface quality are resulting from the trend towards ever stronger and



lighter materials, as well as increasingly high-performance power trains, in the aviation and aerospace industry.

Manufacturers of technical medical products are faced with new challenges, amongst other factors due to the new MDR (Medical Device

Regulation) which becomes binding on 25 May 2020 after a three-year transition period. For the first time ever, particles are identified in the regulation which can be caused, for example, by burrs.

Reliably deburred workpieces are a basic prerequisite where increasingly stringent particulate cleanliness requirements need to be met, for example for precision parts in the PCB supplier sector, for measuring technology and in the optics industry. Regardless of the industry sector, the quality of downstream processes such as joining, sealing, coating and assembly can usually only be assured with the help of burr-free, appropriately finished surfaces.

DeburringEXPO also addresses the issues of post-processing for additively manufactured parts. This involves the removal of support structures and residual powder, as well as smoothing and polishing rough, porous surfaces and preparation for subsequent heat treatment or coating.

## Bilingual Expert Forum - know-how and knowledge as added value

DeburringEXPO offers a great deal of knowledge and know-how with its supplementary programme. Theme parks covering the issues of parts cleaning after deburring, the process sequence for sheet metal deburring and post-processing of additively manufactured parts provide information on current developments and trends. Due to its highly practical orientation, the three-day expert forum integrated into DeburringEXPO is an extremely popular source of knowledge. The focal points of the simultaneously interpreted presentations (German <> English) include fundamentals, approaches to process and cost optimisation, reports on best practice applications and current trends, as well as special content provided by the theme parks. Practical examples and benchmark solutions make it possible to gather ideas and inspiration for optimising one's own processes. Participation is free of charge for visitors at the leading trade fair.

Further information is available at [www.deburring-expo.de](http://www.deburring-expo.de)

**fairXperts GmbH & Co** Tel: 0049 7025 84340  
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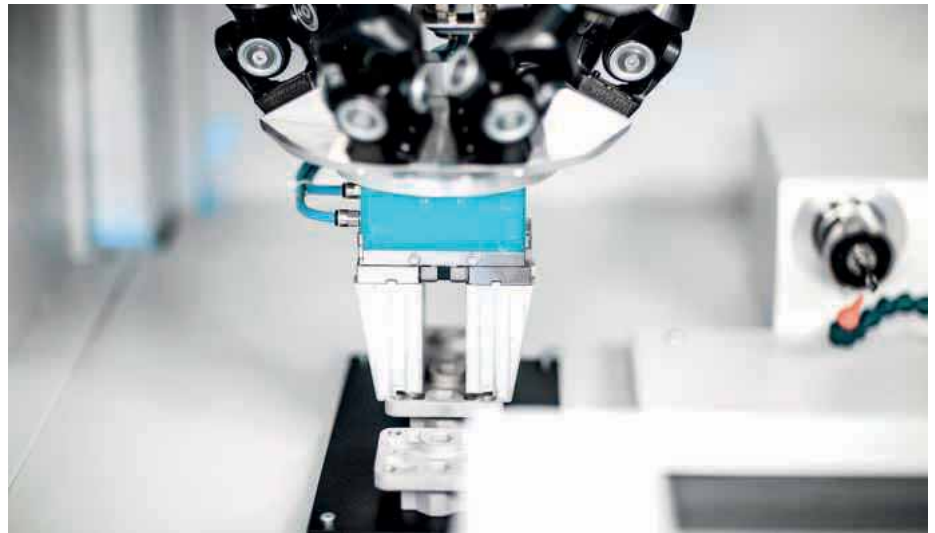
## Benefit from modern deburring technology

The specialists from gKteso GmbH have been at home in the area of ultra-modern deburring technology for many years. The company's products and wide range of services will help you to optimise your processes. Since burrs, i.e. splinters, sharp edges or fraying, occur during the mechanical processing of metal parts, measures are required to remove them completely. gKteso provides you with high-quality machines for precise deburring, which ensure a greater process reliability.

### Customised deburring machines

Whether in mechanical engineering, in the hydraulic and automotive industry or in another industrial sector, if an excellent deburring machine is required for production or for finishing your workpieces, then you are definitely in the right place with gKteso. Within deburring technology, modern machines increase the quality of the workpiece and, after punching, casting or machining, they ensure smooth edges. Deburring occurs here automatically in the form of brushing and/or grinding, even for medium and large quantities. Lengthy retooling processes are eliminated thanks to the flexibility gKteso's deburring systems.

While primarily defined edges could be automatically deburred before, the development of deburring machines has now advanced so much that there are also efficient solutions for undefined edges. In this way, there is no more elaborate deburring by hand! And that streamlines production: On the one hand, the automated processes occur faster and more transparently than deburring by hand. Alternatively, many companies have their parts for deburring driven through Europe



by truck for cost reasons, always in search of low cost providers for manual finishing.

### Deburring technology in your own company saves costs

Significant travel times and transport costs are eliminated if this work step can take place directly in your own production halls thanks to the automated deburring technology. In addition, the administrative effort for the material flow is reduced and closed highways, traffic jams at the borders or cumbersome customs clearances no longer play a role. A machine developed by gKteso for industrial finishing is able to carry out the deburring of boreholes, threads, gears and other tasks and even perform smaller checks. Even complex parts

can be safely deburred on different workpieces with the deburring system. A residue-free deburring is crucial for products for the automotive industry in particular. No chips or particles from the previous work steps may remain in cylinder heads or valve manifolds. Even removing internal or enclosed burrs is no problem with



a high-quality deburring machine from our production. A machine with five degrees of freedom is used here, which effectively and reliably deburrs, brushes or grinds even difficult-to-reach places.

To find out more about gKteso's deburring technology, visit the website where you can find out more about the first-class deburring machines and which models suit your particular applications, as well as the company's excellent consultation service.

**gKteso GmbH**  
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**[www.gkteso.de](http://www.gkteso.de)**





## New deburring range from Kemet reduces machining times by 90 percent

During most machining operations, components become burred and sharp edges or material compression occurs. This affects the quality of the part and can create issues with assembly and also failure of parts due to break off of material during working life. Removal of burrs is often critical to many of the lapping and polishing processes Kemet develop for customers, to prevent damage to lapping/polishing support materials and extend their life.

Kemet always monitors technical developments around the world and is delighted to be able to now offer a comprehensive deburring solution in the full range of Xebec deburring and polishing products. These cater for either hand use or for in process, CNC/Robotic use, with tailored products for the full range of deburring challenges.

Xebec brushes use unique abrasive ceramic fibre material instead of abrasive grains. The content ratio of ceramic fibres is an impressive 80 percent giving exceptional grinding power with a consistent cutting performance throughout the life of the

brush. This is a real advantage compared to abrasive impregnated nylon brushes, where performance drops off over time, resulting in increased process times and much higher frequency of brush replacement.

The Xebec products also maintain their shape for their full working life unlike other deburring materials that deform quickly; this improves the consistency of finish and eases management of them as a consumable on a mass production line.

The Xebec Deburring range includes special tools for a range of deburring applications: tools for deburring after face-milling, end milling and drilling; threading and drilling, as well as polishing brushes to remove cutter marks on top surfaces, side, inner diameters and channels.

In addition to the ceramic brushes, Xebec also offers a range of Back Burr Cutters specifically for deburring front and back of drilled or tapped holes. These are supplied with a custom-made tool path so there is no additional programming needed by the user. Coordinates are supplied along with the tools for your specific application.



Thanks to this custom-made path, the cutter cuts into a 3D curved edge with the optimal cutting angle ensuring no secondary burrs are generated. The tool life is dramatically extended by continuously shifting the contact point of the cutting edge. In tests these tools have been proven to cut machining times by up to 90 percent.

**Kemet International Ltd**  
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# Kemet

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## We can knock off your rough edges

Always looking to help our customers refine their competences and techniques, Kemet now offer the XEBEC range of Deburring Tools for use with CNC machines and robots.

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# A belting solution

The metalcutting industry, whether the process be laser, plasma, waterjet or punching, all have a common need for high quality deburring and edge rounding. It is LOEWER's mission to constantly provide the most innovative and advanced solutions available for customers. The company therefore travels the world to find the best machines available. While there are a host of different machines with varying levels of technology, many have a number of disadvantages i.e. high cost outlay or worse still poor build quality, large footprint, expensive consumables, operator unfriendly, ineffective and so on. LOEWER's products address these issues.

The BeltMaster K4TD is equipped with one abrasive belt unit followed by two oscillating disc units, each with two large rotating discs, making it ideal for grinding, deburring, edge rounding and oxide removal. The abrasive belt unit can be equipped with the unique LOEWER floating head system. The combination of abrasive belt unit and 4TD disc technology makes the BeltMaster K4TD the versatile solution for graining, deburring, edge rounding, oxide removal or orbital finishing.

Features comprise: abrasive belt unit offering graining or deburring with infinitely variable abrasive belt speed; two disc units in the centre, two disc units on the outfeed side; oscillation stroke larger than width of feed belt; uniform 360° edge rounding from all directions on inside and outside contours;

uniform wear of disc tools, independent of the size of the workpiece or its position on the feed belt; speedy change of tools when using different materials; great versatility due to large selection of disc tools for different applications.

Possible applications include: graining in decorative straight-line finish; deburring – coarse edge rounding – edge rounding fine; deburring – edge rounding – oxide removal; deburring – edge rounding – orbital finish; processing of plasma-cut, laser-cut or waterjet cut parts; deburring and edge rounding of 3D punched parts; deburring of small parts from Ø 20 mm; processing of foil-coated or zinc-coated sheet metal; processing of steel, stainless steel and aluminium.

The workpieces are placed on a conveyor belt. The abrasive belt will remove higher burrs. Two rotating discs in the centre of the machine followed by two rotating discs at the outfeed side oscillate continuously over the full width of the workpiece. Inside and outside edges are processed from all angles and directions. The result is uniform deburring and edge rounding independent of the orientation of the cutting contours. It is possible to use different disc tools in the centre and on the outfeed discs, depending on the application.

The belt unit uses either abrasive or nylon belts. For the disc unit, LOEWER offers a



great variety of disc tools. Depending on the application, the disc unit will be equipped with the appropriate combination of disc tools.

The abrasive belt unit removes burrs or creates a grinding finish. A large variety of abrasive and nylon abrasive belts are available for different applications. The speed of the abrasive belt can be changed by frequency converter.

Technical data: maximum working width 1,350 mm; shortest workpiece length 20 mm; material thickness 0.3 mm - 80 mm.

Established in 1976, Engineering Utilities is a second-generation family business specialising in supplying equipment and consumables for metal preparation, finishing and cleaning to a diverse range of market sectors throughout the UK, Ireland and overseas.

With a solutions-driven approach, it has developed a well-earned reputation for providing an efficient, integral and reliable service. It regularly sources bespoke machines and equipment based on customers' specific requirements, bringing first-class innovation to the sector. This ensures that the company maintains its unrivalled reputation for offering outstanding service, expert advice and quality products at competitive prices.

This commitment to quality has led to Engineering Utilities owning the exclusive licences to distribute a number of innovative products including Eisenblatter, TIG Brush, Boeck, NS Maquinas and the revolutionary Loewer in the UK and Ireland.

## UK Distributor:

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## Versatile grinding and edge rounding machine from Lissmac



Designed and manufactured in Germany, the SMD 3 series combines the versatility in the application with the widest possible range of processing parameters. It is the universal machine for post-processing of cut metal sheets, in particular for subcontract manufacturers and their daily changing requirements. Four rotating brush heads create the uniform edge rounding on all sides of outer and inner contours and guarantee a perfect edge rounding of up to a radius of 2 mm as well as creating a non-directional finish. The SMD 3 impresses with its robust and compact design and offers an optimal accessibility for the cleaning and maintenance. This is a non-vacuum table machine, giving an energy consumption saving of up to 50 percent compared with vacuum table machines.

Other characteristic features of SMD 3 include: processing of small parts from 50 x 50 mm independently of the geometry of the part; no vacuum table necessary; up to 50 percent energy saving against vacuum table machines: the simultaneous processing of different material thicknesses is possible; suitable for different materials, such as stainless steel, aluminium, zinc, steel, etc.; intuitive operating with a touch panel; constant working height (conveyor remains at the same height as input and out conveyors); frequency-controlled motors; first grinding head (R) 2-18 m/s; automation / integration in production lines is possible.

### SMART GRINDING - process-optimised and resource-efficient deburring

Added value through the SMART deburring machines includes: reduced setup times; low handling effort; maximum support and relief for the operator; automatic correction of the processing parameters; integration in production cells / processing lines with laser or stamping machine; data and signal exchange; remote maintenance / predictive maintenance.

Additional information can be found at [www.lissmac.com](http://www.lissmac.com)

#### UK Distributor:

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**Tel: 01202 830844**

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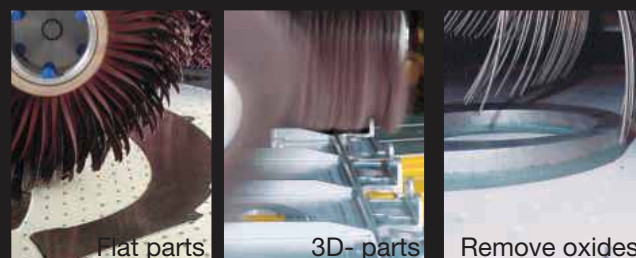


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# Meeting new working practices

Surtech introduces new polishing and grinding machinery to meet latest health & safety demands

Machines for grinding, polishing and surface finishing have been around since the industrial revolution. For many years, UK industry has been reliant on old traditional designs that no longer meet current health and safety legislation. New working practices and modern developments in abrasive and polishing consumables have left companies with pre-war designed machines leading to inefficiency and low productivity.



In response to on-going industry demand, Surtech have partnered with one of Europe's leading manufacturers of polishing, grinding and finishing machinery. The machines benefit from modern guarding, current electrical specifications and controls, after sales service and spare parts support. The range extends from both bench to pedestal machines covering all the most common power ratings in both 400V three phase and 230V single phase. They can be optioned with extras such as twin speed motors, emergency injection motor brakes, electronic inverter speed controls and built in dust extraction units.

The range covers products to cover both the needs of small workshops up to production shift work with warranties from three years up to 10 years depending on model chosen. A selection of

machines is available to view and test at Surtech's long established demo and test centre in the heart of Birmingham.

Surtech was formed in 1973 to specialise in the manufacture, design and distribution of mechanical surface finishing equipment and materials. Within this field it aims to provide the latest available technology from anywhere in the world. The company's international reputation is extensive. It is constantly reviewing the needs of our customers and tailors the product range accordingly.

The Surtech workshop and repair department is staffed by competent factory trained engineers and equipped to handle servicing, repairs and modifications of all machines. It also has its own abrasives test centre. With a warehouse facility covering 15,000 sq ft, Surtech offers a complete 'one-stop-shop' for abrasive belt machines, polishing machines, finishing materials and accessories, stocking what is believed the largest volume available in the UK.

Boasting the UK's largest selection of the very latest new and used grinding, deburring and polishing machines and materials, you are invited to bring your own components and to discuss your requirements with Surtech's skilled engineers, who will also set up practical demonstrations. See for yourself how our machines can be used to solve problems and to improve efficiency.

Alternatively, visit Surtech's online Ebay shop "Online-Abrasives" to purchase a selection of our products.

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## Engis hand lapping plates and compounds for valve reconditioning

Engis portable hand lapping plates and compounds have been developed specifically to provide the fits and finishes required for reconditioning valves, extending valve-life and reducing production downtime.



Engis incorporates the latest composite lap plate technology in its hand lapping solutions, offering a range of lapping plate materials suited to different functions, from rapid stock removal to fine surface finish. Engis standard lap plate material is HY Composite Copper.

The lap plates, which are available in a range of diameters, are usually supplied with cast iron backing plates to provide weight and stability, but other materials are available if required.

Engis offers complete lapping systems including machines, lapping plates, accessories and consumables including Hyprez Diamond lapping compounds and lubricants to get the job done "right first time", all supported by Engis technical advice and expertise.

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## Easy automation of sanding tasks

Sanding applications for collaborative robots normally require many inter-communicating hardware and software components. Integration is complex and time consuming but thanks to RARUK Automation, there is now a quick and easy solution. New to its Robotiq range is an all-in-one sanding solution designed specifically to work with Universal Robots.



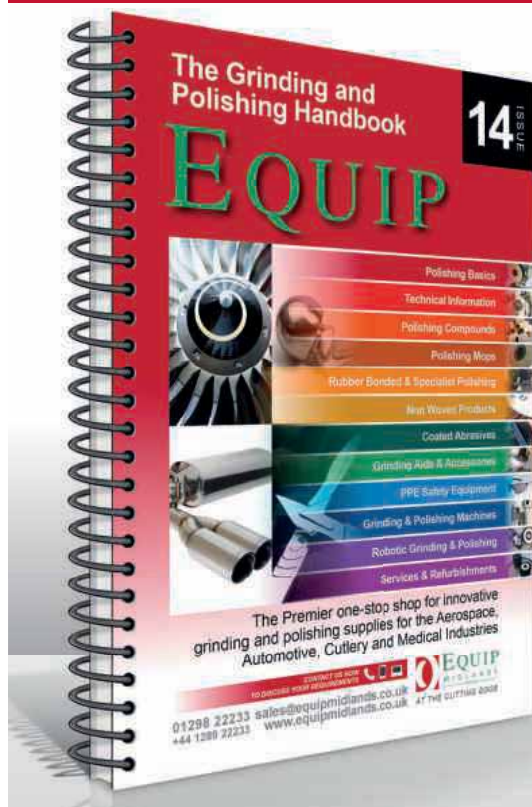
Not only is the new Sanding Kit easy to integrate, it also reduces programming time from hours to minutes. Quality of finish and productivity are increased and risk of sanding injuries minimised. The new addition can be used to finish wood, plastics, metals, fibreglass, carbon fibre as well as solid surfaces.

Watch it in action at: [www.rarukautomation.com/collaborative-robots/sanding-kit/](http://www.rarukautomation.com/collaborative-robots/sanding-kit/)

The Robotiq Sanding Kit can be fitted to any of the Universal Robots from RARUK Automation. The company supplies three sizes that are easily integrated into existing production environments. With six articulation points and a wide scope of flexibility, these collaborative robot arms are designed to mimic the range of motion of a human arm. All e-series models are compliant with CAT3 PLd, the standard that ensures products are safe for human/machine collaborative tasks.

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## The Grinding & Polishing Handbook Issue14



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# A passion for precision

With linear motors and support for micro tools

Some companies seem to be made for each other. If high precision is a top priority for both, then it's only a matter of time before they join forces and this is exactly what happened with Rollomatic and Inovatools. The Swiss grinding machine manufacturer and the tool expert from Kinding-Haunstetten, Bavaria, have been working together since 2002 and with increasing success, as impressively showcased in the production facilities, which are equipped with 24 Rollomatic machines.

Founded in 1990 by Georg Eckerle and Ditmar Ertel, Inovatools is now one of the top 20 tool manufacturers in Germany. Since then, state-of-the-art machinery, a dedicated R&D technology centre, an in-house coating centre and, last but not least, highly skilled personnel have helped them to maintain this strong position.

### Everything under one roof

Regular investments in technology ensure that Inovatools is always state-of-the-art, with recent acquisitions including three new GrindSmart®630XS grinding machines from Rollomatic. "These 6-axis specialty machines are intended for our special tools division, and with a total tool volume of 40 percent, is very strong, not least thanks to our express service. This enables us to ship a custom-made product anywhere between 0.1 mm and 32 mm in just one week. These made-to-order tools feature a special carbide substrate as well as customised coating and tool geometries," says Jochen Eckerle, head of production at Inovatools.

"This is all possible thanks, among other things, to our internal vertical integration, allowing a variety of customer requirements to be satisfied. Our positioning enables us to respond quickly to market changes so that we are always ahead of the game," adds Martin Schulze, head of Standard Production at Inovatools. An in-house R&D department, a demonstration and test centre as well as a 5-axis machining centre provide the basis Inovatools needs to quickly adapt to new challenges."

### Since the beginning: investing in precision

In an industry in which ultra-high precision is increasingly the deciding criteria in purchasing, there is no room for



Excellent collaboration (from left to right): Daniel Seitz, team leader in Micro Tools Production at Inovatools; Uwe Hirschenberger, technical sales and customer service at Rollomatic SA; Martin Schulze, head of Standard Production at Inovatools; Jochen Eckerle, head of production at Inovatools; and Damien Wunderlin, head of sales at Rollomatic SA

compromise. This is why back in 2002, Inovatools entered into a partnership with Rollomatic with a one cylindrical grinder and a single tool grinding machine.

"We were instantly impressed by the machines. In our eyes, there was no other manufacturer as an alternative choice, particularly in the micro tools segment," says Jochen Eckerle. Schulze: "Of course, we have also looked at some of Rollomatic's competitors on the market, but it would not have made sense for us to leave behind such a great concept like Rollomatic technology just to step into another one."

As a result, both companies grew in tandem: whatever Inovatools needed, Rollomatic did everything it could to deliver. "This went beyond a traditional supplier relationship and has developed into a strong partnership. Rollomatic knows us and understands that we often need to be flexible in our response. If we have a problem or need to upgrade a system, Rollomatic makes it possible. That is what you call excellent collaboration," says Jochen Eckerle Schulze.

### Like no other in the market

What Inovatools values in Rollomatic

machines is their reliability in automation processes, its repeatability in precision, and its maintenance-friendliness. Schulze also appreciates the sincerity of the manufacturer: "When Rollomatic says they can do something, they really do deliver, whether we're talking about, for example, precision or short setup times."

Inovatools' standard portfolio includes milling tools with a straight face from 0.1 mm or from 0.2 mm with a corner radius. "Our special tools include milling tools with a diameter of 0.07 mm or 0.15 mm with a corner radius. Our drilling tools start at 0.5 mm. Multi-steps tools used to present us with major challenges, such as corner radius transitions. But now, thanks to the new



Complex multi-stepped endmills are a specialty of GrindSmart®630XS and Inovatools



version of the VirtualGrind®Pro grinding software from Rollomatic, these problems have disappeared because the program does much of the calculation work by itself. This saves the operator an enormous amount of time," says Jochen Eckerle Schulze.

### Three cheers for the linear motor

A total of 24 Rollomatic tool grinding and cylindrical grinding machines are used at the Kinding-Haunstetten location. Recent additions include two GrindSmart 630XS, a six-axis precision tool grinding machine with linear motors. "In terms of surface technology, the 630XS offers major benefits thanks to its linear motors. The production is even more stable than with previous machine generations and it's also much quicker to warm up after a cold start. Among other things, the coolant and lubricant used for the linear motors is the same as the oil used for cooling during grinding. This ensures constant thermal stability," says Daniel Seitz, team leader in Micro Tools Production at Inovatools.

But this is not the only benefit of the linear actuator. In the words of Uwe Hirschenberger, who works in Technical Sales and Customer Service at Rollomatic: "When you consider that mechanical wear with ball screws starts from day one, the longevity of the linear motors can't be an underestimated factor. Without friction and friction forces working in opposition, wear is non-existent and dimensional stability is always very high."

At Inovatools, the GrindSmart 630XS tool



Jochen Eckerle Schulze, head of Standard Production at Inovatools, appreciates the sincerity of the manufacturer: "When Rollomatic says they can do something, they really do deliver, whether we're talking about, for example, precision or short switchover times. And this is precisely how we set ourselves apart from the competition."

and cutter grinders are used mainly for applications with special profiles as well as stepped endmills in the special tools segment. "The outstanding dimensional stability and surface qualities have proven themselves in this area in particular," adds Jochen Eckerle Schulze.

### Autonomy? Bring it on!

Autonomous production is the future, even at Inovatools. And this is supported by the high reliability and process stability of Rollomatic machines. "We can design our tools with much narrower tolerances because we push the GrindSmart grinders to their limits. This means that we can easily

grind 0.3 mm tool diameters and keep them all within a tolerance of 3 µm. This is no problem for the machine."

### Versatile support for customers

However, Rollomatic is not satisfied with simply being a supplier of high-precision grinding machines, the Swiss company also wants to offer the best possible customer support. When asked how he rates Rollomatic here, Martin Schulze has nothing but praise: "A big thumbs up! When it comes to both technical and software support, the service we receive is precisely what we'd hoped for. And any problems that do happen to arise are quickly resolved. Free and easy-to-install software updates are especially customer-friendly."

Remote system maintenance is now standard as well. "The next stage for us will be to record and evaluate all the machine data with an aim to achieving enhanced planning and machine utilisation among other things. Rollomatic is also supporting in this aspect, too," says Jochen Eckerle Schulze. "In the years ahead, the goal will be to digitalise and automate production. We are also looking to further enhance our quality standards and to tap into additional markets. We see major potential in the medical technology and aerospace industries in the future."

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The Rollomatic department at Inovatools in Kinding-Haunstetten. A total of 24 cylindrical grinding and tool grinding machines are in service here



# New tool sharpening machine for small diameters

Industry leading sharpening specialist VOLLMER has now launched its new VGrind 340S grinding machine. Complementing the existing VGrind series of machines, the new VGrind 340S has been specially developed for producing and re-sharpening extremely small carbide tools with diameters from 0.3 mm to 12.7 mm.

Drills and milling cutters in this size range are in particularly high demand in the automotive, electronics, connector and medical engineering sectors, where assembly spaces and components are becoming smaller and smaller. The automation options on the VGrind 340S allow tool manufacturers to confidently use this exciting new machine tool for unmanned production around the clock.

### Optimum machining of small diameters

The VGrind 340S grinding machine, which sharpening specialist VOLLMER first presented at EMO 2019, enables the highly efficient machining of thin carbide drills and milling cutters that are primarily used in car manufacturing, the electronics industry and medical engineering. These sectors call for increasingly compact products, featuring metal or composite components that need to be machined with extremely small tools. Electronic components and medical devices are requiring increasingly delicate machining by manufacturers.

### Tried-and-tested VGrind technology

The VGrind 340S grinding machine is not just suitable for producing rotationally symmetric tools, but also for re-sharpening them. The VOLLMER machine relies on the tried-and-tested VGrind technology to achieve this functionality. It features two

vertical spindles for different grinding wheel sets, which makes it possible to reduce non-productive times. Five perfectly harmonised CNC axes achieve interpolation with short travel distances for the linear and rotary axes. These machine kinematics reduce non-cutting times and the subsequent time required to machine workpieces. In addition to the rotary axes, the linear axes are also designed as direct drives (linear drives) for the first time. Unlike ballscrews, these axes are non-contact drives and are therefore not subject to wear, increasing the service life, precision and longevity of the new arrival. The VGrind 340S also features a steady rest to ensure optimum tool concentricity during grinding whilst a back rest is also available as an option for longer drilling tools.

### Intuitive operation and optional automation

The proven and intuitive NUMROTOplus software enables a three-dimensional simulation of the tool production process and makes it possible to carry out collision monitoring in advance. The height-adjustable and pivoting touchscreen control desk and the generously



dimensioned view of the machining space makes for ergonomic machine operation.

Optional solutions for automation, such as the HP 160 pallet magazine or the HPR 250 free-arm robot, ensure that precision machining of up to 900 tools with different shank diameters can continue unattended around the clock. The VGrind 340S features a replaceable dressing device for the grinding wheels to achieve optimum concentricity and axial run-out for the wheel packages. An optional probe enables in-machine grinding wheel calibration and offers the option of recalibrating the handling mechanism as often as required. A sticking unit enables the abrasive coating to be opened during production. In addition, the wheel coolant nozzles can be replaced automatically, just like the wheel packages themselves.

"We are expanding our tool grinding range with the VGrind 340S to support tool manufacturers in developing extremely small machining tools," says Dr Stefan Brand, CEO of the VOLLMER Group. "Machining small tool diameters requires a great deal of finesse, which we have been able to achieve through digital and

mechanical solutions. Actuation via five CNC axes and the use of back rests guarantee precise machining in the micrometre range."

With its comprehensive range of machinery, the VOLLMER Group, which has sites in Germany, Austria, Great Britain, France, Italy, Poland, Spain, Sweden, the USA, Brazil, Japan, China, South Korea, India and Russia, enjoys global success as a tool machining specialist in terms of both production and service. The technological leader's range of products contains the most advanced grinding, erosion and machine tools for rotary tools and circular saws in the woodworking and metalworking industries, as well as for metal-cutting band saws. In offering this, VOLLMER relies heavily on the company's tradition and its strength. Local contacts facilitate efficient communication channels, quick decisions and rapid action by a family-run company.

The VOLLMER Group currently employs approximately 800 workers worldwide, with around 550 of these at the main headquarters in Biberach alone, including more than 50 trainees. The company invests around eight to ten percent of its turnover in



the research and development of new technologies and products. As a provider of technology and services, the VOLLMER Group is a reliable partner to its customers.

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# Ewag's Laser Line Ultra pushes the boundaries of laser-processed micro tooling

As users in the electronics, medical and micromechanics industries, for example, continue to push the boundaries in terms of miniature products, Ewag, a member of the United Grinding Group, has likewise continually developed its laser-based machining technology to meet these demands.

The company's Laser Line Ultra machining centre, available in the UK from Walter Ewag UK, is unrivalled in the laser 'fabrication' of cutting tools including spiral tools from 0.4 mm to 3 mm diameter and made from hard/ultra-hard materials such as tungsten carbide (WC), polycrystalline diamond (PCD), chemical vapour deposition diamond (CVD-D) and cubic boron nitride (CBN).

The machine can be successfully applied to cutting edge preparation, post-sharpening, chip breaker and cylindrical margin fabrication as well as to the laser-modification of ground cutting tools. Complex micro geometries can also be machined due to the machine's eight-axis kinematic concept and the use of an industrial laser source that emits pulses in pico-seconds.

For example, a four-flute PCD end mill can be produced from cylindrical blank with its primary and secondary clearance faces machined at both at the tip and circumference. The corners at the edges are protected by a chamfer and, as with all lasered spiral tools, the result is a smooth and uninterrupted interface between PCD and WC.

Laser processing removes material in line with thermal-based mechanisms, and because the Laser Line Ultra uses ultra-short laser pulses and appropriate laser machining parameters, the resulting pulse is so short that there is insufficient time for a significant amount of heat to conduct into the cutting tool, so there is negligible heat-affected zone.

Carbide drill bits laser-fabricated by the machine can subsequently be coated (by the physical vapour deposition process) with a single layer of TiAlN or AlTiN alloy and the coating processing method is the same as that applied to ground cutting tools.

Ewag has worked closely with two of



The evolution of a carbide drill bit on the Laser Line Ultra, from left: 0.5 mm diameter carbide blank, 0.45 mm diameter drill after laser processing and the drill after TiAlN then AlTiN coating

Switzerland's foremost surface technology companies to ensure successful coating and together they have used a number of inspection methods (such as optical microscopy, scanning electron microscopy, energy-dispersive x-ray spectroscopy, hardness indentation tests and destructive break tests) to validate the process.

In terms of micro drills, for instance, the advantages of using laser technology compared to conventional techniques, include: diameter-to-length ratios of up to 1:20; the ability to process additional small features such as tip thinning and tip chamfers; there's no tool breakage and no need for a steady-rest because lasering is a force-free process; the process enables a high degree of geometrical flexibility since brazed plate-based tools and spiral tools can be fabricated without retooling.

On spiral micro tools, the lasered surfaces are homogenous and do not show any form of directional feed marks compared to the ground surface. Furthermore, the surface quality of the lasered WC surfaces is 20 percent better than the ground WC drill bit.

For lasered PCD surfaces, excellent surface quality is also achieved and in general, lasered spiral tool surfaces, regardless of material, exhibit surface roughness values for Ra and Rz of <0.25 micron and <1.5 micron, respectively. Cutting edge radii are typically ≤5 microns and are symmetric with a K-factor typically



equal to  $1 \pm 0.2$ . In terms of diameter stability, a tolerance of  $\pm 0.005$  mm can be achieved in a 12-hour production run in climatic-controlled conditions.

Going forward, based on the Laser Line Ultra's success in producing complex micro cutting tool geometries, Ewag is continually improving the process (laser processing and the machine's software) for the fabrication of CVD-D and CBN spiral tools, with the former, for example, producing a four-flute polycrystalline CVD-D end mill and with the latter, laser-turning from a solid cylindrical blank a PCD tool for chip-free machining of carbide and tool steel, producing mirror finishes and chip-free hole expansion for ultra-precise diameters.

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MACHINE TOOL ACCESSORIES

# Change the way you think about tool manufacturing

by Lucas Hale, global marketing manager at ANCA CNC Machines

Does moving towards the smart factory mean scrapping your existing CNC grinding machines and having to invest in a whole new set of machinery? Not at all, but it does mean upgrading some of your technology and changing the way you think about how you operate.

Visit ANCA at GrindTec 2020 **Hall 7 Stand 7045** to see practical, working solutions that could be operating for you tomorrow, solutions that will extend unattended production, improve quality and ultimately deliver improved returns to boost your bottom line profit.

In the factory of the future, running won't require you to be as hands on with what you produce anymore. Instead of a manual production line, you will have an integrated network of machines that is more efficient in manufacturing processes, intellectual property generation, tool design, customer responsiveness, cycle time, profitability - the list goes on. Across your business, automated machines will take care of more of the laborious tasks before work begins.

Don't let the enormity of what you can achieve with a smart factory cause you to stick to what you have always done because it is easier. With a bit of investment to upgrade your existing technology and facilities, you can reap the benefits of automation.

It is about working with a CNC grinding machine that is smarter. Of course, this will need some investment, but it is also about understanding how the new infrastructure will work. The benefit for your team is that instead of needing to manufacture products with manual intervention, your team will be

able to program machines ahead of time, so that they are able to do what needs to be done throughout the day. Not only will your CNC machines then manage the production, they'll also collect and analyse data and make automatic adjustments to production in real time to improve the way you're running.

### All your CNC grinding machines need to be connected

While you will be able to make use of existing CNC machines, it will require you to embrace some new technology. To work effectively with other machines and maximise the benefits of a smart factory each CNC grinding machine will need to be connected to a communication network.

Having a machine connected to a network may seem daunting, but the benefits are unparalleled. Your CNC machine becomes part of a smart, connected set of tools working together to make your work easier.

Depending on the age of your machine, you can connect machines using either WIFI (the best option-to avoid messy cabling) or a cabled LAN connection. While newer machines come WIFI enabled, older machines can be retrofitted with a WIFI adaptor and software drivers. Check with your vendor first to make sure the driver software is supported.

### Exploit your niche, finesse your offering and charge accordingly

As a small company, you're able to offer a personalised service bigger business can't. You understand your customers' needs. You



sell the precise product they need to keep their operation running. They need you as much as you need them.

So being small can be your greatest selling point. You can adapt to the market as it changes and respond to demand. Where potential customers may be frustrated by businesses with long lead times, you can have the ability to turn things around quickly and with more flexibility. Customers wanting something you don't manufacture yet can even be an advantage. With the tools and flexibility to make it happen, you can easily expand your offerings and show them how well you understand your niche.

This kind of specialisation is hugely valuable to a business. You're not only providing labour and materials but access to years of knowledge and refinement. It's been shown that customers will pay more for specialised products that offer this level of added value.

### Embrace automation

Most CNC machines, including those that we produce, already come equipped with comprehensive, advanced software that allows flexibility in everything from configuring setup to adaptive processes like



product gauging and automatic compensations, freeing your team to work on more valuable tasks.

By creating automated systems and processes, you'll immediately have access to more information than ever before. This is a huge benefit for you and your customers. Your machines will be able to alert you when you're running low on materials. They will predict maintenance that's required to keep them operating, so you avoid lengthy and expensive disruptions.

Better still, they can become part of a wider network of machines. Integrating with other factories will reinvent your supply chain process. Suddenly, your factory can integrate with your customers and your machines can speak to one another. Is your customer running out of a product you manufacture? The machine at your end can find out and start the production process without any intervention from you.

#### Move forward one step at a time

Don't worry. You don't need to do all of this at once and there are easy ways to add automation functionality:

Add after-market software or hardware

accessories, such as lasers to measure tools in production and make sure they're meeting required design and tolerances.

Retrofit with automation, robotic loaders mean lower costs and greater volumes. You can have a new robotic loader at a reasonable price installed into your machine to achieve the benefits of lights out or unattended machine production.

Enable machine connectivity on older machines through WIFI adaptor and software drivers to connect machines to each other and the wider factory.

Store tool files centrally with tools and wheel servers. Maintaining a database of each tool file that a machine can use for setup and are a great place to start with software. Your factory can store a whole range of files centrally, so each machine can access what it needs to get the process going.

#### Planning ahead for future success

This might be brand new for your factory and there are tricks you will need to learn. For example, did you know that if you're moving jobs between machines, you will need to have the same version of software

on each? Again, this is an investment, but the efficiencies will weigh out the costs in a few months. It is about knowing what will be required to make your factory smart.

If scaled manufacturing is not your background, you might need more information before you scope out your strategy. We can help you understand your specific requirements and help you understand how to incorporate them into your supply chain.

Whatever approach you take, you will need to invest in some degree of technology to keep your machines up to date and your operation functioning effectively. Without this, other companies will move ahead of you as they can produce more complex tools more efficiently.

There are many ways to bring your CNC grinding machines up to speed for your smart factory. The most important thing is that you start.

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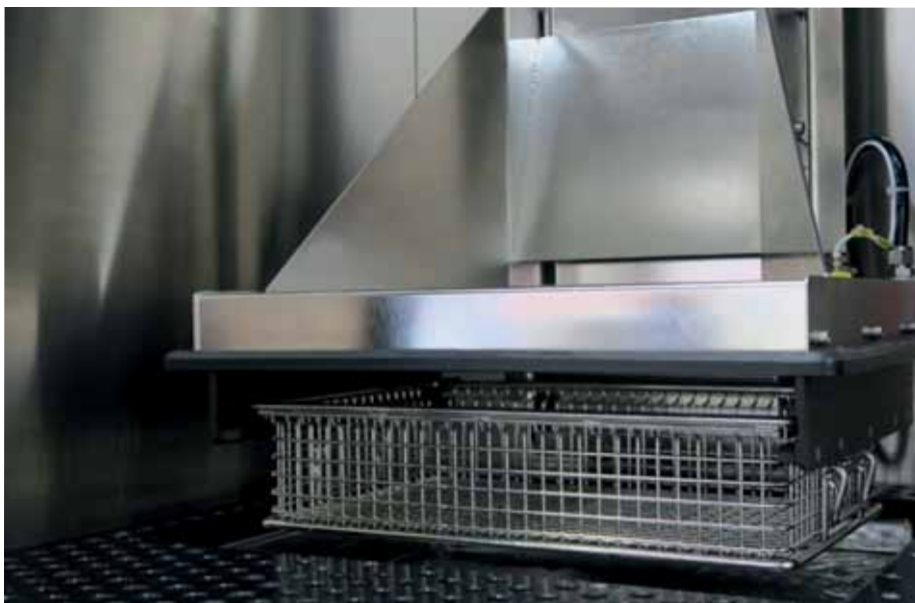


# Ultrasonic cleaning of product carriers in a cleanroom

## Explosion-proof ultrasonic cleaning solution for the pharmaceutical industry

Stringent cleanliness requirements in the manufacture of pharmaceutical products also extend to production resources and tools. To ensure that product carriers are thoroughly cleaned with high quality and process reliability, an international pharmaceutical company has invested in a new cleaning system. In addition to task-specific cleaning media at the correct temperature, the system uses ideally coordinated ultrasonic components to achieve specified cleanliness levels quickly, efficiently and reliably.

Pace-Tec GmbH of Furtwangen (Germany) specialises in special machine construction for wet chemical production processes. The service portfolio of the Black Forest company includes process consulting and the development, design and manufacture of wet chemical production systems. The machine builder delivers customised solutions to high-tech companies working in semiconductors, solar technology, medical engineering and the pharmaceutical, automobile and aerospace industries.



Along with the cleaning medium used, the ultrasonic technology ensures that the required cleanliness results are achieved with high process reliability

### Cleaning system for pharmaceutical product carriers

When the cleaning equipment for product carriers was to be replaced at an

international pharmaceutical firm, the solution designed by Pace-Tec won out over the competition. During production, parts of pharmaceutical products are transported in the carriers made of plastic, stainless steel and a combination thereof. The production resources and tools have to fulfill tough cleanliness requirements in order to rule out contamination of the products. The objective of the investment was improved cleaning quality and process reliability. The cleaning system was installed in a Grade D cleanroom in compliance with Good Manufacturing Practice (GMP) guidelines. For reasons related to the previous cleaning processes, the media i.e. ethanol and isopropanol and the use of ultrasound were specified.

"The available space required high power density in a small area. Furthermore, given the prescribed solvents, the system had to be explosion-proof," says Philipp Bauer, B. Sc. Medical Engineering, who is responsible for technical sales at Pace-Tec.

### Clever construction for high process reliability

The cleaning system has three stations, two of which are tanks with a volume of about



The facility for cleaning the goods carriers is equipped with two cleaning stations and one drying station and is integrated in a cleanroom

# Component Cleaning

25 litres each for cleaning with the two previously mentioned solvents and a third station for drying. The expenditure for explosion protection was reduced to the absolute minimum with a clever geometric design of the system and ingenious air ducts. Where necessary, partial nitrogen purging and the use of suitable sensors and actuators ensure safety.

Equipping both cleaning tanks with ultrasound proved to be rather challenging, given the limited installation space and the required high-power density. The project managers at Pace-Tec discussed this assignment with a number of manufacturers of ultrasonic components before selecting Weber Ultrasonics as partner. "The technical skills and consulting competence of Weber employees were crucial factors in our decision. Furthermore, our customers know Weber, a company with a good reputation," explains Philipp Bauer.

## Ideally adjusted ultrasound technology

Weber Ultrasonics designed the complete ultrasound technology to match the Pace-Tec specifications for frequency of 40 kHz and output of 2,400 watt per cleaning station. Forty-eight 50-watt truncated cone vibrating elements were installed on the floor of each tank. "Given the limited space for installation of the tanks, Weber also equipped the hard-to-reach places with elements. Once the first tank was made available, the company carried out tests in the in-house technical centre to make sure that the high power density would be achieved," says Philipp Bauer.

Digital frequency generation and regulation are handled by two Sonopower 3S generators of the 4th generation. With



The ultrasonic technology is managed via the Profinet interface integrated in the generator in the HMI for the complete system



Forty-eight vibrating elements are installed on the floor of each of the cleaning tanks. They reliably deliver the required high output of 2,400 watts (Photos courtesy of Weber Ultrasonics AG)

these innovative single-frequency systems, a very homogeneous sound field is achieved by the combined frequency and amplitude modulation and the formation of "standing waves" is prevented. Consequently, the ultrasonic effect is increased so that the cleaning processes can be carried out more quickly and efficiently. The Sonoscan also makes its contribution to the consistent acoustic power. It automatically determines the working frequency prior to ultrasonic activity and sets up the system accordingly. During the processes, the frequency can be monitored continuously and adjusted automatically as needed. It is thus ensured that work is always done with the most efficient power even under varying operational conditions such as temperature fluctuations or changes in cleaning and rinsing media. As adjustments or a change of frequency can be made while the system is operating, the cleaning process is not interrupted.

The generators are equipped with an optional Profinet interface. "That allows us to integrate ultrasound management in the Human-Machine Interface (HMI) of our system, which requires the exchange of high data volumes. We also can simplify process data management over this interface," says Philipp Bauer.

## Fully automated cleaning process in the cleanroom

Depending on their size, the product carriers are cleaned as bulk material or set goods. Transport to the cleanroom and

through its channels is automated; the cleaning system is loaded manually. After the carrier-specific cleaning program is selected, the process runs automatically according to fixed parameters. The cleaning tanks are again manually removed from the output point and forwarded via an automated system to product manufacturing. "Besides the cleaning medium and the entire system concept, the ultrasonic technology is largely responsible for the fact that our customer is very satisfied with the cleaning results and process reliability. He has already ordered a second system," concludes Philipp Bauer.

Weber Ultrasonics AG develops, produces and markets solutions and components for the industrial use of ultrasonic technology. Its business field focuses on cleaning, welding and cutting with ultrasound and also includes other special applications. The Group, which is DIN EN ISO 9001 certified, has won several awards for its exemplary management. The family-run medium-sized business with headquarters in Karlsbad (Germany) employs a staff of 130 around the world.

More information at [www.pace-tec.de](http://www.pace-tec.de)

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# Reducing cleaning costs with individually adapted services

Optimised equipment availability and process reliability improve efficiency

To guarantee continuous and consistent cleaning results, it is essential that cleaning can be planned. For this, a system has to function in an optimal way and fluctuations in the process or unscheduled downtimes must be avoided. A service concept that is tailored to the requirements of the equipment user and implemented in close cooperation with the manufacturer helps to achieve this. Therefore, Ecoclean has developed a wide range of services that can be individually combined.

In all industrial sectors, component cleaning plays a major role when it comes to product quality and added value. If equipment does not function according to plan or if a cleaning system suffers unscheduled downtime, this usually has negative consequences, such as the return of faulty goods or disruptions to production or delivery processes. The result is increased unit costs, which are detrimental to profitability and competitiveness.

### Optimised process quality and equipment availability

If process quality and the availability of the cleaning system are always kept at an



Remote service provides fast and efficient remote assistance in the event of malfunctions. The new service app enables two-way exchanges via video calls with transmission of live imagery

optimal level, related costs and image damage can largely be avoided. Ecoclean has developed a comprehensive portfolio of services and products for this purpose. The services offered range from advice during

the planning of a new system to ensuring the availability of the system throughout its entire service life, as well as assistance in optimising cleaning processes, adapting the system to new requirements and improving energy efficiency. In the global service network of the equipment manufacturer with its locations and agencies, more than 125 customer service employees take care of around 5,000 installed systems.

### Individually combinable services

Regular maintenance is key to ensuring consistently high process quality and system availability. To meet the wide-ranging requirements and wishes of equipment users, regular service agreements can be tailored to respective needs. In this way, maintenance can be carried out during a 'controlled production downtime' when it suits and at minimised cost.

If a malfunction needs to be rectified quickly, Ecoclean customer service is available 24 hours a day, seven days a week. Remote service enables experts with in-depth process and system knowledge to access equipment remotely, analyse the cause and help solve the problem at a time



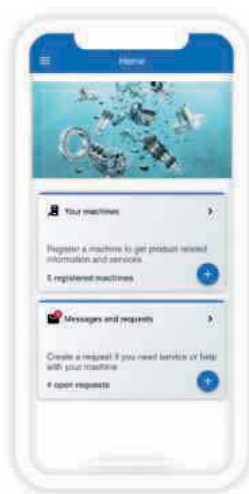
Regular maintenance is key to high process stability and equipment availability, as well as preservation of a system's value. Regular service agreements tailored to the individual situation and requirements of the equipment user ensure optimal reliability at affordable costs



arranged with the user. Of course, faults can only be rectified fast if the equipment user has the necessary spare and wear parts in stock. For this reason, the customer service staff also recommend which spare parts should be procured for the respective system. If worst comes to worst, they make sure that the required spare and wear parts are shipped quickly anywhere in the world.

## New service app for fast and efficient communication

The new service app for IOS and Android was launched in January 2020 and permits two-way exchange between equipment users and Ecoclean customer service employees via video call and chat functions. The information and instructions required for troubleshooting or system maintenance can be transmitted directly by smartphone. Using the phone's camera, helpdesk employees can follow the work closely and intervene immediately if something goes 'wrong'. The normal phone and chat



function can be used to answer questions immediately or to clarify instructions. This state-of-the-art form of service support minimises the need for long and costly trips. It not only reduces equipment downtimes but also CO<sub>2</sub> emissions.

The SBS Ecoclean Group develops, produces and markets forward-looking

machinery, systems and services for industrial part cleaning and surface treatment applications. Its globally leading solutions help companies around the world in conducting efficient and sustainable manufacturing to high quality standards.

The client base comes from the automotive industry and its suppliers in addition to a broad range of market sectors ranging from medical equipment, micro technology and precision devices through mechanical and optical engineering to power systems and aircraft industry. Ecoclean's success is based on innovation, cutting-edge technology, sustainability, closeness to the customer, diversity and respect. The Group employs a workforce of about 900 people at its twelve sites in nine countries worldwide.

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## Layton develops a new quicker cleaning process for ceramic components

A world-renowned manufacturer of advanced technical ceramics components approached Layton Technologies Ltd with a requirement to rationalise the cleaning and drying process used on ceramic components destined for the medical device industry.

The client operated a time and chemistry heavy cleaning process carried out in two separate systems which were in excess of 20 years old and they had already identified the substantial risks to their operation due to increasing issues with the reliability of the ageing systems.

It had a long list of requirements for the project, with the main focus being the ability to manage their forecasted increased throughput, which was in excess of 10 times the current throughput, whilst at the same time ensuring that they maintained a scrupulously clean process to medical device standards and provide a high degree of safety for both the environment and operatives.

The list also included increasing yields, removing the requirement for the multiple operators of the current systems, reducing

energy usage, increasing throughput and removing any need for the use of hazardous chemistries.

Layton was tasked with developing a streamlined automated process which would meet all of the above requirements. In addition, due to the extremely fragile nature of the product, it was necessary to ensure that no damage occurred to them during the cleaning and drying process.

In addition to the client's already lengthy wish, any new system had to provide a high level of functionality to improve process control and data collection.

Extensive, customer witnessed, trials were conducted to rationalise the current process and to ensure a clean and dry end product. Due to the fragile nature of the components, tests were developed with the client to ensure that all contamination was removed, and the parts sustained zero damage.

An extensive Technical Proposal was produced which included for automated processing, complete system enclosure, automated chemical dosing and monitoring and data logging this satisfied the concerns



that the client had expressed as to the overall ability of the new system to meet the requirements of the project.

At the same time as the main system design and manufacture Layton undertook the design, development and manufacture of a specialist fixturing to hold the components and to optimise the cleaning and drying process.

The final design resulted in a new, fully automated, multistage cleaning and drying system complete with Layton's unique five year warranty.

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# Technology meets chemistry

Why having the right balance is critical for component cleaning

When it comes to the cleaning of engineered components, it's often considered that the physical washing machine is the only important part of the process. Cleaning additives and detergents are merely a supporting element. For MecWash, one of the leading innovators and manufacturers of aqueous parts cleaning systems, the approach has to be about three crucial elements: the technology, the chemistry and the product that is being cleaned.

"It's quite easy for a company to go out and acquire a washing system without understanding the importance not only of the chemicals required, but the impact they can have on the substrate of the component being cleaned," says John Pattison, managing director of MecWash, based in Tewkesbury, Gloucestershire. "It's not just about knowing what contaminants have to be removed. The combination of an intense washing system with an inappropriate mix of chemicals and detergents could damage the substrate and lead to the cleaned component's failure."

MecWash has invested heavily in its own laboratory at its headquarters to develop, design and formulating chemicals for common and bespoke component cleaning applications.

### So how does the process work?

MecWash works with a customer to understand the type of components being cleaned and what results are required. Analysis and trials then allow the correct wash process and chemistry to be defined. The process begins with an audit of the customer's cleaning requirements. This is thorough and covers key areas including:

- The substrate of the components being cleaned
- Are the components metallic, non-metallic or hybrid?
- What is the type of contamination?
- Do the components need to be brightened as well as cleaned?
- Are the components as cast, machined, polished or a combination?
- The geometry of the components and critical features
- What is the cleanliness specification?



- What is the process directly before the wash process?
- What is the process directly after the wash process?
- Does the component need to have any long-term corrosion protection after the wash process?
- What is the size and weight of the components?

Physical analysis is also undertaken. This includes: chemical compatibility with substrate; removal of contamination from the component's surface; removal of the contamination from the process solutions; millipore testing; ravimetric analysis; surface energy tests (for example water break; visual inspection or bespoke tests.

"The process is intense and thorough. It has to be to ensure the complete system and process will remove the contaminants to the highest levels possible without damaging the components during or after the washing process," explains John Pattison.

"It could take days or months, depending on the type of product or process and the end results required by our client and their customers. Manufacturers in the aerospace, automotive, fluid power and medical sectors are ever more demanding."

### Adapting to clients' needs

MecWash continues to work with a client long after a chemical solution has been identified.

"We have to work hand-in-hand with a client as their products can change, or the manufactured make-up of the product could alter," says John Pattison.

"Our customers are dynamic in their approach to manufacturing and we have a flexible approach in order to continuously optimise their processes, even if the machine has been on site for several years."

### New processes and technology

Changing processes and new technology has seen the washing process change over the years. The design of the washing systems and the evolution of chemicals has increased the ability of such systems to remove contaminants to a fraction of what they were capable of 10 or 20 years ago.

Hellerman Tyton is one of MecWash's customers who have benefited from the skilled work of the laboratory team. The cable management solutions specialist now achieves high quality component cleaning, within strict temperature constraints. The company uses a MecWash Midi wash system with an integrated Aqua-Save wastewater recycling system at its production centre in

Devon. The cleaning system has been configured to wash a temperature sensitive plastic component, while avoiding the risk of product shrinkage.

Lina Ficken, engineer team leader at Hellerman Tyton, says: "It's important that, following the expansion process, mouldings are comprehensively cleaned before further handling and assembly processes, not least to remove a silicone coating used during the manufacturing process.



"Our customers apply the cable protection systems on site via the application of heat which shrinks them into position. Temperature is clearly a factor that needs to be tightly controlled during manufacturing.

"MecWash has been able to configure the cleaning system so that wash temperatures are held at no more than 40°C which, in conjunction with the tailored AC33 chemical solution that the company was able to develop for us, ensures that all material leaves the cleaning process in the optimum condition."

John Pattison of MecWash adds: "MecWash worked closely with the Hellerman Tyton team for many months, developing the AC33 chemical, which is formulated to clean the plastic components effectively at low temperatures.

"MecWash's expertise in wash chemistry is based on years of designing tailored chemicals for the most testing wash challenges for individual customers, as well as manufacturing our own range of general wash chemicals and inhibitors."

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 systems for particularly difficult cleaning challenges. World class parts washing technology

MecWash parts washers are used in the aerospace, automotive, fluid power, general engineering and medical industries. MecWash 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.

For more details about MecWash's range of aqueous washing systems, contact:

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## Libelle Product Control from BvL detects position deviations

Reliable, thorough parts cleaning plays a crucial role in production processes across all industries. The more precisely the nozzles are directed at the component to be cleaned, the more efficient cleaning is possible. Precise loading of the workpiece holders is particularly important for components with complex geometries. Even undercuts, edges and very small holes then no longer impede thorough cleaning.

With an addition to the sensor system product line under the name Libelle Product Control, cleaning manufacturer BvL Oberflächentechnik provides an essential prerequisite for a perfect cleaning process. With the help of the "Position Monitoring" app, the system counts and checks the elements to be cleaned. This allows the Libelle Product Control to detect the number of loaded components and their position. If a component is missing or was placed in the workpiece holder slightly offset, the sensor system signals the corresponding information to allow correction.

Libelle Product Control can be integrated into a Yukon continuous system or Niagara



**The NiagaraDFS basket system from BvL offers optimum integration options for the Libelle Product Control**

basket washing system, for example. During customised manufacturing of the respective cleaning system, detailed photographs are already taken of the respective component as part of the teaching process. The ambient conditions are just as important for the function as the individual customer requirements regarding output of the results and control of the cleaning system, adapted to the existing cleaning process.

In addition to the currently available "Position Monitoring" application, the technical options of Libelle Product Control



**Libelle Product Control uses the "Position Monitoring" app to detect incorrectly positioned components on the workpiece holder**

allow additional applications which are currently undergoing intensive further development at BvL. This is always driven by the objective of continuously increasing the quality and process reliability of parts cleaning.

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# Line operation of AGTOS drum shot blast machines

The optimum integration of the blasting systems into the industrial process is a key factor. The drum shot blast machines are perfect to link them

There is a wide variety of parts that can be treated in drum shot blast machines, ranging from delicate, small parts such as fasteners up to compact castings. For use in foundries, special modules for the separation of the casting sand and abrasive are added to the machines. To find the appropriate machine concept depends, among other factors, on the workpieces' size, the required performance and on your concept regarding an ideal production process.

If there is no way to find a solution using a standard machine, the German manufacturer can offer you a tailor-made blast machine concept.

The workpieces are in a normal box, which will be placed into a feeder or is directly emptied. The feeder will be lifted and arrives in front of the machine door, which opens immediately. Arriving at the right height, the feeder swings and unloads the work pieces into the drum. According to the sensitivity of the work pieces this process can be made with caution. The control can be made by PLC or manually. Through this, damage is avoided. At that time, the drum is in the loading position. Before the blasting process, the machine door closes and the drum swings into an optimal position in front of the high-performance turbine, simultaneously it turning around its own axis.

The blasting process starts and lasts as long as the workpieces are mixed and blasted from all sides. The interior of the blasting cabin is equipped with materials that are very resistant against abrasives. The primary wearing in the direct blasting zone of the high-performance turbines is made of high-resistant, replaceable steel plates. During the blasting process the door keeps closed and could only be opened after the cabin has become dust-free. That takes around 10-15 sec. Slight low-pressure exhausts the dust during the blasting process. The dust will be separated in the appropriate filter unit.

After the blasting process, the drum swings into the unloading position. At this position it is also possible to determine the quantity of the workpieces and the intensity of unloading by using a dosed emptying.



The treated workpieces arrive on a screen conveying trough which separates the residual abrasive and transports the pieces to forthcoming boxes.

### Capabilities and applications

It's about highly modern machines according to a well-trying principle. Because of many new technical details, the new AGTOS drum blast-machines are convincing. This unit type is very capable for treating bulk material. Compared with the widely used band belt principle there are many important advantages.

Since the drum is made of one piece, crossings from flexible and fixed machine parts are avoided, i.e. clamping of workpieces is avoided. Furthermore, drums can easily and completely be emptied, that avoids double treatment of each workpiece. Due to wear resistance perforated manganese steel is used. The size of the holes depends on the dimensions of the workpieces as well as on the graining and the quantity of the effluent abrasives. Sophisticated devices support the mixing of the workpieces.

AGTOS was founded by a special group of individuals who live and breathe surface technology. Supported by a highly qualified staff, this group of experts is at the heart of the AGTOS team. AGTOS was introduced to the market in October 2001.

The AGTOS team can draw on an enormous wealth of experience in the development, construction, manufacturing and marketing of turbine-wheel shot blast equipment.

State-of-the-art production facilities at the company's plant in Poland and a complete warehouse facility at the headquarters in Emsdetten, new facilities, a streamlined organisational structure and a high degree of team motivation make it possible for AGTOS to manufacture machines and blasting units with the same consistently high quality at an economical price. This equipment lineup is complemented by a complete program of services focused on blasting technology.

AGTOS offers shotblast equipment which is tailor-made for diverse requests. It places special emphasis on providing perfect service for customers. This applies not only to the blasting equipment it manufactures, but also to other makes of equipment.

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# Guyson blast cabinet etches busbars

Guyson International, the UK leading industrial finishing equipment manufacturer, has recently installed a specially configured Guyson Euroblast® 7PF (Pressure Fed) blast cabinet into one of the world's leading designers and manufacturers of switchgear and instrumentation. The cabinet is to provide a blast etched surface, on their range of high voltage busbars, to improve adhesion of a special non-conductive coating.

The company's existing blast cabinet system had suffered from several operational problems, so the search was on for an improved solution with better blast media handling and operator efficiency. With three tenders in place, the operators and maintenance manager visited Guyson's 'Component Finishing Centre' at Skipton to try out Guyson's proposed manual blast system on their components. "All of the operators bought into the Guyson blast unit straight away and it was their unanimous preferred option" says the maintenance manager.

The chosen Euroblast 7PF blast cabinet is from Guyson's premier industrial quality range and delivers exceptional component access, with doors opening to the front, top and side, and so facilitates easy loading of components. In fact, with the blast chamber being oblong rather than square in shape, it proves a popular choice amongst customers for blasting longer components. But due to the length of some of their copper, silver and tin electro-plated busbars being even longer than the width of the Euroblast 7PF cabinet; a special cabinet design was needed.

This was drawn up, in 3D CAD, by Guyson's in-house design team and incorporated a 700 mm extension box on the left hand side of the cabinet, supported by legs and a cut out profile in the right hand door (with blanking door to prevent media escape) so that longer busbars can be fed into the cabinet for selective blast etching. The remainder of the pressure fed blast system includes a Guyson's G27 pressure pot, C800 twin cartridge dust collector and a 'High Efficiency' cyclone. This latter item is designed to remove the majority of dust and fines from reaching the dust collection unit, thus extending the life of the filter cartridges between changes.

Guyson Euroblast PF systems are



The Guyson Euroblast 7PF blast cabinet with extension box and high efficiency cyclone

designed for speed, giving faster cleaning times (up to four times faster than suction fed or venturi systems) to meet higher production requirements and at peak demand this blast system can be working for the entire length of a full shift so it is necessary that the blast system quickly produces a perfectly keyed surface for the powdered coating to adhere to in the oven.

Guyson International Limited is a privately owned family company with a worldwide reputation for excellence in the design and manufacture of blast finishing, spray wash and ultrasonic cleaning equipment as well as being the UK supplier for all your hose and coupling requirements.

Formed 80 years ago, the Head Office is located at Skipton, North Yorkshire, while the company's Hose & Couplings division is based in Guiseley near Leeds.

On the Blast and Wash Division's impressive 10,000 square metre site, Guyson designs and manufactures all its bead blast, spray wash and 'Kerry' branded ultrasonic cleaning equipment. You will also find under the same roof well-equipped sales, testing and demonstration facilities, as



well as central warehousing and distribution for all spare parts and blast media.

Whatever your blast cabinet requirement Guyson will have the answer. Contact Guyson's Customer Service Department now to arrange free blast trials on your components, prove the process and make recommendations on the most suitable cabinet for you:

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## Accurate Brazing adds second hot isostatic press

Accurate Brazing, a full-service provider of specialised heat treatment solutions, added Hot Isostatic Pressing (HIP) to its thermal processing capabilities early last year.

Both presses are of the model QIH 122 M URC®. They are equipped with the Quintus proprietary uniform rapid cooling (URC) feature, which combines HIP and heat treatment in a single process. This process is called High Pressure Heat Treatment (HPHT), and it streamlines the steps involved in material densification and heat treatment. This innovative approach also enables all processed components to cool uniformly, resulting in minimal thermal distortion and non-uniform grain growth.

"The Quintus technology allows us to shorten lead times, improve product metallurgy and eliminate some additional outside operations, which is very attractive to our customers," says Steven Francis, president of Accurate Brazing.

Accurate Brazing serves the aerospace and power generation industries, as well as other sectors that demand high quality and

short lead times. Many of Accurate Brazing's customers utilise additive manufacturing (AM).

The new QIH 122 M URC will join the first Quintus press and the rest of the state-of-the-art equipment operating in Accurate Brazing's newest facility in Greenville, S.C., USA. The company's AS9100 quality management system and Nadcap accreditation attest to its ability to meet the stringent needs of its customers.

Quintus will install and commission the new press. Accurate Brazing has also joined the Quintus® Care program, which ensures flawless press operation and optimized functionality at a fixed annual cost. Quintus Care also provides access to in-depth technical expertise to support successful customer applications.

Both Quintus presses are configured as Quintus Modularised Solutions, which reduces infrastructure investment and saves space and energy. Both presses offer a work zone of 26.0 inches (660 mm) in diameter and 68.9 inches (1,750 mm) in height. They



operate at a maximum temperature of 2,552°F (1,400°C) and a maximum pressure of 30,000 psi (2,070 bar).

"The need for Hot Isostatic Pressing is steadily increasing, and we're pleased to help Accurate Brazing meet this demand," says Jan Söderström, CEO of Quintus Technologies. "Quintus Technologies has led the industry in advanced Hot Isostatic Pressing technology for over 60 years, so Accurate Brazing and its customers can rest assured that they are using the best equipment available."

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# Higher productivity, ease of handling and no nickel

New Henkel solutions enable greater cost-efficiency and sustainability in aluminum anodising

Henkel's pipeline of innovations for the aluminum industry does not stop short when it comes to anodising, one of the most established technologies of aluminum processing. In complementing its latest developments for optimising the conversion coating of aluminum products, the company also offers improved Bonderite technologies for the three key steps of degreasing, etching and hot or cold sealing in the aluminum anodising process.

Aluminum, in its raw, unfinished state, reacts with oxygen in ambient air and other weathering influences, resulting in an uncontrolled and undesirable, unaesthetic oxide layer. Although galvanic coating can be used to prevent this effect, it adds an extra layer of material and weight. In contrast, anodising directly converts the outermost aluminum layer into a controlled thin and smooth oxide skin, reliably protecting the surface from further oxidation (corrosion). Depending on the specific needs of the end product, the typical thickness of the anodised layer is normally just between five and 25 µm.

"As the demand for lightweight and aesthetic aluminum parts increases, manufacturers need cost-effective anodising solutions to maximise both the productivity and sustainability of their processes," says Raul Hernandez, business development manager Light Metal Finishing for Henkel. "Our Bonderite portfolio for aluminum anodising comprises specialised products for all process steps, beginning with chemicals for mechanical pretreatment, for example grinding, polishing and cleaning, up to the substances for the chemical process, i.e. degreasing, etching, desmutting, brightening, anodising, electrolytical colouring and sealing.

"The range is actually fronted by a new non-etching one-component degreaser, a long-life etching additive for outstanding E6 finish, and a high-productivity hot sealing as well as a nickel-free cold sealing additive."

The first step in anodising is always dedicated to degreasing the surface. For brightened or high-gloss aesthetic parts that can't be etched for anodising, Henkel has developed Bonderite C AK 62115. The one-component degreaser simplifies product handling vs. conventional



two-component alternatives and is also highly reliable in removing residual brushing paste from the part surface.

As a key player in the market of long-life etching additives, Henkel is well-known for its family of Bonderite C AK products combining low chemical consumption with optimized E6 results. E6 refers to a more thorough etching process compared to E0 and is frequently used to eliminate larger surface defects by actually removing part of the material. One of the company's most recent product solutions in this field is Bonderite C AK 62250, which has been custom-tailored to combine the required high etching and finishing levels with excellent bath stability, including reduced drag-out and no foaming. This also makes it an economic compromise between caustic soda and other long-life etching products.

The final step in the aluminum anodising process is sealing. Two highlights in Henkel's dedicated product offering provide breakthrough solutions addressing demands for increased performance in hot sealing and minimised toxicity in cold sealing.

Bonderite M ED 11011 is Henkel's latest hot sealing additive, developed to at least double the standard life span of sealed parts and increase the productivity of single-step hot sealing by a minimum of 20 percent. Hot sealing with this new product takes exactly 3 min/µm, fixed, as a standard sealing time. By reducing the make-up of the bath by

50 percent or more, the innovative solution also results in a smaller CO<sub>2</sub> footprint. Altogether, processors using Bonderite M ED 11011 can benefit from substantial cost savings per square metre of hot sealed material.

With Bonderite M ED 11150/11151, Henkel is also underscoring its leading role in cold sealing solutions for anodised aluminum. Although it can involve several steps, cold sealing is a very attractive high-productivity alternative to hot sealing, but has traditionally been associated with nickel and subsequent toxicity issues. Henkel's new game-changing cold sealing additives are completely nickel-free, without compromising process time or sealing quality, and also QUALANOD approved.

"Only a few suppliers can match the advanced technology behind these new Henkel products for aluminum anodising and we are firmly committed to answer the needs of aluminum processors with a cascade of further innovative solutions designed to create more value for our customers, manufacturers, consumers and the environment," adds Raul Hernandez.

Bonderite is a registered trademark of Henkel and/or its affiliates in Germany and elsewhere.

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## Altus adds vertical drying solutions to its portfolio

To maintain the reliability of sensitive electronic sub-assemblies, it is important for the printed circuit board to be coated. This involves a special drying process which ensures the PCB is protected and can withstand any difficult conditions. Altus Group, a leading distributor of capital equipment, understands the importance of this process and offers the very best drying systems in the marketplace, including those from Rehm Thermal Systems.

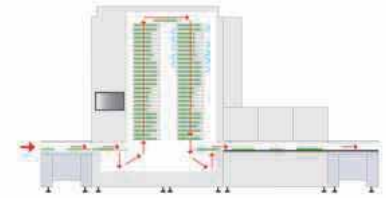
Rehm Thermal Systems provides innovative drying and hardening procedures to help protect electronics from damage due to corrosion or other environmental influences such as moisture, chemicals and dust. The coating and drying process increases the lifetime and quality of the product.

"It is extremely important to ensure electronic assemblies are coated so they work as they should. This is apparent in all sectors, and especially in automotive which has to withstand harsh conditions," says Tony Sweetman, Altus sales manager. "At

Altus we understand how important this process is and that is why we only have the very best systems in our portfolio. This includes equipment from Rehm for example, Alteco, the company's innovative vertical drying system. Uniquely, it offers maximum performance within a minimal footprint. All industries that utilise coating processes and work with sensitive flat assemblies with protective coating benefit from this system. We have seen a great interest in the Alteco vertical dryer since its recent introduction and foresee this to continue in 2020," he concludes.

Alteco, features the exceptional temperature profiling possibilities and low energy consumption. With its vertical transport, the Alteco replaces a comparable 40-metre-long horizontal dryer with a system length of just 4 metres. This means valuable space is made in the production facility, and existing resources can be optimally used, with daily production enhanced.

Alteco allows flexible, high-performance



drying and hardening processes of all protective paints and casting compounds that can be hardened with convection heat. The system consists of two process towers, which are each divided into four heating zones, and a downstream, segmented cooling tract. The circuit boards are loaded into goods carriers at the furnace infeed. These run through the drying process in the system in a vertical direction and are stacked on top of each other during the hardening process.

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## Sustainable mass finishing operations from Walther Trowal

In September, Walther Trowal commissioned a new facility for placing wear linings into new and used work bowls, which are essential components of the company's mass finishing machinery. With this significant step Walther Trowal practically doubled its capacity for overhauling the work bowls and thus guarantees fast turnaround times and high equipment availability for its customers.

Central function of any mass finishing operation is the removal of a small amount of material from the workpieces being processed. However, the downside of this process is that the inside of the work bowl, in which the mix of media and work pieces is moving, is also exposed to a certain amount of wear, especially in case of aggressive grinding operations.

That's why, for many years, Walther Trowal has been offering a service for the complete refurbishment of worn work bowls. The service not only includes the placement of new wear linings into the work bowls but also a complete inspection of all



equipment components and, if necessary, repair welding of the steel fabrications as well as the replacement of worn items with original spare parts. This way the customers can be absolutely sure that after the refurbishment work their mass finishing system is running again as if it was brand new.

The new facility at the company location in Haan was equipped with additional curing ovens allowing the relining of more than 15 work bowls per week. With the installation of a new digital manufacturing control

system pass-through times could be significantly reduced resulting in much faster deliveries. Of course, the fact that all casting moulds for the various machine types and sizes are in stock and, therefore, immediately available, also helps expediting turnaround times.

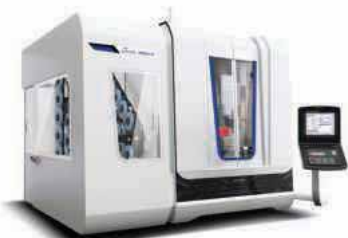
Whenever Walther Trowal receives a work bowl for refurbishment, the job is not just limited to relines: Actually, the customer receives a work bowl that is as good as new with not only a new wear lining but also new equipment components.

Once a work bowl refurbished by Walther Trowal has been delivered to the customer, the respective mass finishing machine will be up and running again within one or two working days.

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