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NEXT ISSUE - APRIL 2018

- MACH 2018 Preview
 - Medical Report
- Component Cleaning
 - Deburring
- Surface Measurement
- Tool & Profile Grinding

Digital Solutions at STUDER, SCHAUDT, MIKROSA

Is Industry 4.0 just a vision? Not with the UNITED GRINDING Group. The objectives of the "smart factory" are the elimination of unplanned machine downtime and the optimal use of resources. STUDER, SCHAUDT and MIKROSA tackle the issue together with the United Grinding Group AG (UGG). Specifically, it's about three products: Production Monitor; Remote service; Service Monitor.

Production Monitor



The Production Monitor is a reliable 24/7 monitoring service. The customer has always and everywhere the overview of his machine park. Running times, non-productive times and disruption times are available in real time.

This data allows you to optimize production in terms of utilisation and availability, thus supporting the production managers, planners and production staff. Today, a suitable tool is often missing to visualise the utilisation of the machine. This practical tool can be displayed on different interfaces, for example on an app or on a web browser. Another advantage is that on the Production Monitor the customer can configure the machine park based on his needs. Everything is possible, from detailed information of an individual machine to the complete overview of the entire plant.

Remote service



Fast support is essential for customers. That's why UGG offers the "Remote Service". This also enables a fast and qualified service during operation of the machine. At the push of a button, a ticket is

opened and sent in a few steps to STUDER, SCHAUDT or MIKROSA. The completion of the ticket helps to limit the criteria and therefore helps give the service specialists a fast overview of the service case. It goes without saying that all tickets and service cases are documented in a logbook. Direct access to the machine is only possible if explicitly permitted by the customer. If this connection is established, the Conference Centre can communicate, exchange data or directly interface with the machine control. With the Remote Service you get fast, structured and uncomplicated support.

Service Monitor



Until recently, it was a time-consuming procedure for the customers of STUDER, SCHAUDT and MIKROSA to consult the operating instructions for the necessary maintenance measures. Today, this is done

conveniently via the service monitor. This tool displays in a simple diagram the maintenance due date of all connected machines. But that's not all; the operators of STUDER, SCHAUDT and MIKROSA machines receive detailed information about the tools and spare parts needed, including the instructions for each maintenance measure, the customer receives a structured maintenance planning and this over his entire machine park. Maintenance can thus be planned and carried out on a plant-wide basis.

Full story in the April issue

Fritz Studer AG Tel: 0141 33439 1279 Email: info@studer.com www.studer.com GrindTec - Hall 7 Stand 7033

Bigger and better than ever



The world's leading trade fair for grinding technology will present innovations for the first time in nine exhibition halls. GrindTec organiser AFAG is guite used to the regular growth of the grinding technology fair. For GrindTec 2018, another hall Hall 9/Pavilion had been planned from the very beginning, but this was completely quickly occupied. For this reason, the project management decided to expand the capacities again at short notice and to add a second additional Hall 8. With nine exhibition halls and 44,000 m² of exhibition space, the upcoming GrindTec will be the largest to date. The number of participating companies will also continue to grow, with AFAG currently expecting around 600 exhibitors - a substantial increase from 577 two years ago.

New trade fair hall completely rented

Just as in the cases of Halls 1, 2, 3 and 6, the new pavilion, which is a first-class temporary trade fair hall, is completely occupied. Only rather small isolated areas are still available and these are running out. Interested companies should get in touch with the trade fair product management (see below) as soon as possible. The registration forms can also be downloaded from GrindTec's website: **www.grindtec.de**

Leading fair for grinding technology increasingly on the radar of Asian firms The level of internationality is likewise as high as in 2016, with some 40 percent of the exhibitors coming from 26 countries other than Germany. In particular, Asian suppliers of grinding technology have become increasingly interested in GrindTec. More and more companies from China, Korea, Japan, Taiwan and India regard the GrindTec trade fair as the perfect platform for presenting their products. Indeed, three out of every ten international exhibitors now come from these Asian countries.

The leading suppliers of grinding technology registered their participation in GrindTec 2018 a long time ago, and some have greatly expanded their exhibition space. GrindTec is the most important trade fair for many of them and here they will achieve top results, as most recently at GrindTec 2016, when some 64 percent of the exhibitors rated their participation as "very good" or "good" and another 28 percent said it was entirely satisfactory.

Grinding Technology 4.0 theme park at GrindTec

The AFAG trade fair company, together with the "mav" professional journal published by the Konradin Media group and







the FDPW Association of German Tool Grinders, is organising the theme park "Schleiftechnik 4.0" (Grinding Technology 4.0) for the second time. Leading manufacturers of controls, machines and robots have committed themselves to participate and will be presenting their visions, ideas and solutions in the form of lectures at the Forum. The focus will be on networked systems which exchange data in real time, analyse it and then control themselves. Such solutions make it possible to design grinding processes so that they are much more efficient and cost-effective. This theme park is being organised to present the advantages of digitalisation in concentrated form.

GrindTec 2018 takes place at the Messe Augsburg from 14th to 17th March.

For further Information, contact: AFAG Messen und Ausstellungen GmbH Tel: 0049 821 58982 143 Email: winfried.forster@afag.de www.grindtec.de



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New machine developments from Walter and Ewag at GrindTec

Walter and Ewag will both be unveiling new machines at this year's GrindTec, although these developments will be kept under wraps until the show opens, says Walter Ewag UK.

In addition however, both companies' displays as part of the United Grinding stand will reinforce their world leading position in tool and insert grinding.

Walter will be showing the two-in-one rotary eroding and grinding Helitronic Vision Diamond 400L with the recently announced Robot Loader 25; the manual Heliset Plus tool measurement machine and a Helicheck Pro machine, for fully automated tool measurement with robot loader.

The Robot Loader 25, brings a new level of automation to the Helitronic Vision Diamond 400L, permitting enhanced levels of unattended production. The loader can accommodate 21 tools of up to 315 mm diameter and weighing 20 kgs or 28 tools of up to 220 mm diameter and 70 tools up to 105 mm diameter.

Equipped with a Fanuc robot and featuring new software that accommodates the 'random' loading and storage of tools and blanks in HSK holders on up to seven pallets, the efficiency and effectiveness of the Robot Loader 25 is enhanced by laser marking for tool setup and optional 'diameter determination' functionality for automatic operation.

Launched last year, the Heliset Plus promises to help optimise the erosion machining times of complex tools by up to 30 percent by being integrated into the tool production process.



The two-in-one rotary eroding and grinding Helitronic Vision Diamond 400L with Robot Loader 25

Data output via XML to the Walter Window Mode software in the Walter Helitronic Power Diamond or Diamond Evolution erosion machines, or the Walter Helicheck measuring machines, also saves valuable working time.

Heliset Plus replaces stand-alone tool measurement operations previously carried out remotely in the tool preparation area or in the erosion machine, directed by an intuitive user interface and touch screen operation.

Tools up to 350 mm diameter and 400 mm long can be measured.

The Ewag display will include the 6-axis Compact Line machine, the Laser Line Precision for laser machining of diamond tools and the Laser Line Ultra for the laser machining of all cutting materials, including CBN, ceramic, PCD and CVD.

The 6-axis Ewag Compact Line is a high-precision, compact and flexible machine for the grinding, including peripheral grinding, of inserts in tungsten carbide, cermet, ceramic, PCBN and PCD.

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

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 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.



The 6-axis Ewag Compact Line is a high-precision machine for the grinding of inserts in tungsten carbide, cermet, ceramic, PCBN and PCD including peripheral grinding

Walter Maschinenbau GmbH produces CNC machines for grinding and/or eroding metal, wood and PCD tools and rotationallysymmetrical 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.

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

Walter Maschinenbau GmbH is a world leading manufacturer of tool grinding machines and optical CNC measuring machines, while sister company Ewag AG is a leading manufacturer of high-precision tool grinding machines. Ewag machines are used worldwide in the watch, dental, electrical, automotive and aviation industries, as well as in the manufacture of precision micro-components.

Walter Ewag UK Ltd Tel: 01926 485047 Email: neil.whittingham@walter-machines.de www.walter-machines.com

Hall 7 Stand 7033

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Master Abrasives to exhibit in Augsburg

Midlands-based Master Abrasives will be exhibiting the full range of Master® products at GrindTec. Master products being exhibited include the precision product range of grinding wheels and dressing products as well as mounted points and carbide burrs.

Master Abrasives recently relaunched the Master brand of products to include a full range of high-quality abrasive products used in manufacturing industries such as aerospace and automotive. Introducing its own brand of convolute wheels, unitised products and quick-change discs has provided industry with a cost-effective solution to grinding and finishing applications. This range will be exhibited at GrindTec and technical representatives will be available to discuss how these products can improve productivity in various applications.

Paul Batson, managing director of Master Abrasives, comments: "At the GrindTec show in 2016, we displayed a few of our products from the Master brand and were able to find new distributors in a number of countries. This time, we will be exhibiting the full range with our updated, modernised brochures available for visitors to take away. With attendees from 60 different countries, I'm confident that we will come across even more opportunities this year to make the Master brand internationally known."

In addition to new products, Master Abrasives still offers a full range of grinding wheel specifications and dressing tools for a variety of applications. A new economical range of wheels in storage cases which come complete with changeable plastic bushes has recently been made available





The Master sales team met representative for Poland Slawomir in November during his visit for training on newly introduced Master products

from stock. Grinding wheels will be a focus on the Master stand at GrindTec where visitors can see the array of grades available.

Master mounted points were introduced to industry over 50 years ago, but a new addition is the Master mounted point kit which consists of 12 pink Aluminium Oxide mounted points on 6 mm shanks. Alongside this is the range of newly introduced carbide burr kits, one 5-piece on 6 mm shanks and one 10-piece on 3 mm shanks, both in double cut. Master Abrasives will be looking out for potential distributors for its complete Master range at GrindTec this year.

Master Abrasives' recently appointed agent in Poland, Slawomir Klisiewicz will also be joining the team at GrindTec in 2018. Slawomir was appointed as technical sales representative to promote the Master brand of abrasives as part of the company's sales drive into export markets. He will be on hand to support the Master stand and discuss applications with any visitors from 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 products in the Master brand which is now recognised internationally for high-quality and look forward to working with new potential distributors on helping customers to improve productivity in other parts of the world following the GrindTec show."

Master Abrasives is the sole UK and Eire agent for the Meister Abrasives Corporation, an international manufacturer of high precision industrial abrasive products, with its headquarters in Andelfingen, Switzerland.

The Daventry-based independently owned company has built an enviable reputation for quality and service that is as strong today as it has always been. The well-known trademark of 'Master' remains on much of the product range and services offered by the company in the UK.

The tool services department at Master offers repair of all pneumatic and electric tools and services such as airline efficiency and noise assessments. It also provides solutions to Hand Arm Vibration with tool testing in accordance with ISO 5349-2, trigger time monitors or HAV management systems, and toolbox talks for the awareness of HAV requirements.

Master Abrasives

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Hall 5 Stand 5060

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If you would like to find out more about the processing of gear parts and gears, please call Chris Boraston: +44 (0) 2476 22 66 11

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Advanced Grinding Solutions at GrindTec

Coventry-based Advanced Grinding Solutions will be very busy at this year's Grindtec exhibition with no less than eight of their principal machine suppliers all exhibiting; Gerber (deburring machines) Hall 1 Stand 1017, Krebs & Riedel (grinding wheels) Hall 1 Stand 1035, Nova (internal/external grinders) Hall 3 Stand 3111, Bahmuller (internal/external grinders) and Tschudin (centreless grinders) are both on Stand 7058 in Hall 7, FLP (lapping machines) are in Hall 4 Stand 4069, Platit (coating machines) are in Hall 3 Stand 3050 and finally the new addition to the line-up at AGS, Rollomatic (tool grinding machines) are in Hall 5 Stand 5098.

Tschudin is exhibiting its latest machine, the Proline Centreless Grinder, that eliminates almost all of the mechanical procedures for setup and grinding, especially the adjustment of the work rest blade height. As a world's first in centreless grinding, and covered by a patent, the regulating wheel on the new Tschudin machine is automatically adjusted in height by an independent CNC axis (Y-axis). In order to achieve the best possible roundness, the optimum height of the workpiece is done simply by digitally adjusting the height position of the regulating wheel. During the production process, the Y-axis will also compensate automatically for any change of grinding geometry due to wear of both the grinding and the regulating wheels. The quality produced therefore remains consistent.

Krebs & Riedel is introducing new types of grinding wheels with improved grain structures and novel bonding systems that enhance grinding wheel quality and optimise performance. Special wheels for gear and thread grinding will also be exhibited along with the Diamond and CBN wheels that have been manufactured by Krebs & Riedel for more than 20 years and are available from 3 mm to over 900 mm in diameter with peripheral grinding speeds of up to 160 m/s.



Bahmuller is presenting the latest machine designs of its fast production grinders for the mass production of automotive parts such as turbo charger wheels and shafts and various fuel injection components. Bahmuller has supplied numerous machines to Delphi Diesel Systems here in the UK and has recently been highly successful in providing machines with full automation to the turbocharger industry with AGS having eight machines currently under order.

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

Rollomatic, the Swiss manufacturer of very high precision grinding machines for the cutting tool and punch industries, has chosen Grindtec to launch new machine types and will also feature new software and focus on robotics and the laser machining of PCD tools.

Staff from Advanced Grinding Solutions will be present throughout the exhibition to





meet up with UK engineers. To arrange a suitable time or for further information, contact:

Advanced Grinding Solutions Ltd Tel: 024 76 226611 Email: sales@advancedgrindingsolutions.co.uk www.advancedgrindingsolutions.co.uk



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A new standard in modern technology and flexibility

Launched at the DeburringExpo in Karlsruhe in October, the latest and smallest model in the well proven Peter Wolters AC microLine portfolio, the AC 400 sets new benchmarks in modern technology and flexibility. This newly designed system is based on decades of experience and ideal for high precision parts of small and medium sized batches. The AC 400 captivates through its compact design with maximum performance and stability, due to the innovative cast iron main machine base. The modular design allows the AC 400 to be used for fine grinding, lapping, polishing and deburring. In order to cover a broad range of workpieces, the machine can be delivered with different epicylic workpiece drives, drive power and rotational speeds. As usual all process relevant parameters are controlled and visualised through a Siemens touch panel. All calculated data can be stored within a program memory.

As on all other models, the AC 400 can be equipped with RangeCare® maintenance.



Some important features include:

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- In-Process force control through
- integrated pressure load cell
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Double-sided fine grinding, honing, lapping, polishing and deburring The successful AC microLine® product line, with its applications in fine grinding, honing, lapping, polishing and deburring, ensures optimum machine configuration for double-sided processing of flat and high-precision workpieces. With an AC machine the workpieces are transported in workpiece carriers, enabling them to be batch machined. The planetary kinematics of working wheel, pin ring and workpiece carrier rotation enables consistently high quality regarding dimensional accuracy, flatness, parallelism and surface finish. This kind of relative movement between tool and work piece leads to

a uniform abrasive layer as well as extremely flat material removal. Due to the flexibility of the technique, a wide variety of different materials and geometries of plane-parallel workpieces can be machined.

The Peter Wolters AC microLine machines are equipped with cooling to the working wheel for removal of the heat generated through grinding in the machine system. A specially developed cooling labyrinth, with a flow of coolant circulating at high volume, significantly reduces the temperature difference between working wheel carrier and grinding wheel. This leads to balanced and reproducible grinding wheel geometry, providing a stable process with constant high-precision machining results.

The Peter Wolters AC microLine product line includes different machine sizes, which are representative of the working wheel diameter: AC 400, AC 535, AC 700, AC 1000, AC 1200, AC 1500 and the AC 2000, which can process double-sided workpieces up to a diameter of ca. 550 mm.

Lapmaster Wolters is a specialist in lapping machines and lapping machine systems, polishing machines and polishing machine systems, fine grinding machines and fine grinding machine systems, bore honing machines and bore honing machine systems.

In today's technologically advanced world, there are a growing number of applications where conventional machining techniques just aren't accurate enough to meet precision surfacing requirements. Precision surfacing with abrasive media, a technology developed and refined by Lapmaster Wolters over the past 50 years, can often be the answer.



However, it takes more than the technology alone to produce precision surfacing specifications. It takes a company with extensive knowledge and experience with a broad range of materials and applications, a company capable of creating customised, turnkey precision surfacing solutions utilising the latest conventional and superabrasive techniques. In short, it takes Lapmaster-Wolters, the ideal partner for all your precision surface technology needs.

Since 1948, industry has relied on Lapmaster Wolters to solve the most challenging precision surfacing problems. With over 50 years of experience, the company has a proven history of successfully developing cost effective processing solutions for virtually any application.

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Lapmaster Wolters Hall 5 Stand 5108

UK Contact: Lapmaster Wolters Ltd Tel: 01752 893191 Email: sales@lapmaster.co.uk www.lapmaster.co.uk



Swiss Precision Gear Grinding

Cars, aircraft and industrial machinery all require high-accuracy gears for their transmissions. Worldwide, Reishauer gear grinding machines play a major role in the manufacturing process of grinding gears used in such transmissions. Demands placed on these transmissions include the reliable transfer of high torque and power density, low weight and minimal noise emissions. Reishauer precision ground gears ensure the demands placed on transmission gears are fully met.



REISHAUER

Gear Grinding Technology

Boost productivity in the production of superhard tools

The new Agathon Neo laser pre-processing machine expands the option for the processing of superhard materials. Dramatic increases in the productivity of machining indexable inserts from superhard materials are achieved.

The increasing demand for mobility, lightweight construction and materials technology are driving the need for superhard cutting materials. Polycrystalline diamond (PCD), polycrystalline cubic boron nitride (PCBN) and ceramics are widely used, and the market is continuing to grow. The current processes of manufacturing PCD inserts consists of standard known process chains and machines. However, this method of PCD processing is costly, time consuming and labour intensive. The conventional method of finishing (grinding, ultrashort pulse laser) can greatly benefit from a pre-processing preparation step. This is where the Agathon Neo laser processing machine comes in.

New pre-processing with 100-fold material removal

The new Agathon Neo laser processing machine extends the process chain for PCD processing. The preparation of PCD with the Neo laser takes place with a 100-fold higher material removal rate compared to grinding. The PCD is down to a few hundredths of a millimetre away to the final contour of the scope and clearance angle zoom. The





finishing is done afterwards as usual, often on a grinding machine. The productivity of the existing process chain is reinforced by adding a simple laser processing-procedure with unprecedented high material removal rate and minimises waste.

The world premiere of Agathon Neo laser processing machine was in September 2017 at the EMO in Hannover, Germany. The novel approach is not based on finishing, but on pre-processing a product close to the final contour. This near-to-net-shape process utilises the potential of the high stock removal and therefore has aroused much interest. Innovative companies recognise the opportunity, with a small extension of their machinery to eliminate current bottlenecks and to multiply the productivity of their existing production.

Agathon shows the widespread V plate as an example application

While with pure abrasive finishing, a side plate type takes about 15 minutes, this time can be reduced to one minute with laser pre-processing on Neo, plus five minutes grinding and finishing.

The introduction of the Neo laser processing machine provides the advantage of stable, industry-standard technology, without relinquishing the proven and effective manufacturing process in place. The easy-to-use and programmable device fits seamlessly into today's production. The user-centric, space-saving design already contains all the necessary components for operation and just requires a power source and internet access. The extraction and a sophisticated thermal management system for stable production are already integrated directly into the machine.

Neo is expanding Agathon's new product range. The industrial-grade 4.0 system



provides all relevant machine and production data utilising Agathon smart connectivity solutions. The Neo operates hand in hand with the modern Agathon grinding machinery for the industrial processing of inserts. Agathon is known for its high-quality products and after sale support, including application engineers, teleservice technicians and onsite service support.

Agathon continues to advance in the grinding process as well. With specific regards to machining superhard materials a grinding process with adaptive infeed is now available, which runs on the unique 2D process force measurement. In addition, the HSK E25 clamping system allows an autonomous handling of the ball nose end mills. Complementing the above features is a programmable 3D probe which, for example, can locate the braced PCD tips.

Agathon AG, founded in 1918, is a world-leading manufacturer of high-tech indexable insert grinding machines, as well as standard parts and guide elements for machine tool and mould making. It also recently introduced a laser product line.

With its research and production facilities at its Swiss headquarters in Bellach near Soloturn, Agathon employs around 220 people worldwide. Excellent customer service and a large network of agents guarantee customers worldwide technical support, training and consulting for holistic business solutions.

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The perfect symbiosis

by Walter Graf, marketing manager of Reishauer GmbH

Modern thinking does not view machine tools and tooling as separate entities. Swiss company Reishauer has shaped industrial history since its foundation in 1788. Originally, the company was set up as a smithy to make hand tools. In 1863, a "taps-lathe" was built to make the first threading taps with a radial relieving unit. With the growth of the tap market share, the company was well positioned to develop its first tap grinding machine in 1928.

This thread-grinding machine required precision gears for setting the pitch of the different threads on taps as the precision of the threads was directly related to the accuracy of the gears within the machine. It was the dissatisfaction with the status quo of technology that drove Reishauer engineers to find a better way to manufacture high precision gears. This led them to the invention of a new idea of gear grinding: the continuous generating process of grinding gear profiles, a process for which Reishauer still holds the leading edge today. This process delivered gears that were more accurate, cheaper, and faster to manufacture than by the previous methods.

In 1945, the first continuous-generating gear grinding machines entered the market. The success of the thread and gear-grinding machines prompted Reishauer to halt tool manufacture and to concentrate exclusively on building machine tools. In 2006, the company decided to concentrate fully on gear-grinding machines.

In 1998, a familiar pattern of dissatisfaction with the status quo repeated itself, but in reverse order. The available tools for the gear-grinding machines, diamond dressing tools and grinding wheels, could no longer match the performance and accuracy potential of the continuous generating process. For this



Robot wheel loading of a kiln cart



reason, Reishauer began its production of diamond dressing tools and laid the foundation of its performance portfolio that included machine tools and tooling.

In 2008, Reishauer founded a grinding wheel factory, shortly followed in 2012 by a factory for workholding. These steps ensured the full potential of the machine tools to deliver consistent quality at low costs per gear ground. Furthermore, this put Reishauer into a position of being able to control all factors that influence the quality of the continuous generating grinding process. The mindset to view tooling and machine tools separately no longer corresponded to modern thinking.

Grinding wheels

As the Greek philosopher, Aristotle, stated: "Every tool achieves perfection by serving one, instead of many purposes." The company strictly adheres to this advice and limits itself to the manufacture of tooling that serves only one purpose: to grind high precision gears on Reishauer machines. The grinding wheels must grind workpieces to the required geometry, surface finish and surface structure, within a short cycle time and without thermal damage. To meet these requirements, Reishauer has built one of the most modern and most automated grinding wheel factories in the world. In contrast to other wheel makers, Reishauer had the advantage to deal with only a few wheel dimensions and only one field of application, which made possible a high degree of automation. The extensive use of robotics ensures uncompromising

homogeneity of the finished products from

lot size to lot size.

Diamond dressing tools in symbiosis with the grinding wheel and the machine tool Before a grinding wheel can deliver the required accuracy and material removal rate, it requires dressing by a high-precision rotary diamond dressing tool. The dressing of the threaded grinding wheel for continuous generation, grinding meets several requirements: Firstly, dressing imparts a perfect worm profile and makes the threaded wheel free cutting. Secondly, dressing removes any impurities or wear that the grinding process may cause to ensure that the wheel's pores stay open to accommodate grinding oil and can remove the chips that the high material removal rates generate.

Made in Switzerland

The high degree of in-house manufacturing or vertical integration is the foundation of the Reishauer performance portfolio. Reishauer develops and manufactures and all machine core components and all tools in-house in Switzerland. In this way, the continuous generating process maintains its leading edge as the superior hard-finishing method for making gears.

Reishauer AG

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See us at GrindTec, Augsburg/Germany March 14 - 17, 2018







UNLEASHING A NEW WORLD OF POSSIBILITIES

ANCA CNC MACHINES IS FIRST TO MARKET YET AGAIN WITH THE FCP4 PRODUCTION GRINDER TO BE LAUNCHED AT GRINTEC 2018. Rather than manufacturing a drill on two or three separate machines, the FCP4 can produce a complete drill on a single machine. Designed for drills up to 4mm, the multi spindle machine offers a brand new grinding solution to the high speed drill market.

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Comprehensive grinding solutions on offer from Hardinge Grinding Group

Kellenberger, the Swiss manufacturer of high precision grinding machines, is representing the interests of the international Hardinge Grinding Group with a comprehensive offering at Grindtec.

Featured on the stand will be four machines from Group companies: the newly introduced Kellenberger 100 concept that can be tailored to meet specific customer requirements; the highly popular Kellenberger VARIA 1000 universal cylindrical machine; the latest Hauser 2000 jig grinder with its new frame design; a Hardinge Super-Precision Quest GT 27 which offers turning and grinding in a single setup.

The latest Kellenberger 100 series platform sees the high-performance, economical grinder segment in the Group's portfolio being completely overhauled to meet a range of future manufacturing demands. Based on a modular design, it incorporates key elements of Kellenberger's Vista and Vita model ranges, the Jones & Shipman Ultramat CNC and Ultragrind 1000 and the Tschudin T25, aspects of which have been integrated into the new range.

Kellenberger has developed a platform on which diverse machine concepts can be realised in line with customer budgets and performance expectations. In effect, it offers the most diverse range of configurations to achieve the widest range of grinding operations at a highly competitive price.



The new design Hauser H 2000 jig grinder



The latest Kellenberger 100 concept grinding machine

The new Kellenberger 100 platform far exceeds the capabilities of many existing grinding machines. Due to its modular configuration, assembly of 100 series machines is simplified making it possible to optimise manufacturing costs for the machine and ensure an excellent price/performance ratio for the purchaser. Numerous 'standard' options can put the customer's finishing touches on each individual machine.

The user-friendly and ergonomic design of the Kellenberger 100 machines also features a new, simple operator guidance system with an intuitive touchscreen panel. The machines are equipped with the latest Fanuc 31i CNC controls with 19" touchscreen and a newly designed cycle programming or workpiece-related graphic programming is an option.

The machine featured at Grindtec will be the 1,000 mm between centres variant, the other option being 600 mm. It will be equipped with a WeFlex automated load / unload system supplied by Wenger AG. This is an option that can be fitted to any Kellenberger 100 derivative.

With more than 1,000 Kel VARIA machines in use worldwide, the VARIA universal cylindrical grinding machine range epitomises the best in working and surface quality among Kellenberger's range of products. It has consistently been upgraded throughout its 20 year life, but now, with its larger work space, distinctly longer machine table and distance between centres of 1,600 mm, it is equipped for a very wide range of machining possibilities.

Aimed at the demanding environments involved in high-precision production of prototypes and small and medium-size components, typical areas of use include machine construction, the production of tools and moulds, the fabrication of precision components for the automotive, electronics and aircraft industries and subcontractors with their wide variety of needs.

The VARIA is available with distances between centers of either 1,000 or 1,600 mm and heights of centres of either 200/250 or 300 mm as required. More than 30 wheelhead variations with external and internal grinding spindles permit an array of machining possibilities and the right application-specific configuration at all times.

The Hauser 2000 jig grinder is the new successor to the well-positioned H35-400 model, which set industry benchmarks in terms of precision and performance for jig grinders.

The 2000 is a universal jig grinder with proven technical features such as automatic taper grinding, automatic grinding tool changer (ATC) and automatic pallet changer (APC). It not only meets the demand of the market for combined grinding and hard milling on a single jig grinder but also enables further improvements in machining precision to meet future requirements.

The main technical feature is the

GrindTec Preview

dual-frame design, which significantly increases the rigidity of the grinder and therefore ensures even higher precision. In this box-type design, the machining head is positioned centrally within the machine frame, thus enabling machining forces to be optimally controlled.

Almost no transverse forces are created and as the tool machining point is located at the centre of the machine, practically all thermal expansion effects are eliminated.

With higher dynamic axis movements and significantly greater rigidity, the Hauser 2000 gives the best possible conditions for finishing with hard precision milling.

Finally, the Hardinge Quest GT 27 SP creates a combination of `state-of-the-art` manufacturing, such as turning and grinding in one setup, with an automatic loading and unloading system offering great potential to significantly reduced production costs.

With the Quest GT 27 SP CNC Turning and Grinding Centre, equipped with an optional integrated parts handling system, Hardinge offers an outstanding technical and economic solution.

The Quest GT 27 SP is a combined high-accuracy turning & grinding centre, specially designed for the high precision manufacturing of complex components in a single setup. This machine features a 10 hp, 8,000 rpm main spindle with 27 mm bar capacity, upgradeable to 42 mm if required.

As a new option, the machine can now be equipped with an automatic flexible loading and unloading system. This features twin belt conveyors with a compact and space saving 6-axis robot cell mounted above the machine. It has a workpiece specific three jaw double gripper system for workpiece handling.

The Hardinge Quest GT 27 SP TURN/GRIND is ideally suited for stand-alone hard turning, hard turning and grinding or simply grinding operations to produce complex and high precision components.

Surface finishes (turning) of 0.2 μ m and exacting part roundness of < 0.4 μ m can be achieved. A total variation on component



This version is fitted with a 6 axis robot load/unload system

diameter of $< 3 \mu m$ provides outstanding machining results equivalent to grinding.

Jones & Shipman Hardinge Ltd Tel: 0116 201 3000 Email: info@jonesshipman.com www.jonesshipman.com

Hall 5 Stand 5129

Creating Tool Performance

A member of the UNITED GRINDING Group

SYSTEM AND SOLUTION PROVIDER FOR TOOL MACHINING

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Manufacturing and resharpening of rotary tools – HSS, CBN or super-hard materials – grinding, EDM, laser or measuring, as well as insert production, WALTER and EWAG offer all technologies from a single source! Together with software and services we provide the best fit for your requirements – you can feel secure with the competence and precision of the experienced partner!





Creating Tool Performance

A world premiere, surrounded by many innovations

Rollomatic is set to take GrindTec by storm with a world premiere, as well as other new and unique grinding machine technology. The company is underlining its position as an innovation driver with innovations that mark a further stage in the development of grinding technology.

"We want to maintain the suspense for as long as possible," admits Damien Wunderlin, head of marketing and sales at Rollomatic SA. "For this reason, we are not going to reveal the feature list of our completely new designed grinding machine until GrindTec. We are proud to offer a machine that is full of innovations and new technologies, and that will give our customers a real competitive edge as well as add a further highlight to our portfolio."

Interconnectivity taken one step further

With the pace of technology, we constantly have more of our lives on our smartphones or tablets. Any service that can help take our business to the next level in terms of mobility is a great asset. This requirement has become a reality thanks to Rollomatic's Industry 4.0 solutions. RMonitor is an intelligent piece of monitoring software that checks the efficiency of any production tools being used. The system visualises the current status and historical performance of machinery and reports any upcoming preventative maintenance, for example. "In the latest development stage, all data can actually be called up from a mobile device such as a smartphone or tablet", reports Damien Wunderlin. The RConnect software links to an ERP system, e.g. via OPC, and offers the opportunity to analyse production statistics and plan processes.

A new offshoot from the ShapeSmart family

High-precision tools are impossible to produce without perfectly concentric blanks. "Anyone who has to meet tolerances in the very lowest µm range has to take extreme care when preparing the blanks. We already developed the ShapeSmart[®] family for these types of applications many years ago. With three to five axes and simultaneous rough and finish grinding, the cylindrical grinding machines cover the usual requirements placed on this type of machine and offer even more in precision grinding." says Damien Wunderlin.



More autonomy for greater efficiency

Long before the first self-driving cars are on highways and residential streets, industrial production is already re-defining the term "autonomy". Here, industrial autonomy means 24/7 production, with as little intervention as possible from the operator and continuous high quality, thus highlighting the key factors in efficient production. "We have already embarked on this path with the latest 6-axis tool grinding machine from the GrindSmart®XW family. Thanks to an expanded, ultra-compact grinding wheel changer for 16 wheels with a coolant distributor, we can increase capacities almost threefold," says Damien Wunderlin. This simplifies process management for the user and the non-productive times are shortened as well even around the clock if necessary.

Particularly in tool grinding processes that are very sensitive to precision, measurements may need to be done at certain times. 3D probing of the tool geometry has been integrated into the grinding machines from Rollomatic for many years now. Even more efficient are the new contactless measuring solutions in-process which will also be presented at GrindTec. "No operator intervention is required in order to measure the tools in the µm range. For example, diameters or the index position of every tooth is read out via laser and this guarantees the autonomy of the production process and its quality despite the micro size required. In this way, even very small tools can be measured without damaging the cutting edge. In addition, the measuring

times are now a thing of the past compared to the conventional method," explains Damien Wunderlin. Viewed holistically, waste is reduced and productivity increased, which benefits the overall efficiency of the production process.

New LaserSmart 501 gives precise shape to PCD

"In the past, key features of a PCD tool, such as its circular chamfer or chip grooves, had to be produced on separate machines after EDM eroding. The new LaserSmart 501 puts an end to this; it completes the entire process in a single step. This saves a considerable amount of time and increases productivity," says Damien Wunderlin. "In addition, a high level of precision is achieved by means of laser technology, as unlike eroding, the laser cuts through the diamond grain smoothly. This results in extremely sharp and clearly defined cutting edges. The result during PCD cutting by chip removal is smoother surfaces thanks to the circular land as well as orderly chip removal via the corresponding chip grooves. If necessary, effective chip breakers can also be used for targeted chip control."

To simplify the machining and handling of monoblock tools, Rollomatic has added a HSK63 workpiece holder in the LaserSmart 501 and integrated a standard automation process. In this way, a wide range of different tool geometries can be loaded and machined with the job manager without operator intervention.

"Redesigning the machine enables us to enlarge the machining area to allow an even

GrindTec Preview

greater variety in tools. We have also managed to integrate a FANUC robot without changing the machine's footprint," adds Damien Wunderlin. A further plus in the new model is the 3D simulation program: The tool can thus be visualised, including all machining procedures even before the machinery is loaded and the laser is first activated. In addition, the software is



very simple and easy to operate facilitating an intuitive tool design and thus simplifies the entire production process.

A helping hand in the form of a robot

Using industrial robots is also an important element in creating more autonomy and efficiency. Rollomatic has been involved in developing advanced human-like robots for some years now. This has resulted in the dual-arm NEXTAGE robot. It can support traditional robot units and increase the productivity and profitability of customerspecific processes by taking on, to a certain extent, demanding and laborious tasks and carrying out easy and repetitive activities. "One possible scenario, for example, is one where the robot takes a finished tool out of the machine and brings it to the measuring station. This gives the machine operator more time to complete other tasks with more added value." says Damien Wunderlin.

Software experts provide information In order to program precision cutting tools accurately and without any complications, Rollomatic provides the right solution in the form of VirtualGrind®Pro. Even in its latest



version, this software provides useful innovations again. Damien Wunderlin says: "Additional sample files as well as machine animation form part of this, as does a function that makes it easier to program new tools. Our software experts will be available to answer all your questions regarding the features of VirtualGrindPro at our booth."

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Hall 5 Stand 5098



- DANOBAT Expert solutions
- DANOBAT Digital
- **DANOBAT** Services

Technologically advanced grinding solutions for precision machining

Everything starts with learning the challenges of your grinding process, operating requirements and production flow, to later transform this know-how into a customised solution. The solution consists of the machine itself and all related processes. We also guide our clients towards a new era, which is the era of industry 4.0 where we create even more value for them. Our machines include our technology DATA SYSTEM - A Complete monitoring package.

 $\begin{array}{l} \textbf{DANOBAT} + 1 \; Sturrock \; Way \cdot Bretton \cdot Peterborough \cdot Cambs \cdot PE3 \; 8YJ \cdot United \; Kingdom \\ \quad \cdot T + 44 \; (0) \; 1733 \; 265566 \cdot danobat!td@danobat.com \cdot \textbf{www.danobatgroup.com} \end{array}$

DANOBAT presents its latest developments at GrindTec

At GrindTec, DANOBAT will be presenting technologically advanced grinding machines, as well as a hard-turning lathe that achieves grinding precisions.

In addition, the company will avail of this opportunity to share its digital value proposition, composed of in-house technological developments based on Industry 4.0 concepts, with the aim of advancing the creation of intelligent manufacturing spaces, fitted with interconnected equipment and capable of autonomous operation.

Maximum rigidity centreless grinding

The ESTARTA-650 centreless grinding machine is a solution characterised by being one of the most rigid grinding machines on the market. It was designed to meet current high-speed manufacturing demands for the purpose of significantly improving the cycle times and maximising production.

The main advantages of this solution are its high precision, a 30 percent rise in productivity and great rigidity.

This development can achieve 120 m/s in throughfeed, minimising the generation of vibrations. Working at great speeds with maximum vibration absorption is a key feature for successfully carrying out highly demanding grinding processes.

It is fitted with linear motors, a granite bed, a drive head fitted with an additional support that does away with the cantilever, and a novel damping system.

Meanwhile, a rolling guide system affords the machine greater sensitivity in movement. This last feature implies the elimination of the hydraulic component, making the ESTARTA-650 an environmentfriendly sustainable grinding machine, requiring less consumption and maintenance.

Grinding quality with turning flexibility

DANOBAT has years of experience in grinding and turning and based on knowledge of these two technologies, the LT-400 was developed.

High-precision turning machine for hard turning and with grinding capability is a development that is characterised by achieving maximum quality results with



great flexibility and adaptability to the client's needs.

The LT-400 adjusts perfectly to the demands of short-run manufacturers, who are required to frequently modify the type of parts they manufacture, but who also request the precision of the grinding technology.

The machine manages to adapt to manufacturers' different runs with maximum quality, thanks to the addition of a granite bed affording thermal stability and greater vibration damping.

It also has cross slides equipped with contactless hydrostatic technology, ensuring zero wear in the guiding system, preventing the stick-slip effect and offering great damping capacity. The hydrostatic system ensures thermal stability through constant control of the oil temperature.

The linear motors of the X and Z axes are controlled by optical scales cooled to a controlled temperature. These motors significantly lengthen the maintenance intervals.

Also of note are the head fitted with hydrostatic bearings and the integrated motor, both of which are cooled.

The machine is fitted with a mobile tailstock driven by a linear motor which helps speed up the process of setting up the change of the workpiece.

This lathe meets the requirements for manufacturing hydraulic pieces, bearings,

spindle nuts and parts for equipment thanks to its capacity for machining high-hardness materials with precision to less than a micron.

A solution for non-cylindrical shapes and radii

The IRD-400 grinding solution offer at GrindTec includes internal, external, surface and radius grinding, a solution especially designed for machining dies and moulds.

The main advantages offered by this development are the maximum precision results obtained for pieces with high geometric complexity and with high productivity.

The grinding machine achieves highly accurate finishes, thanks to its B0 axis which swivels up to 91 degrees. Axis control means complex internal shapes can be made using one single wheel and in one contour line, thus maximising productivity.

With this model, the four-spindle turret includes a measuring probe integrated in the software with which the starting position of the workpiece can be detected. This ensures that, on the final finishing run, the system reaches the required measurement with precision. In round contours, roundness deviations of $0.5 \,\mu$ m can be reached.

Another of the specifications of this machine is the high degree of exact synchronisation of all the movements of the axes, including the rotation axis of the

GrindTec Preview

workpiece (C0), thus enabling eccentric grinding. This feature means that complex geometries can also be machined with the aid of coordinate grinding, while square, rectangular or freeform shapes can be made to great precision.



Vertical grinding of complex geometries

As part of its offer of vertical grinding machines, DANOBAT will take the VG-800 to GrindTec. The development, a result of a great effort in engineering, which can be appreciated in its compact design including independent slides for maximum precision in positioning, offers a high degree of customisability and can be adapted to meet the requirements of each client.

The VG-800 range has a turret enabling a large range of configurations which afford these machines the necessary versatility and flexibility to complete different machining processes in one setup.

It fully adjusts to the client's machining needs due to its capacity to incorporate different technologies to carry out grinding, turning, drilling, boring and milling operations as well as measurement processes.

This new machine head is fitted with a high frequency spindle for internal grinding and a tangential spindle, both of which were developed by DANOBAT.

The VG-800 solution has a tool with a capacity to measure internal, external diameters, surfaces and cones, permitting intermediate measurements and offering flexible solutions for reaching high precision machining.

In addition, the C-axis includes hydrostatic technology ensuring roundness to less than a micron and an optimum surface finish.

This VG-800 comes with DANOBAT DoGrind software with a program library for grinding, turning and measuring as well as a module for energy savings and sustainability.

4.0 technologies for the automation of real manufacturing environments

Over the course of the fair, DANOBAT will explain its focus on industrial digitalisation, which is structured around an offer of intelligent developments using 4.0 technologies, with an aim to forging ahead in the automation of real manufacturing environments.

By way of an example in this respect, the company has developed Smart HMI, an intuitive interface aiding the operator and facilitating the use of the machinery, thus raising productivity.

This allows quick and easy access to all the information on the status of the machine and its operation in a centralised fashion. Moreover, its design enhances usability and user experience.

Smart HMI helps optimise maintenance cycles, as it shows the information relating to the status of the workpieces based on usage time, provides automatic notifications and maintenance instructions and improves reliability thanks to the self-diagnosis operations.

The main functions include logical handling of control, documents on screen, assistance for identifying faults, monitoring of energy consumption, as well permitting the use of communication protocols.

The company has also developed a platform for capturing, storing and processing data called Data System, which means the status of the machine can be monitored.

This keeps the user informed of the situation and the working of the manufacturing process in real time, it lays down patterns, identifies tendencies, anticipates faults and implements intelligent maintenance strategies.

DANOBAT Hall 5 Stand 5005

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23

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Schneeberger brings a complete range of solutions to GrindTec

The new corvus NGB was the main attraction on the Schneeberger stand at EMO 2017. The machine for producing and regrinding broaching tools, granulating cutters, racks and much more, features extended travel paths, more power, faster feed speeds and modern design.

Optionally available as C or B type with five or six axes

With up to 24 kW (S1) grinding performance, the model displayed at EMO featured over 2,100 mm axis travel path in the X direction and 400 mm in Y and Z. The stability and turning torque were also increased. Accessories like a hydraulic tailstock, dressing unit, and diverse magnetic clamping plates are also available.

Dynamic and ultra-precise grinding for inserts and other production parts

The kinematic concept of the Sirius NGS 6-axis grinding machines is ideal for processing smaller workpieces. Driven by linear and torque motors, the machine can grind extremely quickly and precisely.

Processes for unmanned production, grinding wheels up to a diameter of 300 mm, in-process measurement and dressing provide this grinding station with extreme flexibility and enormous autonomy. This can be increased even more with options like a 7-fold wheel changer or STACK with 10 palettes. Thanks to diverse clamping systems like TTC, cartridge, ANVIL, RPC, or other customer-specific solutions, it can clamp any piece.

The integrated FANUC 6-axis robot masters complex tasks like multi-side





grinding for parts, laser engraving and ultrasonic washes.

High-end tool grinding machine

The geminiNGM grinding centre is perfect for demanding tasks. High-performance flute grinding, profiling for hob cutters with high-frequency relief grinding, non-circular grinding and a high degree of automation make this machine a diverse and productive processing centre.

Features include: HSK 50 or HSK 80 double grinding spindle; direct drives; capacity for workpieces up to 450 mm long; grinding wheel diameter up to 300 mm

Options comprise: loader with 2 or 4 palettes; alternative STACK loader with 10 palettes; HSK 50 grinding spindle with automatic clamping; AWL loader for up to 72 grinding wheels; direct drive grinding spindle with 24 Kw (S1).

CADCAM grinding software

Live demonstrations of the new Qg1 software were displayed to visitors at EMO using multifunctional tables and presentation screens. Technical specialists were able to test the program themselves to experience the benefits of the new software.

Numerous properties of this state-of-the-art grinding software were presented with concrete examples by application engineers. For example, machine simulation was presented, together with a viusalisation of the complete grinding process, including periphery. This also



included collision detection with visual highlights of all collision points. Total and remaining grinding time are also displayed.

The module for grinding inserts with drill tips and ball nose was perfected, as was the processing of standard and form reamers with spiral and axle angles. The programming of the band saw milling cutter and grinding of cylindrical and non-circular shapes was also redefined. Profile step drills with a spiral or axis angle and centring or deep hole drilling and countersinking are additional tools that can be operated with CADCAM grinding software.

SCHNEEBERGER Hall 3 Stand 3064

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Stähli laps the competition

Stähli Lapping Technology Ltd, headquartered in Switzerland and with subsidiaries in Germany, the USA and China, specialises in double-sided flat honing, lapping and polishing. The company offers contract work as well as its own machines, including process development in all round packages.

At this year's GrindTec exhibition in Augsburg, Stähli will show the new machine type FH3-505. It is purpose-built for automation and couples the two positive aspects: highest quality from flat honing with planetary kinematics and speed of the



swivel change over system. Normal flat honing machines have one bottom and top flat honing wheel with CBN or diamond abrasives, with carrier discs having to be moved in and out of the pairing. The FH3 system has two bottom wheels that can swivel 180° back and forth and the carrier discs stay inside the assembly for the whole time, making automating the system much easier.

The new swivel system of the FH3 machines with two lower wheel assemblies allows the exchanging of the whole lower assembly, including wheel, carrier discs and workpieces, in one swift movement once the machine has finished flat honing. On the machine side, workpieces are being ground while on the one outside the actual machine an automated handling can easily reach in from top and unload ground and reload raw workpieces for the next cycle. This will roughly translate to a 30 percent time saving, while the automation cost can be reduced around 50 percent compared to a classic system with carrier discs moving in and out of the machine and large buffer

zones. Another machine on display on the Stähli stand at GrindTec will be the classic FLM 500 lapping and polishing machine. This is the smallest machine in the Stähli high-precision production lapping



machine line for work with loose abrasives. It has been optimised over many decades now and scores points with highest quality, reliability and user friendliness.

Stähli Lapping Technology Ltd Hall 4 Stand 4041

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ZOLLER announces technology premiere at GrindTec

Experts from a world-leading tool pre-setting and inspection company are ready to share its knowledge with thousands of visitors at an international trade fair for grinding technology.

ZOLLER has installed more than 38,000 pre-setters and measurement machines worldwide, complemented by unrivalled software solutions, as part of its mission to help manufacturers make better products more efficiently.

At GrindTec 2018, engineers from ZOLLER will display some of its latest innovations alongside exhibitors from almost 30 countries. These include the premiere of the new »mµFocus«, which makes it possible for manufacturers to measure both roughness and cutting-edge preparation with a single device, with the highest degree of precision and reliability. This best-in-class technology is particularly well suited for very smooth surfaces, such as metallic, and is supported by intuitive »pilot 3.0« software for rapid results and graphical analysis.

Also to be unveiled is the new and

improved functionality on the »pomBasic«, a compact, ergonomic and robust universal 5-axis tool inspection device that specialises in the process-oriented and contact-free measuring of drills, milling cutters and countersinks.

Using »pomSoft« software, it is now possible to create measuring macros and allocate them a tool ID number. Operators just scan the tool and call up its ID; the saved data helps to bring the cutting tool into the right position in every measurement repetition, arming every user with knowledge of how tools need to be measured and thus leading to huge time savings.

Through its extended interfaces GDX2.0, GDX2.1 and to NUM, ZOLLER representatives will show how they are helping to satisfy the 100 percent checking, traceability and process safety demands being placed on grinding and sharpening businesses as well as tool manufacturers, while reducing machine down times to a minimum.

In the UK, ZOLLER is dedicated to



supplying tool pre-setting and analysis equipment, making it unique in its ability to offer impartial, unrivalled expertise and support. As well as ensuring tools are of the right quality to create accurate and top-grade parts prior to machining, ZOLLER also provides total tool management solutions to further streamline business processes.

Zoller UK Tel: 01283 499566 Email: info@zoller-uk.com www.zoller-uk.com

Hall 1 Stand 1020

ISOG has trade fair fever

With just a month to go until GrindTec 2018 opens its doors in Augsburg, ISOG Technology is looking forward as always to meeting existing and prospective customers on its stand in the usual position in Hall 7, where it will combine top class technology with typical Bavarian hospitality. Upper Bavarian cosiness will be brought to the exhibition hall, courtesy of an Alpine beer garden, where you can enjoy a fresh beer and satisfy your hunger with something hearty.

The tool grinding expert will be showcasing two grinding centres, the ISOG 22 and the new ISOG 24, as well as well as demonstrating numerous interesting refinements for dry grinding.

An up-to-date ISOG 22 will also be presented. On the GrindTec stand, you will be able to see for yourself how the revamped classic continues to be improved and once again offers some new details for 2018.

The ISOG 24 flagship machine will participate in the "Tool grinder of the year 2018," with the best tool grinders meeting in the exciting finale. The competition is being organised by the trade magazine "fertigung" for the seventh time, in this case in cooperation with ISOG. This is why you will find another ISOG 24 at the "fertigung" stand during the entire fair, providing you with even more opportunities for you to get to know the new, versatile grinding centre better. In addition, ISOG is planning a "Walk the GrindTec" together with well-known partners; a new participatory action offering you interesting contacts, information and experiences at the trade fair.

The ISOG 24 is considered the grinding machine of the future and the new generation model has been set up at KGS Tilburg B.V. in the

Netherlands. Owner Tijn Kruissen is a fan of the new grinding centre and has been using the new precision machine since August around the clock.

Four ISOG experts accompanied the ISOG 24 to its new home, prepared for and looked after its installation, set up the machine, commissioned it and began grinding. Several days were originally planned for basic training and instruction, but as it turned out, normal grinding was under way on the second day after commissioning and production has been running ever since. The Dutch operators were intimately familiar with the NUMROTOplus software already and the new machine did not remain foreign to them for long.

Tijn Kruissen says that KGS Tilburg is highly satisfied with the ISOG 24 and has big





plans for it. Currently he is operating the machines exactly like the competing machines, because he wants to make direct comparisons. The grinding programs on the ISOG 24 will be optimised in the next step, realising its higher performance. Its production will then be considerably faster compared to the other machines. KGS Tilburg has already made a request for the coming year; they want to take advantage of the ISOG 24's flexible, modular system by replacing the 105-slot chain loader with a 315-slot chain loader.

The market readiness of the ISOG 24 is also keeping the comany busy in Weilheim. Potential customers having been beating a path to ISOG's door, with many wanting to know more about the new machine generation and find out what it can do for their business.

The insolvency of ISOG is a thing of the past, quite officially now. On 5th May last year, the competent court of law closed the insolvency proceedings, allowing the company to steer full speed ahead again.

ISOG is doing well. Economically, it's years since ISOG was in a situation as good as it is now, with its new partners and investors. Technologically, it is self-confident, with the new ISOG 24 setting its own standards in the sector, just as the ISOG 22 alias S22 did for years.

ISOG Technology GmbH Tel: 0049 881 6880 Email: info@isog-technology.com www.isogtechnology.com

Hall 7 Stand 7067

Non-stop perfection

The quality of stamping, forming and cutting tools can be improved considerably by finishing with the DF and SF machines from OTEC. Smoothing, polishing, edge rounding, deburring and removing droplets are typical finishing tasks which produce a dramatic improvement in workpieces. The DF Tools series of drag finishing machines with manual loading and unloading are ideally suited for this area of application. The new, integrated automatic door enables workpieces to be changed even faster than ever.

Especially when a company grows in size and the number of items to be produced



increases, a fast and efficient finishing system becomes more and more important. With the SF1 ILS (Integrated Loading System) with chain loader, OTEC sets a new standard in automated precision finishing. This machine is specially tailored to the requirements of the toolmaking industry and its automated loading system delivers clear cost benefits.

The SF1 ILS features a chain loader with 64 positions in loading sleeves that can vary according to the diameter of the tools. The machine can process different tools ranging between 3 and 32 mm in diameter in a single batch. This is achieved by automatically changing the workpiece and chuck adapter as required. When the finishing process is complete, the tools are returned to their loading sleeves. Tool change time is approx.14.5 seconds. Depending on the finishing process and the tool geometry, processing times are between 30 and 300 seconds. The SF1 ILS is equipped with a lifting unit for incoming tools and is suitable for both wet and dry finishing.

OTEC is a medium-sized manufacturer of



drag finishing, disc finishing and stream finishing machines. Founded by Helmut Gegenheimer in 1996, the company has steadily established itself on the market by developing innovative new machine concepts and numerous patented processes.

OTEC Präzisionsfinish GmbH Hall 1 Stand 1005

UK Agent: Fintek Tel: 01706 825819 Email: info@fintek.co.uk www.fintek.co.uk

Fire protection for grinding machines

Kraft & Bauer, whose fire-fighting systems protect more grinding machines than any others, will be exhibiting at Grindtec 2018. Many of the world's leading OEMs of grinding machines fit Kraft & Bauer fire systems, including Rollomatic, Walter, Tschudin, Jones & Shipman and Bahmuller, with several thousand systems being sold every year.

Kraft & Bauer UK Ltd supplies major machine tool manufacturers and distributors



with these fire protection systems and also offers a full retrofit and service support facility for 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 CO² 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.

Kraft & Bauer UK is exhibiting at Grindtec in order 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 manufactures and end users is available from Kraft & Bauer's UK website.

Kraft & Bauer UK Ltd Tel: 024 76 229477 Email: sales@kraftandbauer.co.uk www.kraftandbauer.co.uk

Hall 3 Stand 3079

Small dimensions with huge potential

Generating grinding with dressable tools is very productive

Workpieces with interference contours, however, such as two gears on one shaft, impose limitations on conventional grinding worms. In order to avoid time intensive processes such as profile grinding with small tools or honing, the tools have to be configured to be very small. This is possible by optimising the worm, tooling and technology accordingly to fit the workpiece and machine. Generating grinding with dressable tools is a common process for series production. Despite the auxiliary times for dressing, the advantages prevail: cutting speeds between 63 and 80 m/s provide high productivity. This is accomplished with conventional tools such as grinding worms with a diameter of 300 mm and approximately 5,000 - 7,500 rpm.

The large tool diameter, however, causes problems with interference contours because the tool requires room next to the gear to finish its grinding path. Typical examples are a bearing seat or an adjacent gear near the gear to be processed. It is possible to utilise tools with smaller diameter, but unless the rpm is increased, the result would be lower cutting speeds. Furthermore, standard machines are generally not capable of accepting small tools or processing workpieces with such small centre distances without encountering interference conditions. Conventional generating grinding machines require a minimum tool diameter of at least 170 - 200 mm. This is why manufacturers had to resort to other, less efficient processes for critical workpieces.



Small generating worms

Conventional processing of interference contours

The traditional process for hard finishing of gears with interference contours has been discontinuous profile grinding or gear honing. Both processes are suitable for complex components. However, they are not as productive and economical as continuous generating grinding. The outside diameter of dressable and non-dressable profile grinding wheels can easily be reduced to 30 - 50 mm with CBN plated wheels. They also do not require as

much axial clearance next to the gear being processed compared to a grinding worm. However, this process does involve long auxiliary times. Another alternative is gear honing, which is a process during which the profile of the honing ring meshes with the workpiece and removes material. Due to process-related reasons, however, the cutting speed of honing is very low which in turn demands higher operating forces. This process is therefore not suitable for gears with large modules or large gear widths as the forces during processing would negatively influence quality, cost and productivity.

Despite these disadvantages manufacturers had to resort to either of these processes even for large series manufacturing. Continuous generating grinding of interference contours had not been an option due to lacking capabilities of gear grinding machines. The dynamic demands to tool and workpiece drives, in particular, were too high. Meanwhile, new market developments have closed the gap.

Continuous generating grinding with small tools

KAPP NILES developed the KX160 TWIN and KX 260 TWIN gear centres specifically for hard finishing of gears with interference contours using the continuous generating grinding process. Thanks to high speed grinding spindles these machines are now capable of generating grinding gears that require a tool diameter as small as 55 mm. In combination with a maximum possible tool width of 180 mm, this allows for processing times and costs that have so far not been possible for gears with interference contours while at the same time meeting the quality demands common to series production.

Thomas Nitzsche, project manager for small grinding worms at KAPP NILES, explains: "A typical tool drive has max. 7,500 rpm. In order to reach the same cutting speed with a small tool, an rpm of up to 25,000 is necessary, depending on the tool diameter. This creates completely different forces than commonly expected on traditional machines and the workpiece must rotate faster proportional to the tool rpm. KAPP NILES specifically considered this and provided the standard workpiece spindle with 5,000 rpm."

Apart from the high forces, restricted space also posed a unique challenge for the developers: each tool required a stable, quick-change mounting and the tool arbor had to accommodate the entire sensor and dynamic technology. The machine detects contact between workpiece and grinding tool, or grinding tool and dressing tool respectively, via structure-borne noise sensors. Automatic balancing of the tool arbor on the machine is integrated into the arbor itself, as well.

Shorter auxiliary times thanks to second workpiece spindle

In order to increase productivity yet more, the machine concept includes two identical workpiece spindles, which are positioned on the indexing table opposite each other. While one workpiece is processed on one spindle, another workpiece is automatically unloaded and loaded on the other workpiece spindle and then aligned. This reduces the auxiliary times to a minimum. The machines are suitable for external, spur and helical gears. Optimal measuring systems determine profile and flank, runout and gear width.

GrindTec Preview

Thomas Nitzsche continues: "With these two gear centres, we are targeting high production volumes of large and series manufacturing for gears of high quality requirements. It was therefore important for us to explore all possible options to maximise productivity. Obviously, in addition to the small diameter tools, these machines can handle larger tools with diameters of up to 200 mm as well. As such, they are quite suitable and not to mention economical for processing of workpieces without interference contours." These small generating grinding worms have definite advantages over profile grinding with CBN wheels. The following comparison demonstrates this clearly:

Small generating grinding worms in direct comparison

Dr. Sergiy Grinko, a key contributor to this technology development at KAPP NILES, presents two typical cases: "If two gears are positioned on one axis with little distance between them, there is insufficient room for a generating worm. That means, one would have to use profile grinding or small ceramic worms." The image below demonstrates such application.



Generating grinding of a gear with interference contour

Sergiy Grinko calculated the cycle time for one specific customer workpiece. The result: non-dressable profile grinding with a CBN wheel required a cycle time of 5.4 minutes versus 2.9 minutes for dressable generating grinding with a dressing interval of 25 workpieces. An additional example shows a gear with runout in the bearing seat:

Sergei Grinko explains: "A normal gear has a root diameter larger than the diameter of the bearing seat. In some cases this reverses and the runout may happen in the bearing seat. A worm with conventional diameter can therefore not be used. And even in this case does the small grinding worm offer time savings: The example demonstrated that the processing with non-dressable CBN profile grinding wheels had a cycle time of 1.8 minutes versus 1.2 minutes



Example of a gear with a hob breakout

with dressable generating grinding. The dressing interval reached 74 workpieces. Properly utilised, the smaller tools result in a clear productivity increase and present more than just an alternative to discontinuous profile grinding and gear honing.

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Switzerland, Germany, USA, China

Supfina to unveil fine grinding solution at GrindTec

When GrindTec opens its doors in Augsburg, attendees will find the Supfina Grieshaber stand with the motto "High-precision fine grinding." In addition to the two models of its Spiro series of machines, the F5 and the F7, the Wolfach-based company is excited to announce that its 120 m² stand will also unveil the next big development in fine grinding.

A leading innovator in the field, Supfina ensures that its customers always remain the center of attention. Working closely with them, the company develops tailor-made solutions with a strong focus on precision, efficiency, and automation.

Oliver Hildebrandt, managing director of Supfina Grieshaber GmbH & Co. KG, has this to say about the company's eagerly anticipated product launch at this year's trade show: "Of course, we will provide yet another answer to the needs of the market at GrindTec in March. We don't want to reveal too much, but we can tell you this: the Supfina Spiro success story has just begun."

Fine grinding is now even more economical

If precision in the micron range is required, Supfina has the answer. In addition to superfinishing, which is mostly used in the automotive and roller-bearing industries, the Wolfach-based manufacturer has applied its considerable know-how to the precision abrasive-finishing market with a range of innovative products.

Manufacturers have three production technologies from which to choose. If maximum stock removal and a fast cycle time are needed, then double-disk grinding is ideal. If geometric dependencies are in play, manufacturers can achieve the highest surface quality with flat finishing. Finally, if high-precision surface parallelism is



required for a wide variety of components and materials, then fine grinding is the answer.

Double-disk grinding and flat finishing have long been an integral part of Supfina's expertise. The company introduced fine grinding in 2016 with the unveiling of its Spiro series. In doing so, Supfina became the world's first full-service provider of solutions for the three most important flat-finishing processes.

Many fine grinding machine manufacturers also work as subcontractors. In contrast, Supfina concentrates solely on the development and production of its machines. Thus, it can assure customers from a wide range of industries that it is a partner, not a potential competitor.

Fine grinding not only focuses on precision and quality but also on cost-effectiveness and the potential for customisation. Supfina considers all these requirements when it designs its machines. Thus, customer-specific, low-cost systems with individualised automation are developed so that workpiece feed and processing are even more efficient.

From manual loading and unloading of workpieces to fully automatic systems with a stacking cell, a wide range of systems is available. Depending on the batch size of the workpieces to be machined and any required flexibility, optimum automation from a modular system can be selected and individualised. This combination of low-cost, standard equipment with customer-specific customisation is the key to cost-efficient fine grinding.

Supfina's Spiro series of machines is constantly being expanded. The first Spiro, the F7 can economically process workpieces with diameters of 5 mm to 200 mm and thicknesses of 5 mm to 80 mm. Meanwhile, its "little brother" the Spiro F5 can fine-grind workpieces with diameters of 4 mm to 150 mm and thicknesses of 0.5 mm to 50 mm. Remarkably, the F5 requires only half the footprint of the F7 and can process





workpieces with a maximum pressure of 400 daN. Supfina also now provides a wide range of automation options for the larger fine-grinding system. Customers can choose for the F7 not only an individual system based on workpiece size, but also a wide range of manual and automatic feeders. Shorter cycle and setup times promise further possibilities for increased fine-grinding efficiency.

All the Spiro machines have a number of features that exceed the obvious parameters of tightest workpiece tolerances, optimum flatness, unrivaled plane parallelism and superior surface finish.

Supfina Grieshaber GmbH & Co KG Tel: 0049 7834 866175 Email: info@supfina.com www.supfina.com

Hall 7 Stand 7025

Perfect surface finishing for every demand

International market leader, Rösler Oberflächentechnik GmbH offers total solutions in the field of mass finishing and shot blasting, painting and preservation systems, plus mass finishing consumables. In addition, Rösler offers a broad spectrum of surface finishing technologies, including deburring, descaling, desanding, polishing and surface grinding, for workpieces made from metal and other materials.

Headquartered in Germany and with plants in Untermerzbach/Memmelsdorf and Bad Staffelstein/Hausen, the Rösler Group also maintains sales and manufacturing branches in Great Britain, France, Italy, the Netherlands, Belgium, Austria, Serbia, Switzerland, Spain, Romania, Russia, Brazil, India, China and the United States.

Visit Rösler at the stand at GrindTec and find out about flexible system solutions for surface finishing. The specialist for surface technology will present the Rösler Surf-Finisher 700 with robot



handling as well as the R4/700 SF drag finishing system. Both models are especially appropriate for processing touch-sensitive workpieces. With years of experience and a large number of



With its plug-and-play concept, the compact, fully equipped Surf-Finisher 700 can be easily integrated into existing, automatic manufacturing lines

machine types, Rösler offers the right solution for almost all requirements.

Rösler Oberflächentechnik GmbH: Hall 7 Stand 7009

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Many ways, one goal: Perfect Tools.



Cutting Tool Grinding Machine WZS 70



Manufacturing in motion



With just a couple of months to go before the doors open to MACH 2018 at the NEC in Birmingham, visitor registration is now live. MACH 2018 takes place from the 9th to the 13th April 2018 and will be located in a new home on the atrium side of the NEC, in Halls 17, 18, 19, 20, 6 and 7. This is the first move of the show since relocating to the NEC when it first opened in 1976, and reflects the changing technologies the show covers. Visitors are invited to register early for their Entrance Pass and Fast Track Entry Pack by clicking here.

James Fudge, head of events at organisers the MTA says: "MACH prides itself on attracting top-quality visitors with real buying power and the ability to invest in new equipment. The new hall layout will help create a brand-new visitor experience which is easier to navigate, showcasing all the different technologies in action under one roof. It will be a more interconnected show, just as we have a more interconnected industry."

"For MACH 2018, we have worked hard to provide visitors with a new way to connect with exhibitors. Our smart badging system provides every visitor with an interactive badge, allowing them to collect information from exhibitors in a quick and effective manner, without the need to carry lots of cumbersome documents. Data is transferred live to the visitors' online portal, ready to download as soon as they leave the show. This investment by the MTA in smart badging reflects the digital nature of the advanced technology on show at MACH."

James Selka, CEO of the MTA, says: "The show will be 2018's biggest display of live, working technology. At the core of the show, exhibitors will showcase the latest developments in metal cutting, forming and finishing along with tooling, CADCAM and laser technology. The number of companies displaying additive manufacturing technology has grown considerably and exhibitors tell us they will be focusing on the digital factory, with more automation and connected manufacturing processes on display than ever before. New for 2018 is a specific IT for Manufacturing Zone, where companies offering connected solutions for the fourth industrial revolution will be on-hand with practical displays and demonstrations."

"So, whilst the show will still attract the decision makers, engineers, designers and researchers who work in manufacturing, it is now a great place for chief information officers looking at systems and chief data officers who are adopters of these disruptive technologies to find new suppliers and experience the latest solutions. The vibrant seminar programme at MACH will feature subjects such as digital manufacturing, disruptive technologies, additive





manufacturing and key 'meet the supply chain' networking sessions. The content is designed to provide clear thought leadership at a time when manufacturing is experiencing huge change, and we believe visitors should allow more than one day to experience everything MACH has to offer."

James Fudge concludes: "We know there are lots of regional and specialist shows people can visit to find out about manufacturing technology. The MACH difference is to bring all these technologies under one roof over a five-day period. With a single visit, companies looking to invest in and adopt any one of a number of new technologies can assess the options and be at the forefront of the fourth industrial revolution."

MACH was established more than 100 years ago by the Manufacturing Technologies Association (MTA). It is the largest manufacturing technologies event in the UK, attracting in the region of 600 exhibitors and more than 25,000 visitors. Taking place from 9th to13th April 2018 at the NEC in Birmingham, the biennial exhibition brings together the latest developments and best innovations. MACH provides manufacturers of all sizes and sectors the chance to network with key clients and prospects as well as gain insight into their needs and future vision for supply chain manufacturing. For more information visit www.machexhibition.com

The Manufacturing Technologies Association (MTA) is the UK trade association for the Manufacturing Technologies industry. The MTA represents the core of engineering based manufacturing and aims to promote the use and innovation of advanced technology in manufacturing.

Further information about the MTA and our members can be found at **www.mta.org.uk**

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The Manufacturing Technologies Association



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Advanced Grinding Solutions at MACH

Advanced Grinding Solutions (AGS) has booked one of its biggest ever stands at the forthcoming MACH show, where it will be exhibiting six machines. None of these machines have been exhibited here before and therefore many UK engineers will be getting their first opportunity to see this range of advanced grinding and finishing machinery - the widest range on display at the show.

Rollomatic, a leading tool grinding machine manufacturer, is demonstrating its intention to increase its market presence here by exhibiting its NP5 ShapeSmart machine in the UK for the first time. This machine is used by many UK cutting tool manufacturers to quickly and easily cylindrically grind carbide and HSS tool blanks to diameter and form shape, rather than to do so on multi-axis tool grinders where the blank preparation process on those machines takes considerably longer, is more expensive and is generally not as accurate. Cutting tool and punch manufacturers are invited to receive a demonstration on the many advantages of the Rollomatic NP5 and to understand more about Rollomatic's wide range of CNC tool grinding machines.

The Rollomatic machine is suitable for the grinding of components up to 25 mm in diameter and has an integrated robot loader with a capacity for up to 1,000 parts. The



Rollomatic NP5 machine



Parts made on a Rollomatic NP5 machine

NP5 grinds to mirror finishes, can control diameter size to +/- 0.0005 mm, and runout concentricity within 0.001 mm. Fast cycle times are assured due to Rollomatic's patented "Pinch & Peel" grinding process whereby the machine has the ability to mix a multi-pass rough grinding operation with a final through-feed pinch grinding pass and, if required, rough and finish grinding in a single pass. The NP5 machine is also able to grind non-round special forms and flats as required for punch tools. This is the first time that Rollomatic has exhibited a grinding machine here in the UK.

Rollomatic's line up is completed with its LaserSmart 501 machine that features the simultaneous 5-axis high precision laser machining of tools made from ultra-hard materials such as PCD, CVD, and natural diamond. The LaserSmart 501 processes multiple operations such as cutting-edge generation, chip breaker machining and cylindrical land machining in one complete setup and can produce cutting edges with a radius of under 1 µm.

Platit is also exhibiting in the UK for the first time and will be showcasing its latest Pi111 Plus coating machine; the first time that any coating machine of this type has been shown at a UK exhibition. The Platit machine being demonstrated will be supported by the presence of Dr Tibor Cselle, one of the world's foremost experts on coatings for cutting tools and topics will be explored, such as why tool manufacturers should invest in their own coating technology and what are the latest and best coatings for various milling and drilling applications.

The main application for Platit coating machines is the coating (usually TiN, TiCN, CrTin, etc) of end mills, form tools, drills, inserts, saw blades, and broaches. Platit offers cost-effective solutions, in order that tool manufacturers can coat their own tools instead of relying upon expensive subcontractors. Tool manufacturers that are driven to produce tools that last longer and cut faster also need to differentiate their products from their competitors and coating offers them the ability to do this. Cost saving



Platit Rainbow coated end mill

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is only one driver for a tool manufacturer to invest in a Platit coating machine; another important reason is to reduce the time from order to a finished product because no external subcontractor for coating tools can respond as fast as an in-house facility. Platit does much more than manufacture coating machines; it is constantly developing new coatings for its customers and offers a full consultancy service for end users to ensure that they are using the optimum coating for their applications.



Magnetfinish machine for cutting tools



Various tools on a Platit coating machine

Magnetfinish machines for cutting tools use a unique process that's been developed to dramatically increase the performance and lifetime of tools which last much longer and can be ran at higher speeds and feeds after being processed using Magnetfinish technology. Abrasive powder is processed by magnets across the surface of cutters with controlled but variable directions. The ground surfaces of cutting tools are polished and the cutting edges machined with a precisely defined and fully reproducible radius of between 3 µm and 50 µm.

Magnetfinish will be displaying its latest MF73 machine with two robots that accommodate automatic loading from pallets, combined with wash, dry and demag. This allows entire batches of tools to be processed automatically without any operator involvement. The processing times for cutting tools are extremely fast with the average machining time for smaller tools being in the region of 10 seconds.

High quality tools need perfect cutting edges. The accuracy of the radius has to be

extremely tight so that a high or low flute does not cause uneven metal removal, thus affecting part geometry, surface quality and cutting tool life. The cutting edges of the flutes must have no jagged edges, chips, cracks or other irregularities. The presence of these would mean that the cutter edges would be subject to early wear as soon as they contact the workpiece for the first time and would lead to a rougher surface finish being created and a shortened tool life. This is the first time that cutting tool manufacturers will be able to see a Magnetfinish machine here in the UK.

Tschudin will be giving its new proLine CNC Centreless Grinding machine its UK debut. Like other machines within the Tschudin range, it benefits from a unique axis arrangement that sees the work rest blade being mounted onto its own CNC axis. This allows components to be loaded to the centreless grinding machine outside of the working zone of the machine. 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.

The Tschudin proLine machine additionally features a world-first and patented 4th CNC axis to automatically move the regulating wheel vertically, to eliminate the need to adjust the work rest blade height to keep part geometry consistent throughout the entire grinding process. Thus, operators no longer need to worry about wheel wear and to manually adjust to compensate for it. Similarly, when changing to a new workpiece, the part programme can be recalled along with the optimum pre-selected and pre-defined grinding point and the regulating wheel will position itself automatically. This is an important advantage as it allows for much faster setup times and also for millions of parts across multiple batches to be machined to the same pre-defined condition without the need for operator input.

The Tschudin proLine centreless grinder will plunge grind parts with a length of up to 280 mm and with diameters from 0.1mm up to 180 mm. It has a 410 mm diameter grinding wheel and weighs 10,000 kg with its bed and spindle blocks made from natural solid granite.

FLP fine grinding, lapping and polishing machines will also be exhibited in the UK for the first time. The broad range of FLP



Tschudin proLine grinding zone

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machines includes both twin wheel - double sided CNC lapping machines as well as single sided lapping machines. Visitors to the AGS stand will see a relevant single sided machine from the latest FLP range with engineers invited to attend to discuss their requirements for the face machining of components.

FLP Double Disc or twin wheel machines have seven machines in the range offering a working disc diameter of between 540 and 1,300 mm. These are fitted with Siemens PLC controls, can all be offered with full automation via linear or robotic solutions and weigh between seven and 16 tonnes. These advanced machines are offered as high-precision versions with granite machine beds and the latest machine controls, drives and measurement technology. FLPs machines are in use across many branches of engineering, including automotive, aerospace, bearings, optics and ceramics.

Applications include the production of pump, bearing seals, fuel injection and transmission components. FLP machines ensure that components are produced to the closest possible tolerances and at the highest production rates. Operator friendly simple machine operation is ensured as is the lowest cost per machined component. FLP also manufactures in excess of 15 million parts a year for customers needing a subcontract facility. This comprises flat honing, fine grinding, lapping, polishing and deburring of components, including full process documentation, measurements and statistics. FLP will be exhibiting in the UK for the first time.



Sample parts made on FLP machines

Automation is now one of the most important topics for all manufacturers due to the need to fully automate production cells to remain competitive. The Handlingtech range of loaders is suitably

comprehensive, with FANUC or Staubli robots being used for handling parts from 1 g up to 700 kg. These are very versatile systems and are suited for loading a variety of machines. Various component storage solutions are available including the use of pallets, bowl feeders and conveyors. Siemens controls are used with software links to the donor machine's own control system for seamless handling tasks. In order to "add value" to the loading equipment, it is common for Handlingtech to incorporate other processes within their loaders, such as automated measuring and checking via a variety of gauges and cameras and also automatic washing, cleaning, drying, deburring, assembly, laser marking and packing.

Chris Boraston of AGS comments: "Most of the machines that we sell into the UK are automated and as each year passes it's clear that the need to automate increases further. This, combined with the need for loaders to incorporate other technologies such as washing, deburring, measuring or assembly, has meant that today loaders have become machines in their own right and it's now not uncommon for the loaders that we sell to do more, and therefore be more complex than the actual machines that they service. It's all about adding value to the load/unload process to reduce manufacturing costs and to reduce work in progress".

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

Apart from offering high stock removal rates to improve cycle times, combined with more consistent part quality by avoiding micro-cracks in the surface of sensitive parts, another large benefit of using Krebs wheels



HT loader

lies in large cost savings made possible by reducing wheel dressing requirements. This has the three major advantages of lower wheel waste due to less dressing, faster cycle times as wheels can be kept grinding longer in between dressing them, and a reduced spend on expensive diamond rollers.



Krebs Multo grinding wheels

Krebs and Riedel is developing new wheels all the time and these are added to the existing collection of over 60,000 different wheel types that are available from them. With such a huge variety of wheels, of course choosing the correct and most efficient wheel is no easy task, but customers can draw upon the experience of Krebs application engineers to arrive at the best one for the customer's specific application.

The range of grinding and finishing machinery receiving its UK debut can all be seen on the AGS stand .

For further information, contact:

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Email: sales@advancedgrindingsolutions.co.uk www.advancedgrindingsolutions.co.uk

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Grinding automation and more from RK International at MACH

RK International Machine Tools will be maximising its presence at MACH with an emphasis on the latest developments within its grinding portfolio in terms of machines on display. The five machines being shown are the Perfect X36 High Precision surface grinder, the Jainnher JHC 12S centreless grinder, the Robbi 600 ET 7 universal cylindrical grinder, the high precision Delta Rotax 7 rotary table horizontal spindle grinding machine and the Delta LC400 rotary table surface grinder. In addition to machines on the stand, visitors will also be able to discuss their requirements for a range of machining systems from turning and milling through to thread rolling, EDM and sheet metal equipment.

The Perfect X36 High Precision surface grinder features a 300 by 600 mm table with maximum distance between the table and spindle centreline of 600 mm. This capacity is backed up by a 7.5 hp (10 hp option) CP4 high-precision spindle, with pre-stressed adjustment and grinding wheel speeds up to 1,750 revs/min, with a maximum wheel size of 355 by 50 by 127 mm. The cross and vertical axes make use of linear slideways (box slideway optional on the vertical axis), while for added rigidity the x-axis remains as



a box slideway as standard. The Perfect X36 benefits from one-micron programmable resolution, thanks to its upgraded ADP PLC control, which is proving popular with more and more grinding shops looking for an easy-to-use PLC control to tackle their grinding work. The ADP PLC control allows multiple grinding cycle routines, including



A Jainnher JHC 12S centreless grinder

The Perfect X36 High Precision surface grinder

surface, criss-cross, plunge and pitch grinding. In addition, the machine can also be operated in full manual control using the standard joystick when required, but these movements are monitored and safeguarded by the PLC control. All of this helps to reduce the skill levels required to produce high quality components.

The Jainnher JHC12S centreless grinder can be configured with its servo-controlled, variable speed, regulating wheel. The machine can be configured with a grinding capacity of 1 to 25 mm diameter as standard, or with the optional workrest this can be expanded to 25 to 40 mm diameter. The machine on display at MACH will be fitted with an automated load and unloading system, where part loading will be via a hopper, pushing the part through the machine into a receiving tray. For added precision and machine longevity, the Jainnher JHC 12S 7.5 hp spindle features a precision ground, hydrostatic bearing assembly, providing minimal friction, therefore reduced wear and lateral displacement, along with extended wheel life under heavy grinding loads. Key features of the Jainnher JHC 12S include a maximum grinding wheel size of 305 mm x 150 mm (dia/width), a 205 by 150 mm regulating wheel, which can be tilted +5 degrees -3 degrees and swivelled +/-5 degrees,

MACH 2018 PREVIEW

micro table feed using the handwheel of 0.001 m, with a movement of 0.2 mm for a full rotation of the wheel. All of this is contained in a compact footprint of just $1,750 \times 1,350 \times 1,400 \text{ mm}$.

For universal grinding applications, RK International will be showing the Robbi 600 with the latest generation ET7 control system, which provides an advanced seamless grinding experience that helps to reduce the complexity of part programming, including dressing cycles. With 630 mm distance between centres, this semi-automatic, PLC-based machine provides users with outstanding versatility, allowing economical grinding of batches as small as one-off. Key features include the ability to grind components weighing up to 250 kg (300 kg optional), a maximum table swivel of +9/-5 degrees and workhead rotation of between 0 and 300 revs/min. For larger workpieces, Robbi has three larger variants within the mid-range E Series with 1,030, 1,530 and 2,030 mm between centre distances. The wheelhead contains a hydrodynamic spindle, rotating on anti-friction metal bushes that help to enhance surface finish quality, while its position is controlled to within 0.001mm by use of the incremental motor's encoder in a closed loop. For additional accuracy an incremental linear encoder can be specified. Alongside the Robbi 600 will be a demonstration of the optional standalone control pendant display featuring the latest SIEMENS 840D sl with Industry 4.0 capability.

The grinding theme continues on the stand with the Delta Rotax 7 a travelling column, rotary table, horizontal spindle grinding machine. As with all three machines in the Rotax series, the Rotax 7 features a



stabilised Meehanite cast-iron structure generating maximum rigidity for increased metal removal rates and improved flatness quality. Due to the travelling column design, there is no 'fall-off' of the wheel across the 700 mm grinding diameter. Accuracy and performance is also enhanced by use of full grip hydrostatic support on all machine axes and wheelhead, eliminating friction, machine wear and stick slip. The spindle motor is a 7.5 kW Mackensen hydrodynamic unit with a Mackensen hydrodynamic bearing on the front and a pair of pre-loaded precision ball bearings on the rear. The rotary table is supported by two pre-loaded high precision ball bearings with 25° contact angle (this changes to a hydrostatic journal on the two larger machines in the series) with drive provided by a torque servomotor, which can be equipped with electro-permanent magnetic chuck. Each machine is available with a choice of three user-friendly (full production with just half a day training) automation levels using Delta developed software on



The Rotax 12 travelling column, rotary table, horizontal spindle grinding machine

The Robbi Omicron 600 ET7 universal grinder

their CN and CN Plus control systems allowing self-diagnostics and un-manned running.

Completing the MACH machine line-up for RK International is the Delta LC400, part of Italy-based Delta's ELLE range of rotary/fixed/oscillating table, vertical spindle surface grinders. The Delta LC 400 rotary table variant is capable of grinding components up to 400 mm diameter and up to 205 mm high (distance between table and grinding wheel). The rotary table of the LC400 is controlled by asynchronous three-phase bipolar motors with 8/16 poles. The result is that table rotation can be as high as 40 revs/min. When combined with the vertical spindle, the result is a highly rigid and productive machine capable of high metal removal rates.

"The combination of grinding machines on display is an excellent cross-section of the ranges offered by our world-leading partners," says Simon Rood, director and general manager, RK International Machine Tools. "The range and capability on show highlights RK International's reputation as the UK's leader in grinding technology, able to meet the needs of customers across a diverse variety of industry sectors. We are confident that MACH will provide the perfect showcase for RK International's product ranges and technical ability, as such we have backed this up by taking the largest stand in the company's history at the show."

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Stand H19-314

Master Abrasives exhibits complete grinding solutions at MACH

Internationally recognised abrasives supplier Master Abrasives will be presenting a grinding machine by Micromatic Grinding Technologies at MACH alongside measuring equipment, abrasives and superfinishing devices.

This will be the first time Master Abrasives has exhibited at MACH for several years and the company has made many strategic changes since then. One significant development is the appointment as Micromatic Grinding Technologies' sole distributor in the UK and Ireland. With a showroom equipped to demonstrate the machines' capabilities, Master Abrasives is now offering a cost-effective and reliable option for hydraulic and CNC cylindrical, centreless and special purpose grinding machines.

At MACH 2018, Master Abrasives will be displaying the Micromatic eco 200 machine in the Grinding Zone, located in Hall 6 at the NEC.

Ian Meredith, applications engineering manager and stand manager for Master Abrasives, comments: "This will be the first exhibition for Micromatic Grinding Technologies machines in the UK and we are sure there will be a considerable amount of interest in this newly introduced brand of machines. Our stand team will include Martin Stevens, Master's resident expert on the Micromatic product range."

The machine being presented at MACH, the eco 200, is a basic but high-precision grinder which can be used for external, internal or face grinding applications. The machine is available with a range of additional accessories offered by Micromatic, including the digital read-out. Its small footprint and low cost combined with its ability to hold tight tolerances makes it a great economical entry model machine for tool rooms requiring precise and accurate repeatability of wheel slide within ± 0.001 mm.

Another new partnership with Thielenhaus Superfinish Innovation AG allows Master Abrasives to offer a complete solution to superfinishing applications with tape finishing devices as well as precision microfinishing films from other brands. The SL50 tape finisher has been set up in the Master grinding and finishing showroom since December and will be available for show on the Master stand at MACH.

The SL50 device has a double-side mounted tape contact roller, is equipped with sensors and can be integrated directly into a machine. It has an oscillation frequency of 300-1,400 double-strokes per minute. The device provides manufacturers with the

opportunity to cost-effectively apply precision machining methods to individual parts, small batches and prototypes using an existing supporting machine, for example a lathe or grinding machine. This allows manufacturers to achieve high-quality surfaces and geometric improvements on components such as gear shafts, rolls, piston rods and many others.

A new range of measuring equipment by Innovative Automation Products will also be exhibited at MACH. These will include a 2D height gauge, air gauge and profile



The newly introduced Innovative Automation Solutions measuring equipment will be on display at Master Abrasives stand



Master Abrasives will present Micromatic Grinding Technologies machine at MACH for the first time in the UK, alongside the Thielenhaus Superfinish Innovation tape finisher

projector which have been made available for viewing in Master Abrasives showroom. The RS232 data output feature on this equipment provides the option of evaluating measurement data externally with SPC software on a PC.

Since last participating in MACH, the Master brand has been expanded and strengthened to satisfy customer needs more effectively. Master Abrasives still offers a full range of grinding wheel specifications and dressing tools for a range of applications, but also now available is the economical range of wheels in storage cases which come complete with changeable plastic bushes to reduce bore size. In addition to new products, Master Abrasives has updated its literature in line with its brand's new look.

Ian Meredith concludes: "With our dedicated applications engineering team available to provide technical advice at MACH, we can present a cost-effective, high-productive solution including the machine, the right abrasives, coolant nozzles and dressers for a high-quality finished part."

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

Stand H6-442

Advances in performance superfinishing at MACH

Fintek will be showing the latest developments in performance superfinishing and mass finishing at MACH. The company is the exclusive UK agent for the world-leading OTEC Präzisionsfinish GmbH brand of disc, drag and stream finishing machines. It also provides a full subcontract service to precision engineers in aerospace, motorsport, medical device and general manufacturing.

For manufacturers requiring speed and capacity to meet in-line production needs, there have been significant advances in



automation. The OTEC SF stream finishing machines feature options including chain feed loading / unloading and full robotised operation.

SF machines can also be equipped with 'Pulsfinish', a pioneering and patented technology from OTEC for automotive and toolmaking customers. Pulse finishing, produces rapid relative motion between the media and metal workpiece by quickly alternating the direction of the rotating heads. Fast acceleration and deceleration amplifies the finishing forces exerted on the workpiece. This produces a perfect finish faster without affecting workpiece geometry.

Importantly, more speed to boost productivity has not compromised quality, with easily repeatable surface roughness values down to Ra 0.01µm possible. Deburring, edge-rounding and smoothing can take place in one process cycle, saving even more time.

The Fintek team is also keen to present its subcontract capability. With ISO9001 and AS9100 accreditation and over 30 years'



experience, the company can contribute a cross-industry problem solving capability to any manufacturer. If difficult to reach burrs, hard coating droplets, brittle edges, extremely thin parts or other problems prevent you from achieving the surface finishing quality required, it has the know-how to apply the latest finishing techniques to achieve the desired surface finish.

Fintek

Tel: 01706 82 5819 Email: sales@fintek.co.uk www.fintek.co.uk

Stand H20-42

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A secure hold for Xtrac gears with Eclipse chucks

A world-leader in transmission systems and driveline components, Xtrac uses a variety of magnetic workholding devices from Eclipse Magnetics to manufacture gearboxes for the motorsport industry. Several components make up the gear box clusters, including dog rings and selector forks, and are machined on site at Xtrac's 8,200m² purpose-built factory in Thatcham, Berkshire.

Components need to be securely held in place whilst allowing for thorough access for machining processes such as cutting, turning, grinding and milling. The most efficient and convenient method of doing this is by using magnetic chucks and workholding systems. Chucks provide improvements in production efficiency because they allow fast setup and minimal clamping time, enabling continuous machining with excellent access.



Every department at Xtrac uses some form of magnetic holding device, from the gear cutting department to the milling and grinding department. Xtrac's magnetic chucks of choice are from the Eclipse Magnetics range, which are used on a daily basis throughout the business. Most commonly used at Xtrac are the premium permanent magnetic chucks, which are ideal for medium to heavy turning on ring type components such as dog rings. The circular design concentrates the entire magnetism from the chuck into the workpiece, thereby ensuring excellent hold. Several Eclipse Magnetics radial pole chucks are used throughout Xtrac for machining dog rings. These chucks provide the option of partial

(variable) hold, and include through bores and blanking plugs. The radial pole of the chuck is radially balanced and uses a round magnet pack that rotates to switch, ensuring the chucks stay in balance when rotating. The chucks have thick metal top plates for high accuracy and a long lifespan, as well as high corrosion resistance which resists damage from coolants.

Mark Rampton, CNC

grinder at Xtrac says: "I've used these circular chucks all of my life and they are exactly what we need. They do what they say on the tin. They're very versatile, they minimise error and they enable me to grind the parts so that they are flat and accurate.

The chucks are easy to use and are definitely the most effective method of holding for us. It's the easiest and most convenient way of keeping machined components in place; without them we would need special tooling. The dog rings can be positioned and skimmed on the machine, allowing all sides to be machined and meeting tolerance requirements of within 10 microns."

Dozens of magnetic chucks are used on several different machines within Xtrac, including a Matsura 450 horizontal machining centre, a Matsura R+ 500 vertical machining centre, several Studer machines, a Jones and Shipman 1400X surface grinder, and a variety of other grinding machines.

Eclipse Magnetics' rectangular chucks are also used at Xtrac. Chucks can be fixed to the machine bed with clamps, and components such as selector forks can be positioned and held in place. The chucks are manufactured with steel and brass laminations and integral high-performance neodymium magnets in the top plate to enhance the performance.

Dave Lasenby, manual grinder at Xtrac says: "The Eclipse Magnetics manual rectangular chucks are perfect for us. Electromagnetic chucks just aren't suitable. The manual chuck provides a variable, partial hold to the machine, meaning that the component can be adjusted manually for particularly small or thin parts such as selector forks. Any existing distortion on





parts due to the heat treatment process involved in the manufacturing process can be corrected by ensuring a flat surface."

Xtrac provides complete package services to the motorsport and automotive industries, specialising in the design, manufacture and build of gearboxes and individual components for high performance transmission systems and driveline components. In order to satisfy the ever-increasing expectations of its customers, Xtrac meets the highest levels of quality in line with ISO 9001:2008 certification across the whole business. Gear cutting and manufacturing is extremely specialist, requiring high levels of accuracy and consistently meeting tight tolerances.

With virtually all of the world's top motorsport teams relying on Xtrac's specialist expertise, 90 percent of the components designed and manufactured at Xtrac are for the motorsport industry.

Eclipse Magnetics Tel: 0114 225 0600 Email: info@eclipsemagnetics.com www.eclipsemagnetics.com



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Pioneers of skiving³ technology

The first Liebherr LK 500 skiving machine is in use at the Italian gear specialists SIAP, an innovative investment that will increase both productivity and quality

The town of Maniago, Italy, is principally known for two things: knives and cutting tools. The whetstones of cutlers at the Còlvera stream, at the foot of the Carnic Alps, have been operated with hydropower since the 15th century, with the start of a big handcraft tradition from which an industrial centre developed. Since 1960, SIAP has been manufacturing gears and since 1988, as part of the international Carraro Group, gear boxes, axles and contract manufacturing.

"We are always growing", explains COO Paolo De Col. In recent years, the premises underwent constant expansion. "We have to add a new hall practically every year." This of course also means a continuous expansion of the fleet, which now includes over 200 machines, around 30 of which are from Liebherr. The most recent acquisitions were a LCS 500 generating grinding machine, a LC 300 gear hobbing machine and the LK 500 gear skiving machine, the first of its kind in a production environment.

Partnership with a long history

"We have a long history with Liebherr. Firstly, two Liebherr companies are our customers, the connection to the group has therefore existed for a very long time. Secondly, we opened a plant in India in 2003/2004, which we equipped with around 25 Liebherr machines," states Paolo De Col. "The parts were manufactured in Germany and assembled in India. Liebherr Machine Tools India was set up in Bangalore at the



The first LK 500 in serial operation

same time as our subsidiary. We believe in Liebherr India and Carraro, who was confident of the excellent quality of the machines in our production, released an order of 25 machines, thereby opening up the Indian market."

In addition, when it comes to gear skiving, SIAP demonstrated its huge confidence in the Kempten-based technologies. The



SIAP's machine park comprises 200 machines, with about 30 of them from Liebherr

company's first manufacturing gear skiving machine is in Maniago. Paolo de Col continues: "For us, skiving is a new and very interesting topic. Together with Liebherr, we have the opportunity to jointly develop a new machine with a new process. Liebherr is familiar with all challenges of mass production. We have access to the developers and can bring about improvements, both to the machine, and to the process and tools."

The Liebherr skiving³ (machine, tool, and technology) approach is also very effective in the collaboration with SIAP.

Focus on costs and quality

Luca Cadelli, sales manager of SIAP, responds to the question about why SIAP is mainly introducing the new technology: "The market requires this machining method. Gear skiving promises better quality while reducing costs. This combination is irresistible for our customers, because everyone pays attention to costs and quality." Luca Cadelli and Paolo De Col expect that the successful introduction of the skiving³ process will be critical for gaining a competitive edge in the medium term.

At SIAP, the LK 500 produces, for example, various internal gearings; a classic application for gear skiving, as here only the considerably slower gear shaping technology can be used. "We are extremely satisfied with the production speed", reports the COO. "The machine works roughly five times faster than our shaping machines. If we want to expand our production, we compare the procurement of a skiving machine to the purchase of three shaping machines in the latest generation." Other costs are included in this comparison: number of operators, installation space, tool costs and setup times. A single machine has clear benefits of course."

Even without the gear skiving machine, SIAP currently has a daily production capacity of 3,000 internal gears.

Skiving will partly replace the broaching process

SIAP uses five broaching machines for large quantities. As the broaches are very expensive for low volumes, due to the high tool and sharpening costs, SIAP uses

broaching for straight gears. The company expects a partial replacement of the process in the future with skiving.

"In the future, broaching will only be worthwhile for mass productions of part numbers with high volume. Especially for large toothed gears, the tool costs will decide whether we broach or skive", predicts Paolo De Col.

From a certain size, the broaching tools become so expensive that the process is no longer worthwhile. Another decisive benefit of skiving is that the quality remains consistently excellent across the entire tool life.

"The process is completely stable. Skiving thus satisfies four requirements: quality, cost benefit, consistency and reliability of the process."

As SIAP not only produces toothed gears but also complete gearboxes, for example for forklifts, the company has extensive process and quality competence. The latter is also reflected in the production equipment; test engineers examine the products in labs for metallurgy, measurements, and purity. One project is "clean production", the contamination-free production for preferably pure components.



Production Grinding

Skiving³ is popular especially for internal gearing

"We are always open to innovative approaches and technologies", concludes Paolo De Col. "We are therefore also happy to pursue the skiving³ path with Liebherr."

A display of trust which Liebherr appreciates has led to a fruitful partnership. The machine should be fully integrated in production by the end of the year and will manufacture the entire range of parts. Then SIAP will decide about more procurements, with another LK 500 is on the wish list.

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KLINGELNBERG presents smart measuring technology at METAV

In the Quality Area Forum at METAV in Düsseldorf, KLINGELNBERG will present its P 16 G Precision Measuring Center. Along with other companies, the company will show that measuring technology is an essential pillar of smart data and big data concepts.

The show takes place from February 20 to 24, 2018 with more than 600 exhibitors from over 20 nations again presenting their latest metalworking technologies. Gear specialist KLINGELNBERG will enjoy a well-positioned presence in the Quality Area in Hall 16, Stand A13, focusing on its "non-gear" expertise.

Flexible, precise, universal: the best of everything in one machine

Whether turning blanks, ground workpieces, circular blades, spacers for circular blades, or ball bearings, the new P 16 G Precision Measuring Center is purpose-designed, not to measure gear teeth but rather specifically for use in manufacturing axially symmetrical components. It is the only machine in Klingelnberg's P series to be equipped with software for dimension, form, and position measurement as standard. The software records diameter and cylindrical form/conicity; measures axial runout, evenness, and angularity; and delivers a wealth of information for quality management, as required. Hence, with this precision measuring center, there's no need for gauges. In terms of quality assurance, this universal solution for axially symmetrical components provides new opportunities to make a vital contribution to success, particularly in times of highly accelerated innovation cycles and growing requirements. Measuring and testing technology has become an essential pillar of smart production concepts.

Complete measurement of complex components - it couldn't be easier

Stringent precision requirements in series production and increasing component complexity both call for the best available measuring technology. The P 16 G is optimally designed for the production process, suitable for direct shop floor use, and can be employed along the entire production chain. After each manufacturing step, every feature can be immediately displayed graphically or in table format, analyzed, and statistically evaluated. This enables efficient process control and reliable management of production processes. The basic software also includes storage of statistical data for further evaluation, such as warning limit specifications. And the P 16 G is incredibly easy to operate. Potential customers at METAV are invited to experience this for themselves by taking a close look at the P 16 G – the KLINGELNBERG specialists will be on hand to assist all visitors with their expert knowledge.

Founded in 1863, the family-owned Klingelnberg company is one of the leading companies in the gear industry. Thanks to numerous innovations in the areas of calculation, production, and measuring technology, Klingelnberg maintains its leadership position in this sector. With its acquisition of Höfler Maschinenbau GmbH's core business in 2012, Klingelnberg has added machines for machining cylindrical gears to its range of products, reinforcing its position as a complete system provider.



Headquartered in Zurich, the machine manufacturing firm now develops and manufactures at its sites in Zurich, Hückeswagen, and Ettlingen, as well as Győr, Hungary. The company also maintains a presence with sales and service offices and numerous marketing agents all over the world. Klingelnberg solutions are used in the automotive, commercial vehicle, and aviation industries, as well as in shipbuilding, the wind power industry, and the general transmission manufacturing industry. Applications range from vehicle drives to aircraft turbine engines and cement mill gear units, to drive systems for ships and oil rigs.

With over 100 patent grants, the company continuously demonstrates its capacity for innovation. Above and beyond this, its 14001 certification and participation in the VDMA's Blue Competence initiative give credence to the company's sustainable, environmentally sound business practices.

UK Agent: Micronz Tel: 01352 758840 mark@micronz.com www.micronz.co.uk

Production Grinding

The zenith of precision for leading pumping technologies

NETZSCH, one of Europe's leading manufacturers of pumping technologies and their systems, has purchased a 'special version' Zenith 400 helical profile grinding machine from Precision Technologies Group (PTG) company, Holroyd Precision.

The Zenith 400 will be installed and commissioned at NETZSCH's manufacturing facility in Brazil during early 2018. NETZSCH will use the Zenith 400 to produce a range of pump screws. These will then be used in a number of the company's innovative pumping technologies, which include cavity, multi-screw and rotary lobe pumps.

Holroyd regional sales director, Steven Benn, says: "We are delighted that NETZSCH has recognised the high-precision capabilities offered by the Zenith 400. The immense flexibility that Zenith 400 machines bring to production strategies was also a major factor in NETZSCH deciding to place this high value order with us."

The Zenith 400 helical profile grinder

Representing the very pinnacle of Holroyd's helical profile grinding technologies, Zenith 400 models provide high stock removal rates and aggressive semi finishing, with production rates and accuracies tailored to the most demanding of manufacturing requirements. Encompassing advanced innovations and a new control system that



Precision grinding of dual-bodied pump screw on Zenith 400



Precision grinding of helical rotor on Zenith 400

incorporates development and production software, Zenith 400 machines have been designed to suit all user needs, in either research and development or mass production.

Three grinding capabilities, one machine

In standard form, the Zenith 400 is the first machine of its kind to offer all three grinding technologies: aluminium oxide, ultra hard plated CBN and vitrified, dressable CBN, effectively providing roughing and finishing capabilities on one machine. Holroyd Precision has also developed a process whereby ultra hard plated CBN can be used for rough grinding, after which a vitrified CBN finishing wheel can be used on the same arbor.

Steven Benn says: "This newly developed technique means we can use high-efficiency plated CBN for rough grinding and the versatility of the vitrified CBN process for finish grinding. The vitrified CBN enables us to change the shape of the wheel and re-dress the wheel in light of any wear."

Holroyd 3D CMM component scanning

In choosing the Zenith 400, NETZSCH has also been able to benefit from the unique Holroyd 3D CMM component-scanning probe with fully automatic compensation feedback. Offering class-leading accuracy and improved production rates, the scanning technology removes any need for off-machine component inspection. Instead, parts can be accurately ground then measured, with any deviations being automatically corrected before completion of the manufacturing cycle.

- Key features of Zenith 400 helical profile grinding machines include:
- Vitrified Al2O3, vitrified CBN and plated CBN grinding wheel options
- Accelerated setup, with fully automated grinding wheel balancing system
- Powerful, menu-driven touch screen programming
- High stock removal rates, aggressive semi-finishing and precision fine finishing
- Holroyd's unique on-board 3D CMM component scanning probe with full automatic compensation feedback
- High speed spindles and advanced in-process dressing systems to maintain profile accuracy and keep the grinding wheel in optimum condition
- •Complete integration with automated parts handling systems

Incorporating the brands of Holroyd, Holroyd Precision Rotors, Binns & Berry and Crawford Swift, PTG has established itself at the forefront of high precision machine tool design, build and supply. The PTG range includes ultra precision grinding machines for rotor, thread and gear operations; rotor milling machines; heavy duty lathes; deep hole boring machines; friction stir welding machines and special purpose machine tools for the manufacture of precision components.

PTG

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New cutting and grinding wheels for maximum performance and productivity

Metalynx wheels provide premium cutting and grinding solutions within MAX and PRO Performance line

As a world-leading manufacturer of abrasive solutions, Weiler Abrasives has now published its new Metalynx catalogue that introduces its latest series of Metalynx cutting and grinding wheels. The comprehensive new Metalynx product line is the first-choice solution for manufacturers regardless of whether you are looking for grinding, blending, cleaning bevelling, notching or cutting products.

The new Metalynx line incorporates a complete series of cutting and grinding wheels, flap discs and wire brushes. Selection has never been so simple, as the Metalynx brand includes the comprehensive new MAX Performance Line and the PRO Performance Line.

The MAX range has been introduced to maximise productivity, while demonstrating superior service life and cutting rates. Removing stock material effortlessly, the MAX performance line is suitable for applications on steel, stainless, Inconel, titanium and high nickel alloys. In contrast, the PRO performance line is a versatile series that demonstrates long product life for general purpose applications on materials such as carbon and stainless steel, structural steel, iron and general metals.

Both performance lines are available with a variety of grain, grit and grade combinations to maximise performance, regardless of your application. The MAX range optimises performance with its thin cutting wheels that deliver accurate, clean cuts whilst its dual reinforcement technology provides added strength for aggressive cutting. Furthermore, the MAX



line has a smooth outer layer that reduces friction and results in an effortless cut and reduced kickback while the contaminant-free wheels provide piece-of-mind for stainless fabricators concerned about workpiece contamination.

The MAX range is available in MAX Ceramic, MAX Aluminium, MAX Metal and MAX Inox & Metal product line ups, while the general-purpose PRO series is offered with Inox & Metal combined cutting wheels as well as metal cutting wheels. Additionally, the range includes combination wheels which offer flexibility and efficiency when switching between cutting and grinding applications. This is due to a specially engineered third layer of fibreglass reinforcement that provides the strength for grinding while maintaining a fast cutting action.

The Metalynx brand incorporates a wide selection of products that include thin cutting wheels and standard thickness wheels for angle grinders as well as small cutting wheels for die grinders, large diameter wheels for stationary, chop and gas saw variants. Metalynx also includes a complete line of grinding wheels and cut/grind wheels for angle grinders as well as flap discs. The flap discs include MAX and PRO variants. MAX flap discs are designed for demanding users who want to

maximise productivity and product life. PRO products are for users

who want value in an industrial product. These discs are available with Ceramic Alumina and Zirconia Alumina grain compositions with a variety of coarse to fine grit sizes.



The new Metalynx catalogue will also mark the arrival of the next generation of thin cutting wheel technology with the new Weiler Ultracut Series. With a true and precise 1 mm thickness and proprietary SOLID CORE technology that increases wheel density, the Ultracut exceeds expectations with astounding service life, reduced friction, plus a smooth and precise cutting action. This makes the new Ultracut wheels ideal for processing thin metal tubes, profiles, and sheet metal. For manufacturers aiming to maximise productivity, the Ultracut line can carve through material 20 percent faster than competitor products, while the SOLID CORE technology extends service life and reduces burrs with its smooth cutting action.

The new Metalynx catalogue also introduces a complete range of wire brushes for cleaning corrosion, scale removal, weld-cleaning and a host of additional jobs. The brush section of the new Metalynx catalogue has a variety of wire wheels, cup brushes, end brushes, stem-mounted brushes and bevel brushes in crimped wire and knotted wire configurations.

For further details on how you can benefit from the new Weiler Abrasives Metalynx brand of cutting and grinding wheels, flap discs and brushes, contact:

Weiler Abrasives Group Tel: 00386 3757 5225 Email: metalynx@weilerabrasives.com www.weilercorp.com/metalynx

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Challenge accepted

The automotive industry is facing upheaval, with new challenges affecting both the drive technology and the mechanical production of parts. Together with the manufacturers, TYROLIT is already working on innovative solutions for the future.

In the future, the number of vehicles equipped with electric drives will be increasingly high. Hybrid cars, which combine electric drive and internal combustion engine, will dominate the future automotive market. However, the new technology is still in its infancy and electric drives and their power supply still raise many questions. Consequently, manufacturers' drive concepts are currently numerous and fundamentally diverse, depending on the size and purpose of the vehicles.



In the medium term, both pure electric drives and hybrid drives will be available. However, manufacturers are working tirelessly on optimising the combustion engine to save on weight and improve combustion, and these will not simply disappear. Other keywords among development engineers are temporary cylinder deactivation, for example. New camshaft designs and modified combustion chambers are opening up new potential. The desired reduction in fuel consumption, like the continuous reduction in CO2 and NOX values, is achieved by optimising all vehicle components.

The technical production challenges facing manufacturers and suppliers naturally also affect the makers of machines and machine tools, including global abrasives manufacturer TYROLIT. By liaising closely with car manufacturers, TYROLIT is continuously enhancing its grinding tools to comply with the new requirements. In the last few years TYROLIT has created a broad portfolio of different grinding tools for manufacturing the required new components for the automotive industry. While the parts are becoming ever smaller and more delicate, the requirements for their surface finish are becoming ever more exacting. The tolerances of the workpieces are also becoming even finer. As a result, grinding tools must cut more easily than ever, while the grinding wheels must have a high porosity to ensure cool grinding. If components are hollow, for example, vibration can occur during the grinding process. In cases like this, the grinding wheels must have especially good damping characteristics, which TYROLIT achieves by means of innovative CFRP cores, for example.

New materials such as titanium aluminide, which are difficult to grind, are repeatedly throwing up new challenges for application and development engineers. At the headquarters of TYROLIT in Schwaz, Tyrol, the Research & Development team are working on providing innovative solutions for the relevant application to customers worldwide. Close collaboration with customers is the key. In most cases, it is not just the tool itself that is optimised, but also the local production process. The GENIS 2 product line, a vitrified bonded grinding wheel series with CBN, is a typical example of such a development, and is commonly used in camshaft and crankshaft production.

TYROLIT also constantly focuses its attention on finding the most cost-effective solution for its customers. This includes internal procedures and work processes. One example here is the grinding wheels from the POLARIS product family, electroplated high-performance CBN grinding wheels, the advantages of which are evident in the mass production of engine valves or turbocharger components etc. The long lifetimes of these grinding wheels, with no requirement to interrupt the process for dressing, maximise productivity and achieve costs per component that were previously





unachievable. However, since these grinding wheels are especially prone to potential axial and radial runout errors, which shorten their lifetime, comprehensive assembly instructions are provided in several languages. This is intended to ensure that the high-quality grinding wheels are also handled with the necessary care and used with optimum radial and axial runout.

Vehicle gearboxes are another component used to reduce emissions and fuel consumption. Around the world, the



trend is to increase the number of gears, to keep the engine in the best speed range for optimum fuel consumption. At the same time, the flanks of the gear teeth must have an improved surface, in order to minimise consumption and noise. Increasingly, these gears are pre-milled, hardened and then hard and fine machined using generating grinding and/or high-performance honing. For these areas of application, TYROLIT also offers product ranges of so-called MIRA grinding wheels for generating grinding, as well as MIRA REX honing rings and MIRA DDG dressing wheels. These products were all developed jointly with customers especially for gearbox production.

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Grinding Wheels & Discs



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Get more information about TYROLIT: www.tyrolit.co.uk



Premium grinding tools since 1919 www.tyrolit.com

BorazonT – A new era of abrasives

Horst Lach, managing director and CEO of LACH DIAMANT recently agreed to write an ongoing series of articles about the development of diamond and CBN tools and grinding wheels in modern industries. The occasion: LACH DIAMANT's 96th anniversary.

As a true industry veteran, it is a privilege to have this pioneer of technology share some insights from 55 years of professional experience in the diamond tool business.

Horst Lach remembers the beginnings:

It was 1969 when manufacturer General Electric offered small amounts of a new abrasive "Borazon" to the diamond tool industry. Unlike diamonds, the new abrasive was to be offered in grams and not per carat (1 carat = 0.2 grams). This meant that one gram would cost 5 US dollars, at the time more than the cost of a gram of gold. When the first samples arrived in the spring of 1969, the Hanover Trade Show was only weeks away. As in every year, LACH DIAMANT prepared to present its latest innovations at the prestigious event.



Quality diamond grinding wheels in resin and metal bond were already part of LACH DIAMANT's product portfolio since 1963. What could this new cubic crystalline boron nitride (CBN) "Borazon" be used for? General Electric recommended producing grinding wheels for steel grinding using the new material. Operational conditions were wet grinding at a cutting speed of 28 m/sec. But there was a catch: the limited sample of the test material was barely enough to produce a 200 x 10 mm wheel for a Jung surface grinding machine. But why do the surface grinding first? We could try the new CBN grain directly for tool grinding.

The first CBN grinding wheels for tool grinding were made: a 125 x 12.5 cup wheel and a cone cup grinding wheel 11V9 with 125 x 3. Our best diamond and grinding



wheel customer at the time, Simon machine manufacturer for steel and tool grinding machines in Neulsenburg, was chosen for the first test.

The first CBN grinding wheel in action

At first, we were very disappointed. It was neither possible to do wet grinding nor were we able to reach the required cutting speed of 28 m/sec. We only had a Type L15 steel grinding machine, with only 18 m/sec available for the cup wheel. "Let's try it anyway, since you're here", said the machine operator, and the test started with a clamped in piece of HSS turning steel. The grinding noise and sound was excellent and there was no "turning blue". It worked with the chosen machine conditions and a CBN volume concentration V120 (12 percent CBN by volume) of the grinding wheel, instead of V240 (24 percent CBN by volume) recommended by General Electric.

The world's first CBN grinding wheel for dry tool grinding was in action. Even today, I have to admit that I was totally thrilled. This new abrasive Borazon offered a new



Grinding Wheels & Discs

perspective for our relatively new portfolio of grinding wheels.

Metal covered synthetic diamond grits were available since 1966/67, therefore we were able to grind steel containing materials and carbide, e.g. steel templates with a carbide content of five percent. But hardened high-alloy steels with over 60 HRc - that was a result no one had anticipated at this time.



Because of this development, demonstrations on a Saacke universal grinding machine UW3 at the Hanover Trade Show and at IHA (a precursor of EMO) were nothing short of sensational. No one had seen HSS chips before until demonstrated in 1970 with the further advanced K-MX7 dry cutting wheel with "tressex" fillers and creep of up to 10 mm.

The CBN grinding wheel proves to be unstoppable

At LACH DIAMANT, the enthusiasm for "Borazon" was so great that we designated a whole area of our stand to the "Borazon" product line and large posters of Apollo's moon landing with the lunar module Eagle in July of 1969 were visible from far away. We had received special permission from NASA to use this image.

Even though a few exhibitors of the diamond tool industry were still sceptical in the 1970s, the success of CBN grinding wheels was unstoppable and CBN wheels soon replaced conventional grinding wheels. Due to the high brand awareness of LACH Borazon grinding wheels at the end of the 1970s, General Electric asked us to give up the name Borazon and use only "CBN" instead.

Already at the end of 1969, LACH DIAMANT was showcasing the entire program of potential applications, from tool grinding, surface grinding and external cylindrical grinding. Other resin, metal and electro-plated bonds were offered as well. To this day, at GrindTec 2018, CBN still offers more potential applications. Even



after almost 50 years with CBN, questions regarding applications and machine specifications demonstrate that there are many more future opportunities to utilize the second hardest grinding crystal after diamonds for time and cost savings and conservation of energy and the environment.

LACH DIAMANT's latest innovation will surprise many GrindTec visitors in Augsburg: Metal-bond CBN precision grinding wheels for deep grinding of complex Evolvent profiles.

LACH DIAMANT Jakob Lach GmbH & Co. KG Tel: 0049 6181 103822 Email: office@lach-diamant.de www.lach-diamant.de



Is your grinding filtration and extraction up to scratch?

Identifying and maintaining the best type of extraction and filtration for both wet and dry grinding applications can bring a range of business benefits. These include cost-savings through increased coolant life, improved surface finish and reduced production down-time. Most importantly of all though is the benefits it can bring to employee health.

CoSHH (Control of Substances Hazardous to Health) regulations require all employers to use and maintain effective control measures to protect employees from exposure to hazardous substances - a subject oil mist extraction specialist Filtermist has extensive experience in. Read on to hear tips from some of Filtermist's extended team on the best way to ensure your operatives are working in a safe and productive environment.

Flatbed filter media

The swarf and sludge produced in grinding will contain metal fragments from the material being machined, as well as particles from the grinding wheel, general dirt and debris.

Coolant containing swarf can easily pool on the surface of the filter media if the flatbed system isn't loaded with a suitable media for that particular coolant. This can result in bypass and tearing, meaning the machine tool will need to be stopped and cleaned more regularly, which can be time-consuming for the machine operator as Grant Tyrer, product manager at Filtermist division Direct Filtration, explains;

"Viscose media is widely used for filtering coolant used in grinding machines, but it's not always the most effective. The type of coolant varies in viscosity meaning that



some of our stronger/coarser grade materials can often be more suitable as they have greater fluid penetration characteristics letting the coolant through more easily than finer grade media.

"A number of our customers who have switched to a non-woven filter roll with a higher tensile strength have reported far less production down-time, and increased coolant life meaning they've saved money by reducing the frequency of waste disposal and coolant purchase."

Whilst tearing can be a frustrating issue, a more harmful occurrence is filter bypass. This happens when the contaminated coolant cannot penetrate the filter media. Fluid will always take the path of least resistance and can at times simply pass over the sides of the filter media and into the coolant tank. This unfiltered coolant is then re-used in the machine tool which can impair the quality of both the tool and the components being produced and impact on the surface finish.

"Even the smaller particles can cause an issue," explains Grant. "Quite often a flatbed filter media isn't enough to remove particles invisible to the naked eye. In this instance, adding a downstream polishing filter to the filtration system may be all that's needed. We come across this problem quite frequently, but find that customers don't always realise that we can offer a solution to this issue."

Fluid management

The value of responsible fluid management is well recognised, for both environmental and safety reasons, as well as from an operations and financial perspective. A number of lubricant specialists offer fluid management as a value-added service for customers. This can include identifying the best type of coolant for specific applications to reduce usage and waste, as well as recommending equipment which will deliver efficient coolant efficiently and help to extend coolant life.

Filtermist works with a number of fluid suppliers including Houghton International and Fluid Solutions to ensure effective extraction and filtration is a key offering of their wider fluid management programs.

Tramp oil skimmers

Tramp oil skimmers are designed to remove the tramp oil from the surface of the coolant sump. If left to accumulate on the surface of the coolant, tramp oil can lead to a build-up of bacteria, which affects the quality of the coolant and poses a health risk to machine operators.



Coolant mist extraction

"Filtermist offers a number of options to ensure coolant mist is effectively removed from the atmosphere in workshops that use both enclosed and open grinding machines," comments Filtermist director of sales Stuart Plimmer. "These include Filtermist oil mist collectors and filters from our sister company Absolent AB. The recommended system will depend on the nature of the application. We approach every requirement on an individual basis to ensure we provide the most effective solution for each customer."

Filtermist pre-filters and afterfilters

Pre-filters and afterfilters offer additional filtration stages to ensure as much particulate as possible is removed from the air.

The cyclone pre-filter is specifically designed to collect swarf before it enters the centrifugal filter. The system is attached to the inlet of the Filtermist unit and the contaminated air passes through it. The low-pressure area within the separator encourages the heavier particles to fall to its base where they can be easily removed.

Filtermist also offers the CSX low level stand which includes an inbuilt preseparator for more demanding grinding applications.

In some applications, a single filter fitted to the grinding machine will be more than adequate, but others may require multiple filters connected to machines in cell-based production areas, as in a Filtermist installation at Boneham & Turner.



Dry grinding

Dust and fume that arises from using grinding wheels in dry applications also needs to be effectively removed from the work area to ensure it doesn't pose a hazard to health.

Kevin Hood, sales director at Filtermist owned Multi Fan Systems, elaborates: "As with wet grinding, the nature of specific applications will dictate the best extraction system. Sometimes individual filters offer the best solution. Alternatively, the dust and fume from grinding operations can be captured as part of a centralised extraction system designed to remove a range of contaminants from workshop air.

"If a central system is installed, extraction points should be fitted as near to the operation as possible and operators should be trained on the importance of ensuring the extraction hood position is maintained."

As well as extraction equipment from sister company Absolent AB, Filtermist also supplies UK manufactured industrial dust collectors from subsidiary company Dustcheck Ltd. Dustcheck was founded in 1978 and has since established a reputation as a leading provider of effective dust extraction equipment used in a wide range of applications including grinding, shot-blasting and powder coating.



Air Monitoring and LEV Testing

Once an LEV (Local Exhaust Ventilation) system has been installed, it is a legal requirement that it is tested by a competent person at least once every 14 months.

"Despite widespread communication campaigns about the importance of regular LEV Testing, we still encounter customers who don't realise their legal obligations," says Matt Wall, one of Filtermist's LEV engineers. "Installing an LEV system is all very well, but if it is not tested regularly then any performance issues may not be flagged until it's too late. Employers are responsible for ensuring the air in their facility is safe to breathe at all times so regular testing is vital."

More details can be found on the HSE website: www.hse.gov.uk/lev/

"Dealing with a supplier that offers all permutations of system and supporting services will ensure that the customer's needs are dealt with most effectively," concludes Stuart Plimmer. "We work with a wide range of customers that use grinding machines to ensure they are benefitting from cleaner, safer, more productive workshops."

Find out more about the products and services mentioned above by following these links: **directfiltration.co.uk**, **multifansystems.co.uk**, **dustcheck.com**, or contact:

Filtermist International Ltd Tel: 01952 290500 Email: sales@filtermist.com www.filtermist.com



FILTRATION

Filtration of coolants and lubricants: there's more to it than meets the eye

To manufacture precision tools, tool manufacturers must be technically up-to-date and optimally coordinate all parameters involved in the process, such as edge preparation along with state-of-the-art grinding, measurement, and coating technologies. Fine filtration of cooling lubricants also plays an important role within the overall manufacturing process. On one hand, clean cooling lubricants have a significant influence on the quality of ground tools and, on the other hand, finely filtered coolants offer extended service life which contributes to considerable cost savings in production.

Grinding oils are contaminated by metal abrasion particles, dirt, and decomposition products and can be a major risk factor in the grinding process. If these lubricants are not filtered comprehensively, they need to be replaced in very short intervals. This becomes even more important as manufacturing process development progresses and quality demands increase. Whether dealing with conventional, synthetic or water-miscible coolants, the area of cooling lubricants has become a sensitive, highly technical topic in modern metal processing. The choice of the correct coolant depends on the respective process factors.

Thanks to special additive packages, tool manufacturers can choose a lubricant which is optimised to its machining application.

Steffen Strobel, technical sales manager for fine filtration manufacturer VOMAT from Treuen, Germany states: "In today's modern tool production, the filtration of high-performance coolants represents more than just filtering a necessary expedient. Anyone using innovative grinding oils in his grinding process cannot compromise on filtration. The decision for the right filtration system for grinding carbide and high-speed steels (HSS) is an important prerequisite for the quality and efficiency of the entire value chain. Modern microfiltration technology lets modern, highly-advanced cooling lubricants shine.

Modern filtration technology

Thanks to their special design features, VOMAT filtration systems are optimally set up to reliably and cost-effectively filter even the latest generations of coolants. Full-flow filtration ensures a 100 percent separation of dirty and clean oil thanks to the use of high-performance pre-coat filters. The system provides permanently clean oil in NAS 7 quality (3-5 μ m particle size) to the grinding process.

Another advantage is the tremendous energy efficiency of VOMAT technology: VOMAT systems filter and backwash according to need. This means that the backwash cycle is only initiated depending on the degree of contamination of the filter elements.

Steffen Strobel continues: "The optimal filtration of the coolant in conjunction with need-based filter cleaning has many advantages for the tool manufacturer. The system automatically adjusts to varying machining volumes and adapts perfectly to the production



With "aquatec", the filtration specialist VOMAT provides a microfiltration-system especially for the filtration of synthetic, water-miscible coolants

process. This means that less electricity or energy is consumed. Also, the life of the individual filter elements increases and the coolant can remain longer in the system. In addition, VOMAT systems are designed to transfer as little heat as possible to the oil, which in turn requires less cooling."

Since each tool grinder has its own workflow and production processes, VOMAT offers a wide range of possibilities based on their standard FA machine series to integrate filtration technology optimally to the customer's needs. The VOMAT machine range covers the gamut from small individual systems to large industrial central systems.

Steffen Strobel concludes: "We analyse the exact requirements of every respective company in order to set up the appropriate system. In return, our long-standing customers often involve us early in the planning stage, when innovations or building modifications are implemented in their company. Even companies that require frequent changes are on the safe side with VOMAT systems, because our technology is flexible and allows for growth with the availability of a wide range of optional add-on modules."

Vomat UK Distributor: Oelheld UK Tel: 01745 814777 Email: sales@oelheldgroup.co.uk www.oelheldgroup.co.uk

FILTRATION

The filtration expert

Losma S.p.A is a leader in design and installation of filtration systems for air and coolants, and offers the following solutions in its wide range of products:

Argos cartridge filtration unit

Argos units are designed for depuration of oil mists, vapours and smokes generated during machining processes. Argos is available in three sizes with a flowrate from 3,000 to 15,000 m³/h, with different filtration efficiency combination up to 99.97 percent with HEPA filters. This unit is conceived for big machine tools or centralised applications.



Argos filtration process has three phases:

Air enters in a calming chamber, which can be supplied also with a pre-blasting system called "Twist", which further facilitates the aggregation of the finer particles by means of a forced centrifugal effect.

Subsequently, the air passes through two separate and reusable filtration stages, a PVC drop separator and metallic G2 filter.

The next area consists of a chamber which houses the filter elements, cartridges with folds, with a high filtration surface which withholds the finer impurities.

Upon request, Argos can also be supplied with an absolute filter H13, which allows a filtration efficiency of 99.97 percent, following the regulation EN 1822. Re-condensed oil mist particles are collected in a large tank, which includes an external visual level and a pump to automatically remove the liquid.

This filtration unit has purposely been conceived for the industrial sector and its important features lie in its sturdiness, reliability and simplicity in conduction and maintenance. The integrated manometer allows to control the obstruction state of filtering elements. Upon request, the system can be supplied with the "LED Up" system: a LED stripe indicating the cartridge state with the combination of three colors. Access to the filtration chamber is possible through a hinged door, the horizontal positioning of the cartridges allows quick and easy access and maintenance.

Spring Compact: self-cleaning drum filter

This is a self-cleaning drum filtration system for coolants, using non-consumable media. Part of the Spring series, it differentiates from other depurators for using a metallic net as permanent filtering media. Net efficiency is customisable and can be regenerated thanks to the automatic cleaning system called Autoclean, to reduce maintenance and waste disposal costs.



Spring Compact can manage flowrates ranging from 100 to 5,000 l/min of neat oil or emulsion, filtering just the amount of coolant requested by the machine tool. The filtration process is very simple: the liquid enters into the tank and passes through the drum, which is covered by a metallic net. At the beginning of the process the net is clean, pollutant particles collect on the drum. As the filter net gradually gets dirty, the liquid level increases. When the coolant reaches the maximum internal level allowed, a self-cleaning cycle is started automatically and the drum rotates. At the end of this phase, the coolant level is lowered and the filtration cycle begins again.

Spring Compact is different from other coolant filtration systems because the clean tank is welded on the filter body. From here it goes straight back to machine tool thanks to a pumping system, thus eliminating any mud deposit.

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21st century honing with 21st century super abrasives

In the pre-dawn light of the 4th Industrial revolution, it seems unbelievable that honing is still done 'hands-on', but it's not so long since honing engineers would hold up their hands to show missing fingers, to demonstrate how they mastered their craft. In the modern, legislated world, that's clearly unacceptable, but occasionally still done. So, when presented with the opportunities to make safe the production of components for a wealth of different industries Delapena was only too pleased to introduce the customer to a machine designed with failsafe, interlocking guarding to remove hands from the work area. This means that operators would no longer be anywhere near the spindle when in motion and no longer requires the component to be guided by hand onto the honing mandrel. The operation becomes totally hands free; happening at the push of a button, well behind the auto-stop doors.

However, simply making an accurately controlled CNC honing machine is only part of the solution. The complete solution includes super abrasives honing stones and precision fixtures and it is a mix of all these that provides the customer with a repeatable, stable process. Although Delapena has been in the honing business for 90 years it was missing the expertise of super abrasive hone manufacture. Delapena had relied on third parties to supply honing abrasives for various applications that demanded specific abrasives to suit specific materials. The fact that it could not manufacture its own super abrasives honing stones was compromising the complete solution, according to Delapena managing director Martin Elliott.

In 2015, Delapena took the plunge and invested in a small R+D cell for the manufacture of super abrasives and within a matter of weeks developed its first range of honing bonds. The initial objective for the Delapena range of super abrasive honing bonds was to become self-sufficient and to be able to act quickly with spikes in customer demand. However, the uptake of the new offering soon became a bottleneck on the small-scale production facility, which prompted Delapena to take the plunge and invest in the latest state of the art



equipment. The new equipment was installed in late 2016 and was operational by January 1st 2017.

With all the enquiries for the super abrasives, 2017 was a bit of a blur and by the end of the year, Delapena was supplying its products into six automotive engine plants around the world. One of the reasons for the success was Delapena' s ability to manufacture new products within 7 days, as well as being able to offer consignment stocking of abrasives for the larger users with unpredictable demands.

The metal bond super abrasives market was the first target for Delapena. More recently, the company has launched vitrified super abrasives and cork abrasives to complement the range.



Metal Bond - ideal for most general honing applications







Cork Bond - ideal for plateau honing

What makes Delapena different? Due to market uncertainty in the UK with Brexit and what the future holds with regard to trade tariffs, there has been a move to reshore critical products. Delapena has been very active with OEM's in the automotive engine industry and now offers: average costs savings of 30 percent; the ability to replicate any honing bonds within seven days; two-week lead times; consignment stocking; protection from currency exchange rates.

Super abrasives and Industry 4.0

The key message coming from Delapena customers discussing the honing process and Industry 4.0 is to have a honing machine with a stable process that requires little or no operator intervention. Using standard vitrified bonded abrasives does not lend itself to industry 4.0, due to the wear factor of the abrasives. However, when using super abrasives with little wear characteristics, it allows the honing machine to run many hundreds of components before size adjustments are required, thus lending itself to a more autonomous process.

Delapena has now re-engineered the complete range of its honing machines to run with super abrasives and is now in the midst of implementing smart Industry 4.0 technology onto its honing machines. The first of these machines will be displayed on the Delapena stand at the MACH exhibition in April. It will come in the form of a new vertical honing machine that can be adapted to customer requirements.

Delapena Honing Ltd Tel: 01242 516341 Email: sales@delapena.co.uk www.delapena.co.uk

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ABOVE AND BEYOND HONING

Maximum transparency when honing

Machine controller for honing with convenient graphic support

Honing with micrometre accuracy – that's what KADIA Produktion GmbH does. The Nürtingen-based company equips its honing machines with components that represent everything that is technically feasible when it comes to precision and performance. In addition to the honing spindles with linear drives, high-precision measurement technology and reliable automation systems, this also includes the flexible machine controller HMC100.

Honing is a complex machining operation, with almost always two or more processes in succession, from pre-honing to finish-honing. The individual removal of material is monitored by measurements, sometimes to a tenth of a micrometer. That is a challenge for the machine controller. It must be able to map all honing procedures and individual processes. An optimised honing controller specifically designed for this purpose has for a long time not been available on the market. Machine manufacturers usually resorted or do still resort to a standard solution with the corresponding adaptations. An unsatisfactory situation, especially if like at KADIA, the focus is on high-precision honing.



The HMC100 control panel that has received the IF and Red Dot Design Awards, offers an oil-resistant and scratch-resistant 19" touchscreen. Numerical input is via a pop-up keypad



Operating the honing machine

The specialists at Nürtingen therefore decided to develop a controller themselves: the HMC100 (Honing Machine Control 100). "Above all, we wanted a Human Machine Interface (HMI) that optimally presents the manifold processes during honing", explains Henning Klein, managing director at KADIA, "All machine functions and all current working states and process qualities should be shown graphically. In short, we wanted a controller that offers the best possible transparency and ease-of-operation."

The hardware should also meet this requirement. The controller design engineers therefore opted for a control panel with a 19" touchscreen, a handy size for graphic presentations. In addition to this, the panel is absolutely suitable for all industrial purposes, i.e. oil-resistant, scratch-resistant and can be used while wearing gloves. Inside, there is also a powerful Intel-Core-i5 processor and a reliable SSD hard drive. The number of pushbuttons for external components was deliberately limited to the essential functions. The panel therefore looks tidy and user-friendly. Texts and numerical values can be entered via a pop-up keypad.

Graphics show more than columns of figures

The software relays all that is happening on the machine onto the screen via self-explanatory symbols. KADIA experts developed a unique picture language here. Machine operators, tool setters and service engineers played their part too. User navigation was also important to them; nested navigation structures and long click sequences were also avoided. The operation of the machine essentially focuses on two levels.

"The HMC100 is a key element of our Smart Dynamic honing technology. The motto of this concept is 'less complexity, more efficiency'", says Henning Klein. "The HMC100 implements this consistently by offering an intuitive operation of the machine. In doing so, we believe that we've set a new standard."

Even the less experienced operator can get to know his system more quickly and operating errors are reduced to a minimum. As a result, there are less machine downtimes and thus greater efficiency.

Independent experts confirm that the HMC100 has successfully created a coherent interface between man and machine. The control panel was awarded two of the most important design prizes: the IF Design Award and the Red Dot Design Award. Both awards go way beyond the optical aspects, as they also rate the ergonomics, innovation content and benefits of a technical product.

According to KADIA, roughly a hundred of these high-end controllers are now being used around the world. "As the requirements of our users continue to increase, we will also continue to enhance

HONING & BORE FINISHING

the range of functions of the HMC100", emphasises Henning Klein. Two interesting functional extensions were added last year: a statistics module and a scan function for the entire bore. The statistics module provides the database for process analyses in order to, for instance, promote continuous improvement processes (CIP). The module for example records the diameter values of several hundred workpieces on a control card. A histogram renders a numerical and graphical overview on the frequency distribution. The operator can then run a statistical process control. Any weak points in the process are immediately obvious.

New standards for quality assurance

The scan function for bores lifts quality assurance to an unprecedented level. With the pneumatic gauge probe, it is possible to record a multitude of diameter values per measuring path so that the controller can then display a continuous measurement value chart. By way of comparison, according to the previous standard, it is standard practice to use three to five gauging levels.

"Scanning the entire bore achieves a

E line Eco honing machine with the HMC100. KADIA now supplies every honing machine with the high-end controller

significantly higher level of reliability of the measurement. This is a world first, of which we are particularly proud", concludes Henning Klein."

KADIA Produktion GmbH + Co develops and manufactures honing and deburring machines and tools. Contract manufacturing has also been added to the portfolio. The company focuses on bores within the size range of 1 to approx. 60 mm. The main customers are from the automotive supplier industry, hydraulics industry, aviation and aerospace, tooling and machine construction. A central product area are honing solutions for injection systems for gasoline and diesel engines.

The successful company history of KADIA GmbH + Co dates back to 1959, when KADIA started its business by manufacturing honing tools. It wasn't long until, in 1969 the first honing machine was developed at KADIA and the company started to expand. Fast forward to 1981, when the company manufactured its first deburring machine. The company now has sites in Nürtingen, Homburg/Saar and Brighton (MI, USA) and is one of the leading specialists in honing and deburring technology. Employing 200 people, KADIA operates at national and international level for customers from the automotive industry and its suppliers around the world.

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Versatile abrasive tool for CNC machining decreases cycle and finishing time

Flexible hone provides fine surface finish for internal bores, along with edge breaking of undercuts and deburring of intersecting drilled holes

For contract part manufacturers, the ability to produce tight tolerance parts at a faster rate is the key to remaining profitable in a crowded, highly competitive market. To do this, machine shops constantly seek out creative ways to improve on overall cycle time, including speeding metal finishing operations.

Although machine shops may have some auxiliary finishing equipment, the primary focus is on the machining. As a result, many shops must send parts out for secondary finishing steps such as thermal deburring, tumbling and burnishing.

However, for job shops like Wolfram Manufacturing, a company that machines metal parts with complex geometries on 4- and 5-axis machines, sending out parts for secondary finishing not only adds to the cost but can impact quality and increase the time it takes to deliver the parts to customers.

"There's the additional time, not to mention the additional cost of having someone else do the work time. In the competitive environment today, we're often faced with short lead times from customers," says quality manager, Tim Urano. "Having to send parts to an outside vendor eats into our lead time and takes significant planning."

A better alternative for many machine shops, says Tim Urano, is to incorporate machine tools that can complete the finishing tasks within the machining process:

"Any time we can incorporate secondary operations right into the machining process, we save time, money, and reduce our work in progress."

In one example, Wolfram Manufacturing was charged with making a unique part for a sliding valve assembly with complex internal geometries that require a high surface finish on the internal bore and the elimination of any sharp edges from drilled holes.

Sliding valves, which are movable elements in a system, are used to direct the flow of a working fluid into the proper channel. The assembly is part of a larger product used in pressurised down-hole drilling tool.

To operate properly, the valves utilise O-rings that must be seated properly and maintain tight contact with the bore without getting cut by any sharp edges from intersecting holes or undercuts.

"The customer's primary concern is that

the O-ring seal is protected from being cut or damaged by any sharp edges or burrs," says Tim Urano. "It is one of the main reasons we use the Flex-Hone Tool."

The Flex-Hone, from Brush Research Manufacturing, is a highly specialised abrasive tool characterised by the small, abrasive globules that are permanently mounted to flexible filaments. Available in many sizes, abrasive types and grits, the tool is used for deburring, edge-blending, cross-hatching and removing cut, torn or folded metal.

"It's very easy to put the flexible hone in a toolholder, give it a simple toolpath cycle and let it run. With some of the other in-machine deburring tools it can take complex 4/5-axis paths to be effective," explains Tim Urano.

To satisfy the customer's requirements, Wolfram Manufacturing had to reliably remove burrs and sharp edges in cross-drilled holes and other difficult-to-access areas such as undercuts.

difficult-to-access areas such as undercuts. "The part has some undercuts and some

intersecting cross-holes so we use the tool to edge break and help blend the chamfers at the same time," says Tim Urano. "The hone is one of the only tools that can reach that edge. It doesn't alter the feature geometry, but it rounds it enough that it won't damage the O-ring."

A high surface finish is called out on the internal bores where the valve assembly actuates. As part of a multi-step process, Wolfram Manufacturing utilises a coarse grit Flex-Hone to smooth out any irregularities left during drilling and finishes the bore with a fine grit hone.

"Final finishing operations don't accommodate much variation, so they need the uniform surface preparation that the flexible hone provides," explains Tim Urano. "By using these tools, we can achieve more consistent results."

While FlexHones are often used with automated production equipment, they can also be used for offline deburring. If during post-processing or inspection any damage occurs to the bore finish, Wolfram can go



HONING & BORE FINISHING

back in with the hone and clean it up.

Tim Urano adds that Wolfram Manufacturing will continue to use the brush: "Whenever we see applications with intersecting holes, or particular surface finishing requirements in a bore, it's one of the first tools we will go to."

Brush Research is a privately-owned company located in Los Angeles, California. It has been in the business of solving difficult finishing problems with brushing technology since 1958.

BRM was one of the first companies to advocate the critical need for finer surface finishes to optimise performance. Concepts such as plateau finishing were

pioneered by its founder, Steve Rands and are now commonplace goals across many industries.

The Flex-Hone tool is the premium standard that all surface finishing tools are compared against. No other tool can as easily, quickly, and affordably create the microstructure finish necessary for maximum performance and life of your products.



All the tools manufactured by BRM are still made in the USA. The company has over 75 employees in Los Angeles, and provides products for hundreds of distributors across the country. Flex-Hone tools and industrial brushes are exported to over 50 countries around the world.

Brush Research believes in creating the best. That goes for its products and service.

As Steve Rands says: "Nothing improves until someone stops and questions an accepted assumption."

Brush Research Manufacturing Tel: 001 323 261 2193 Emainfo@brushresearch.com www.brushresearch.com

Engis Bore Finishing Technology



For more than 35 years Engis has been at the leading edge of single-pass bore finishing technology. Known throughout the world for its application expertise, total system solutions and superior after-sales service, Engis offers a full range of bore finishing machines from the very small to the very large, configured to suit your specification and your process.

Engis UK Ltd - The European division of Engis Corporation Tel +44 (0)1491 411117 Email: sales@engis.uk.com www.engis.uk.com



Engis technology and expertise delivers bore finishing solutions

Superabrasives specialist Engis UK, based in Henley on Thames, the European headquarters of Engis Corporation, offers honing and bore finishing technology, supplying solutions ranging from one-off electroplated grinding and honing tools to complete bore finishing machines, all supported by experienced local technical staff.

Engis, originally established in Chicago in 1938 as a trading company for quality assurance instrumentation, has become a truly global corporation, with facilities in Canada, Japan, Hong Kong, Singapore, China and Korea, as well as the USA and UK, serving customers in many industries including oil & gas, electronics, semi-conductor, medical devices, aerospace, automotive, defence, ceramics, mechanical valves and seals, foundries and mould and die.

The company has a worldwide reputation for its innovations in the use of diamond and CBN in flat lapping, honing, grinding and polishing applications, as well as developing fully configured, custom-designed finishing systems.

Complete range of bore finishing systems

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.

In addition to a range of bore finishing machines, the company also offers a full range of tooling, with options to fit onto standard machining centres, as well as accessories such as automation and gauging packages.

Engis single-pass bore finishing process

Traditional honing machines cannot match the benefits of Engis' single-pass bore finishing process, which uses fixed-size, but adjustable, bore finishing tools coated with diamond abrasive particles. These tools pass through the bore only once, removing a specific amount of material.



By using a series of progressively larger bore finishing tools, coated with progressively finer super-abrasive particles, this process enables extremely tight tolerances to be achieved.

Originally developed for cast iron applications, Engis advances now make single-pass bore finishing suitable for hard, soft and "gummy" metals and materials, including ceramic, steel, aluminium, bronze, brass and chrome.

MPM micro-bore finishing machine

Engis' MPM single-pass bore finishing machines handle small components with bore sizes from 1.4 mm to 10 mm in diameter. Machining small bores into small components presents significant production challenges, primarily due to the difficulty of ensuring the stability of both tool and component. To overcome this issue, the MPM has separate drives to each spindle, offering the ability to program the speed of the individual tools to optimise performance. In addition, torque feedback for each spindle monitors the tool performance, maximising accuracy and extending tool life.

SPM small precision machine series

These machines, which have been developed to provide a cost-effective solution for toolrooms running small to medium sized parts with IDs of 50 mm or less, are available in 4, 6, 8, and 10 spindle models and offer technical features, including a servo-fed column design, precision spindles, pneumatic counter balance on the head.

LPM large performance machine series

Designed for high-volume manufacturing applications, the LPM range, available in four, six and eight spindle variants, offers superb roundness, concentricity and finish, achieving extremely tight tolerances reliably and consistently in both standard and semi-blind bores, achieving a lower cost/hole due to extended tool life, with shorter cycle times, improved bore quality, fewer rejects and the need for less frequent part inspection.



FPM-3X 3-axis bore finishing system

The FPM-3X 3-axis single-pass bore finishing system addresses the challenge of aligning and finishing bores of large hydraulic valve bodies after stacking. The FPM-3X features full CNC controls with a Z-stroke of 750 mm, an X-stroke of 1,066 mm and a Y-stroke of 100 mm, with a slide base that can accommodate parts up to 1,350kg. An 8-13 pocket automatic tool changer allows the machine to complete bores from rough to finish without operator involvement.

Engis puts honing capability onto machining centres

Understanding that a dedicated bore

HONING & BORE FINISHING

finishing machine is not always a cost-effective answer, Engis has developed an innovative solution which replaces the highly skilled "black art" of honing and puts the process firmly into the range of standard, repeatable machining centre tasks, on standard vertical and horizontal CNC machining centres.

This tooling design overcomes the issues caused by lack of height within many machining centres and at the same time removes the need for floating toolholders and adaptors, enabling the tools to be held directly in the machining centre toolholders while still providing the required high geometric accuracy and finish.

Using this system, the first tool passes through the bore with a single in-and-out stroke and its place is then taken by the following



pre-set, single-pass tool. The number of tools used in any given application will vary depending on the amount of stock to be removed, the surface finish and geometry required and the material being machined.

This solution is suitable for many applications including particularly the

manufacture of hydraulic valves, aerospace and F1 components, as well as opening up further opportunities to companies bringing low-volume bore finishing tasks in-house.

Each of the Engis pre-set single-pass bore finishing tools is coated in a single layer of diamond, which is permanently plated onto the tool, creating faster cutting/stock removal rates and meaning that tool sizes can be held for long periods without adjustment.

Advanced bore finish tooling

Engis' bore finishing tooling solutions include through-bore, blind-bore, dual diameter finishing, seat finishing and internal float design tools. The company is finding that single-pass bore finishing technology is increasingly replacing conventional honing for finishing internal diameter bores, having proved itself to be cost-effective for many bore finishing applications. In standard blind and semi-blind bores, Engis diamond-plated and super abrasive finishing tools are capable of achieving bore geometries to within 0.5 µm. Furthermore, because these tools use plated diamonds, they cut cooler, maintaining their size and achieving extremely long tool life, thus reducing the cost per finished item.

Both at the company's dedicated Bore Finishing Process Development Laboratories at its HQ in Wheeling, Illinois and at its facility in Henley on Thames, engineers are constantly working to improve bore finishing processes. For example, tooling packages are tested and refined for process optimisation, while tool holders and fixturing packages are tested and prototype parts run at various cycle rates.

Engis UK bore finishing laboratory

One of the benefits that Engis UK offers its customers is its well-equipped bore finishing laboratory which provides technical support and expertise in developing bore geometries for applications in a wide variety of sectors including medical, pharmaceutical and automotive, using materials such as ceramics, steels, iron and aluminium. Bore geometries of between 2 mm and



75 mm diameter can be developed and tested in the UK, while for larger bores up to 200 mm diameter, work can be carried out at the company's laboratories in the USA.

The UK laboratory is equipped with a range of bore finishing capabilities supported by leading-edge metrology equipment which can measure the cylindricity, roundness and straightness of bores to an accuracy of $0.1 \, \mu m$.

The laboratory demonstrates Engis UK's belief in the importance of customers and suppliers working closely together to develop optimum solutions to manufacturing requirements, as each process, including stock removal rates, bore geometry requirements and surface finish, is studied, step-by-step, to ensure customers can achieve all their engineering objectives.

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Ellesco delivers speed and quality to North West Polishing

Founded in Oldham in 1996 by managing director Andrew Marston, North West Polishing Ltd is a provider of long product metal finishing. Currently celebrating its 21st anniversary, the company has grown to be one of the most trusted independent metal finishers within the UK. Having 'come of age', North West Polishing continues its remarkable progress.

Prompted by ever increasing demand from both its loyal client base and from new customers, the company is currently involved in further expanding its production facility and investing in new, highly efficient plant. As a major element in its latest expansion phase, North West Polishing purchased an advanced VG Machines, T-300-3K polishing machine from Ellesco Ltd.

Andrew Marston says: "Our customers are of prime importance to all at North West



Polishing. We therefore provide each of them with first-class polishing, performed by highly-skilled craftsman on world class machinery. Having established an excellent reputation for the quality of our output and for providing value for money, demand for our services continues to grow. In addition to currently being involved in expanding our factory, to help satisfy these increasing demands we have started to make a series of investments in new plant. Central to our plans was the purchase of a high-quality, fast throughput polishing machine.

"Just as we seek to build lasting technical and commercial partnerships with our valued customers, we also look to establish on-going relationships with suppliers who are not only able to provide the plant and consumable items that we need but who can also offer excellent levels of service and technical back-up.

"Having previously purchased polishing machines from other suppliers with somewhat mixed results, we were delighted with the performance of our first polishing machine from Ellesco Ltd and the excellent service we received. We have established what has become an enduring relationship with the company.

"After recently explaining our latest polishing machine needs to the owner of Ellesco, Vincent Simonis, we came to the joint conclusion that an advanced VG MachinesT-300-3K polishing machine was the ideal machine to satisfy our challenging requirements. Following a trouble-free installation and operator training, our new VG Machines T-300-3K polishing machine is now enabling us to process much greater quantities of products in a range of high-quality finishes. The impressive speed



of the machine ensures that we are able to deliver within the strict time frames required by our customers whilst not compromising the high specification finishes our clients demand."

The highly efficient VG Machines T-300-3K supplied by Ellesco uses three abrasive belt heads fitted with 300 mm belts, each driven by individual 7.5 kW heavy duty motors. When swapping from one abrasive belt grade to another, the machine's fast belt change feature ensures that minimum production time is lost.

The robust machine boasts pneumatic floating linishing heads that automatically compensate to ensure consistent pressure is applied to long, non-uniform workpieces. In addition, the T-300-3K provides powered adjustment for different thicknesses of bar



Polishing & Lapping

and box-section products, whilst automatic belt tension removes unwanted oscillations.

The T-300-3K's through-feed conveyor, speed adjustment allows slow throughput for demanding applications such as heavy scale removal and pronounced extruder draw lines, through to fast throughput speeds for fine finishing and for jobs where minimal heat generation is a requirement. North West Polishing's T-300-3K was supplied with a fixed machine table height to match the company's existing in-feed and out-feed roller tables.

With more than 40 years' experience, ISO9001:2015 registered Ellesco Ltd is one of the longest established UK companies involved in supplying polishing, deburring and finishing machinery to all sectors of industry. Unlike some other businesses that supply the nearest match to a customer's requirements from a limited product range, thanks to Ellesco's access to a wide range of leading brands, it is able to deliver solutions that precisely correspond to customers' specific needs. Ellesco's comprehensive polishing, deburring and finishing range includes machines from leading German, Dutch, Spanish, Belgian and USA suppliers.

Vincent Simonis concludes: "All at Ellesco

work hard to provide the most suitable machinery and consumables for the job in hand and to deliver the best possible service to our clients, all backed-up by industry leading levels of support and training from our own engineering technicians.

"As with our recent sale to North West Polishing, prior to purchase we consult closely with all potential customers to ensure that they receive the most technically capable and cost-effective solution to their finishing needs. To help potential customers in their purchasing decisions, we are able to prove the capabilities of each of our machines in our own demonstration area, or to demonstrate similar machinery at our customers' premises or in the equipment manufacturer's factory.

"Our attention to customer care means that we deliver, install and perform staff training on all of our machines. We also assist in keeping machines in first class condition, either alongside customers own service personnel or by using our own technicians.

"As the term polishing covers a wide range of finishes, from the ground "dull polish" of the stainless-steel industry through to the very high gloss finishes



demanded by manufacturers of domestic fittings, we were happy to work closely with Andy Marston of North West Polishing in order to fully understand the company's precise needs. This cooperation ensured that the most suitable, cost-effective machine was delivered."

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Perfect surface finishing WEBER GD grinding roller



Perfect rounding and surface quality WEBER DR planetary head



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First to the finish

Based in Salisbury, Wiltshire, Moleroda Finishing Systems has been successfully trading since 1981 and has supported UK and global customers to achieve the desired finish required in their industry.

Sales director Lizzie Houghton recently appointed former sales manager at Cromwell Group Kevin Brown to the team as global head of sales, to drive the business forward.

Moleroda has invested in its own production factory to allow it to offer great control quality. The internal sales team is extremely qualified and ready to help with your questions. With over 50 years' experience between them, the factory team facilitates the designing of bespoke products to suit customers' needs. The abrasive range stretches from industry roughing/grinding to 0.25 micron finishing and polishing grades.

Moleroda is now the UK agent for Micro-Mesh, manufactured in the United States. This product is sweeping the UK and comes in various forms to suit your finishing/deburring or polishing needs, whether it be on aluminium, stainless steels or precious metals, whilst also having the grades to finish plastic, acrylics, glass and corian to a showroom finish. Its main benefits are its flexibility and the non-clogging innovative design to offer second to none finishing.

The Micro-Mesh kits, which have been approved by Boeing and McDonnell Douglas and also have UK military approvals, are the choice of professionals in these industries.

The company has also had great success this year with the new Eneska 600 Micro Motor machine, which has been replacing the noisy, heavy Dremel style polish/deburr machines. Compared to hand- held devices of the past, this is powerful, quiet, precise and reliable. Demonstrations in Southern aerospace manufacturers have proved to be a great success, with quantity orders placed. The new Eneska 600 pack is currently being demonstrated across the UK.

Moleroda prides itself on supporting its customers and offers a fantastic sales and after-sales experience, which has kept the



name and brand at the forefront of every organisation where quality of finish is important to them and their customers. Moleroda supplies consumables to Tier One companies within aerospace, F1, defence and other high reliability industries.

Moleroda Finishing Systems Ltd Tel: 01722 711988 Email: info@moleroda.com www.moleroda.com

Lapping and polishing expertise

A real specialist in all polishing technologies, LAMPLAN offer its customers scientific competence, experience technical know-how to work with them on an ongoing finer control of their lapping and polishing problematics. From research and development to the implementation of recommended high-performance abrasive solutions, LAMPLAN's teams deploy each day worldwide an efficient and friendly process with respect to environmental problematics.

Lapping intervenes for the finish of your mechanical components or the preparation of a polishing operation. Lapping allows you



to obtain a surface condition with a defined roughness and/or inherent flatness. This operation can take place during the production of parts or within the maintenance operations, for example mechanical seals for valves.

The many materials for the lapping process include: 100C6 steel, treated steel, bronze, silicon carbide, cobalt chromium, brass, gold, stellite, stainless steel, ceramic, ferrite and Hastelloy.

LAMPLAN's test laboratory has one of the most important knowledge bases on the lapping of various materials. This database is permanently enhanced by the performance of tests on new materials and studies conducted to attain new technical or quality requirements. If you looking for a solution to lap a specific material, contact LAMPLAN.

Flat polishing

Flat polishing allows you to obtain a finish (brightness, mirror polished) of the flat surfaces of your components to respond to your technical and aspect objectives. The obtained surface condition is



characterised by a low roughness (0.01 Ra), a brightness which is visually and/or microscopically checked, a flash.

Application areas include: watchmaking, jewellery polishing (finish of moving parts and decoration, etc.); optoelectronic polishing; polishing of optical fibres, wafers and lenses; medical polishing, for example polishing of prostheses and instrumentation; finish of mechanical parts, for example connectors, automobile, aircraft etc.

LAMPLAN Industries Ltd Tel: 01732 824829 Email: sales@lamplan.co.uk www.lamplan.co.uk

Lapping, polishing and cleaning for aerospace

With the need for ever harder materials, the challenge of achieving precise geometries and finishes has become ever more demanding, requiring the most precise abrasives. Kemet International Ltd's diamond lapping and polishing systems are widely used throughout the aircraft and aerospace industries in OEM and maintenance as they offer the most efficient



and reliable method of producing precision flat, polished surfaces.

Kemet's ISO 9001: 2015 assured diamond abrasives enable precision lapping of aircraft components to be carried out in production and service environments, each slurry or compound being a specific concentration of graded diamond powder blended with a chemical carrier to achieve

optimum stock removal and surface finish, ease of cleaning, temperature resistance and lubricity.

A wide range of flat lapping machines enable lapping of hydraulic parts, engine seals and bearings and metal-to-metal faced seals on pumps and valves, while simply adding a Kemet composite annular grooved plate offers precise shoulder lapping of gear faces. Landing gear components can also be effectively lapped with diamond and the intricate internal faces/diameters, along with other aviation subassemblies, polished using diamond compound with Kemet's portable hand lap kits and Helilaps. Pump, valve and engine seals up to 300 mm diameters in a variety of materials, for example tungsten carbide, Stellite, ceramic, silicon carbide, carbon, brass, can all be lapped and polished, some to a mirror finish where required, under production conditions using diamond to a flatness of one light band (<0.0003 mm).

Where component cleanliness is also critical, the same level of precision can be achieved with Kemet's range of ultrasonic cleaning fluids and cleaners. From benchtop to stand alone industrial tanks to fully automated, multiple tanks, Kemet can provide cleaning systems to meet even the most stringent requirements.

Free trials to establish the optimum lapping, polishing and cleaning process are available. Visit Kemet on Stand H6-650 at MACH 2018.

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Precision Lapping | Polishing | Cleaning | Materialography

...in the sky with diamonds

Widely used throughout aerospace industries in OEM and maintenance, our diamond lapping and polishing systems offer efficient and reliable production of precise geometries and precision flat, polished surfaces, while our range of ultrasonic cleaning fluids and cleaners enable the most stringent cleanliness requirements to be achieved.

ISO assured diamond abrasives, and a comprehensive range of lapping machines, enable precision lapping of aircraft components: hydraulic parts, engine seals/bearings, metal-to-metal faced seals on pumps and valves, gear faces, landing gear components and other aviation sub-assemblies,

> Free trials are available to establish optimum lapping, polishing and cleaning processes.



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Extreme conditions call for perfect results

OTEC machine technology opens up new possibilities for the finishing of components in the aerospace industry and provides an automated process for high quality surfaces. These are absolutely crucial in this industry in particular. Components used in the aerospace industry must be made to withstand extreme environmental conditions. In modern gas and aircraft turbines, for example, combustion temperatures of well over 1,000°C are common. This places very stringent requirements on the surfaces and materials used, as well as on the manufacturing and finishing processes.

In the highly sensitive field of aerospace, safety and reliability are of the utmost importance in all processing stages. Due to the stringent demands placed on quality, complex components are often finished manually. The disadvantages of this are not only the high costs but above all, the fluctuations in the results of the finishing processes. OTEC machines give reproducible results with the highest surface quality in the shortest possible processing times, revolutionising the surface finishing of components for the aerospace industry. For the first time ever, perfect machine finishing of surfaces is a reality, with high-precision results and a more consistent quality than can be achieved by hand.

OTEC's stream finishing machine can deburr, round and smooth turbine blades in a single processing stage. After they have been manufactured, turbine blades exhibit considerable initial surface roughness and excessively sharp edges and must therefore subjected to high-precision surface finishing before they can be used in an aircraft or for



generating electricity. This entails both smoothing the surface and rounding the edges. Using OTEC machines, the surface is homogeneously smoothed, generally to Ra < 0.4 μ m and often to less than Ra 0.25 μ m. Here, it is especially important to ensure that the shape of the blade is not damaged.

Furthermore, the edges can be rounded to a predefined dimension without excessively rounding the corners of the blades. The process times are between two and 30 minutes. Several workpieces can be clamped in the machine at the same time, which ensures a very high throughput. The workpieces are lowered into a rotating



container filled with a grinding or polishing medium. The actual working motion is generated by the flow of abrasive medium surrounding the workpiece, which also rotates independently.

In terms of processing speed and precision, OTEC machines also represent a major advance in the finishing of gear wheels. With gear wheels, the objective it is often to smooth the tooth flanks or round the tooth tip. Finished gear wheels have considerably lower friction values. Gear wheels finished in OTEC machines have a lower Rpk value and therefore lower friction, which in turn increases energy efficiency. A further benefit is that oil change intervals are much longer because there is less abrasion of the metal.

The tremendous finishing forces, extremely short processing times and absolutely reliable processes make stream finishing machines from OTEC perfect for use in the aerospace industry. This machine type is also suitable for selectively smoothing the surfaces of blisks.

Fully integrated into automobile manufacturing

OTEC's stream finishing and pulse finishing units have been specially tailored to the requirement profile of assembly line

Deburring

production in the automobile industry or high-tech tool industry, in order to meet the high standards of process reliability, speed and processing quality demanded by large-scale series production.

OTEC developed the Type SF 4/140 stream finishing machine with pulse drive especially for full integration into the production lines of large-scale automotive series production plants. This system type enables our customers to deburr, round and smooth camshafts simultaneously and in a very short time.

With the aid of a central handling cell made by partner Felsomat, two Type SF4/140 stream finishing units are loaded and unloaded automatically. The loading and unloading is carried out by way of automatic lift doors at the stream finishing machines. The transfer from the system to the main portal is made possible via a separate conveyor belt integrated into the handling cell. This plant layout enables eight workpieces to be processed at the same time, giving a cycle time of 17 seconds. The complete unit linked in this way measures approx. 6.5 x 3.5 x 3.1 m. Control panels fitted to the side of the support arm make the system easy to operate. Of course, individual adjustments can be made to suit the customer's wishes and requirements.

The workpieces are clamped by means of collet expanding mandrels. The rotating workpiece is finished by being immersed in a stream of polishing medium. The stream is generated by a rotating process drum. After finishing, the workpieces are blasted clean and returned to the customer's process by means of a separate conveyer system. In this way, 3,500 – 4,000 workpieces can be finished daily.

This results in the smoothing of the surface from Rz 2.5 µm to less than 1 µm and Rpk value to less than 0.1 µm.

The company developed the pulse finishing process specially for assembly line series production in the automotive supplier





industry. In this process, the workpiece is clamped to a spindle and lowered into a drum containing an especially fine-grain abrasive medium. The drum rotates around its own axis at speeds of up to 60 rpm. The spindle holding the workpiece oscillates at about 2,000 rpm, i.e. it accelerates to 2,000 rpm within one second, then decelerates and accelerates again to 2,000 rpm. and so on.

In addition, the spindle can be swivelled through up to 25 degrees so that the stream of abrasive medium to the workpiece can be adapted to the specific geometry of the workpiece.

"The processing time for reducing the roughness value from, for example, 0.2 μ m to 0.1 μ m, is less than a minute", says OTEC CEO Helmut Gegenheimer, explaining the strengths of this machine concept. Depending on the number of spindles, the cycle time is from 20 to 25 seconds.

With the finishing centre, OTEC determines the exact processing time, the best process media and the right machine parameters for each workpiece.

From consultation to series production In order to best fulfil the requirements of each individual application, it is essential to determine the ideal combination of all

relevant process parameters. This includes amongst other things the choice of process, the composition of the processing media, the speed of rotation, the processing time and, in the case of drag finishing, the clamping angle.

OTEC supplies machines in a variety of sizes, from bench top units to fullyautomatic plants. As for the choice of the right medium, potential customers are invited to have a sample of their product processed free of charge at OTEC's finishing centre. This service is available to customers all over the world. Systems for separating the finished workpieces from the processing medium and for reprocessing the water used complete the OTEC range of products.

OTEC is a medium-sized manufacturer of drag finishing, disc finishing and stream finishing machines. Founded by Helmut Gegenheimer in 1996, the company has steadily established itself on the market by developing innovative new machine concepts and numerous patented processes.

UK Agent: Fintek Tel: 01706 221279 Email: info@fintek.co.uk www.fintek.co.uk

Clean and burr-free with high energy efficiency

Weber Ultrasonics Innovation-Lab – a new solution for deburring

Ever stricter demands for precision, process stability and profitability in component manufacturing also require new processes when it comes to deburring. Ultrasonic deburring is a development of the Innovation Lab at Weber Ultrasonics AG. The process employs specially developed ultrasonic components to allow targeted and reliable removal of burrs on internal and external component surfaces, such as die-cast brass, aluminium and zinc parts, as well as injection-moulded plastic parts. In comparison with high-pressure waterjets, the new process excels through its significantly lower energy consumption, as well as gentler handling.

Just like component cleaning, deburring is a key prerequisite for achieving a high level of quality and functionality in downstream processes and the products themselves. Conventional deburring processes, such as high-pressure waterjets, surface finish grinding, chemical and electrochemical deburring, brushing or manual deburring, are characterised by high costs, untargeted material removal, a high environmental burden and the risk of secondary burrs. With ultrasonic deburring, the Innovation Lab at Weber Ultrasonics AG, a technological leader in the field of ultrasonic components and solutions, is driving a new process that eliminates these disadvantages. Here, the company combines expertise from the fields of ultrasonic cleaning and ultrasonic welding, the latter of which in particular concerns the development and manufacture of the deburring tool – the sonotrode.

Deburring with ultrasound

The deburring technology, developed and verified in collaboration with the Fraunhofer Institute for Manufacturing Engineering and Automation (IPA), is based on the physical effect of cavitation and a flow. A generator, whose frequency and amplitude have been matched to the deburring requirements, generates sound waves during this process. These are then applied to the workpiece using the specially developed sonotrode in a tank of liquid without chemical additives. This subjects the workpiece to intensive



By adjusting amplitude, power output and the duration of ultrasound application, as well as through the design, distance and position of the sonotrode relative to the workpiece, the process can be adapted to a wide range of deburring tasks

cavitation for a brief period. As the local cavitation bubbles implode, high forces and a powerful flow are generated in the liquid. This in turn allows the targeted and gentle removal of burrs at specific spots or across entire areas without thermal stress or the risk of creating secondary burrs.

Ultrasonic deburring also impresses in terms of energy efficiency. In fact, it only requires around one to two percent of the energy of a typical high-pressure waterjet process. In addition, deburring is performed more gently and with less material removal. By adjusting amplitude, power output and the duration of ultrasound application, as well as the distance and position of the sonotrode relative to the workpiece, the process can be adapted to a wide range of deburring tasks. The ability to match the sonotrode very precisely to the component also contributes to optimal machining results.



The deburring effect is based on cavitation and a flow. In comparison with high-pressure water jets, the ultrasonic deburring process excels through its significantly lower energy consumption, as well as gentler handling
Deburring

Both internal and external surfaces of metal and plastic parts can be machined Excellent results have been achieved in contactless removal of both internal and external burrs on die-cast aluminium and zinc parts, as well as brass parts. Even thin-walled workpieces can be machined. Cleaning of the surfaces is performed in parallel with the actual deburring process, which only takes a matter of seconds.

In the field of plastics, the new process offers a reliable and economic alternative primarily for injection-moulded parts made of polypropylene (PP), polyamide (PA) and polycarbonate (PC), including fibre-reinforced parts. This allows burrs that occur at the separating layers of the injection moulding tools to be removed in a targeted way. However, the process also allows so-called "flashing" to be removed across the entire surface of parts.

Manual and automated deburring

Another advantage of ultrasonic deburring is its excellent versatility. For example, a mobile handheld deburring device can be used for various tasks, including those which previously took a lot of time and had to be performed manually using grinding stones





On this test specimen made of aluminium, the burrs on the cross holes were reliably removed using ultrasound also allows injection-moulded parts, such as this one made of PP, to be deburred efficiently

or spatulas, i.e. during final inspection before packaging. The guided movement of the sonotrode is also just as easily to mechanise and fully automate. The latter allows the innovative process to be integrated into automated production lines.

Application tests with original parts can be performed in the company's Innovation Lab.

Weber Ultrasonics AG develops, produces and markets solutions and components for the industrial deployment of ultrasonic technology. It specialises in cleaning, welding and cutting with ultrasound as well as other special fields of application. The company is certified in line with DIN EN ISO 9001 and has already won multiple awards for exemplary corporate governance. The family-run medium-sized company with its headquarters in Karlsbad, Germany, employs more than 130 employees worldwide. Weber Ultrasonics AG has subsidiaries in the USA and Asia.

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Costa sets the new benchmark for automatic deburring machines

FICEP UK has announced that it has been appointed exclusive UK agent for Costa, a world-leading manufacturer of automatic metal deburring and surface finishing machines.

These high-quality machines have an unrivalled reputation for reliability and performance for the deburring of plasma/oxi fuel /laser cut parts, the grinding of all flat, ferrous and non-ferrous metal parts to a desired quote and the polishing of large metal surfaces to provide the finest finishing available with a complete absence of chatter marks.

When there is a mix of materials or a different finish is required, Costa machines have a unique patented LOCK system which provides total flexibility, reduced downtime between changeover of brushes and easier maintenance.

Depending on the edge radius required, vertical or orbital type brushes can be used, either individually or in multiple groups to ensure the required finish is achieved on the top or the top and bottom sides of the component in one pass.

Parts up to more than 400 mm thick and more than 3,000 mm wide can be processed and the polishing systems have a feeding speed of up to 50 mt/min. This makes these machines the ideal solution for removal of slag, burrs and oxide even when the parts are warped or uneven.

When polishing wide stainless-steel sheets, the quality of the surface finish remains consistent until belt life end as the machines automatically compensate for wear of the belts. This is possible thanks to the machine's inbuilt PLC which extends the life of the



consumables which further reduces processing costs. All machines in the Costa range exceed CE and OSHA approval, with noise reduction systems and special devices to protect operators and to also prevent parts from getting damaged. Not only do the machines eliminate dangerous and time-consuming manual grinding work but they also massively increase productivity and reduce production costs.

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Walter extends automatic loading options

Two new automatic loading developments for the large-capacity Walter Helitronic Vision 400L grinder and the two-in-one Vision Diamond 400L grinding/eroding machines have been announced by Walter Ewag UK, a member of the United Grinding Group.

Both the Top-Loader and Robot Loader 25 add new levels of automation to the machines, permitting enhanced levels of unattended production.

Integrated into the machines' existing construction and with no restriction to the working envelope, the Top-Loader features a pneumatic swivel arm with gripper to integrate with Walter's standard robot pallet system for tools up to 32 mm diameter.

The two-pallet system, one each for blanks and finished tools, can each accommodate up to 500 tools (depending on size) and tool change takes just 27 seconds. In addition, setup times are minimised by a teaching function for automatic setup of the pallets.

The Robot Loader 25, meanwhile, can accommodate 21 tools of up to 315 mm diameter and weighing 25 kgs (or 28 tools of up to 220 mm diameter or 70 tools up to 105 mm diameter).

Equipped with a FANUC robot and featuring new software that accommodates the 'random' loading and storage of tools and blanks in HSK holders on up to seven pallets, the efficiency and effectiveness of the Robot Loader 25 is enhanced by laser marking for tool setup and optional



The new Top-Loader (above) and Robot Loader 25 (below) add new levels of automation to Walter Ewag UK's Walter Helitronic Vision 400L grinder and two-in-one Vision Diamond 400L grinding/eroding machine



Examples of the tools produced by Elite Tooling on its Walter Helitronic tool grinders

'diameter determination' functionality for automatic operation.

Both the Walter Helitronic Vision 400L tool grinder and two-in-one grinding/ eroding Helitronic Vision Diamond 400L machines can accommodate tools up to 315 mm diameter and 420 mm long. The latter can process (grind/erode) rotationally symmetrical precision tools in PCD, carbide, HSS, ceramic, cermet and CBN in a single setup.

Tooling manufacturer enhances its position with new machines from Walter

A trio of Walter Helitronic Power multi-axis tool grinders, plus a Walter Helicheck tool measuring machine, are enabling Elite Tooling to consistently reinforce its standing as a manufacturer of world-class special-purpose tooling for customers in the aerospace industry as well as medical and Formula One sectors.

The machines have been installed over the past decade or so, following the company's establishment in 1995 initially as a distributor for Tivoly tools, before the Rotherham-based firm progressively moved into tool production and regrinding, which account for 80 percent and 20 percent of output, respectively. The company eventually became part of the Tivoly Group, a France-based 83 million Euro turnover business.

According to production manager Lee Burkill, who has been with the company for 11 years, it is the machines' Tool Studio software and Eco Loaders as well as their solid construction that leads to consistently reliable operation. This has stood the company in good stead and in 2017 led to the investment in its latest Helitronic Power with Eco Loader, supplied by Walter Ewag UK, a member of the United Grinding Group.

Walter's Eco Loaders are available in versions able to accommodate 165 tools. The Eco Loader is mounted on the machine's work table and the loading/ unloading gripper is integrated into the grinding head.

"Specialising in mainly carbide bespoke tooling of all types, including profile and multi-step cutters usually machined in quantities of one- to 10-off to micron tolerances, as well as the production of Tivoly's standard tools for drilling milling, boring, tapping and threading in batches of say 100, we regularly use the Eco Loaders for unmanned operation, especially for overnight production," explains Lee Burkill.

"This ability to maximise production times, coupled with the functionality of Tool Studio for quick and easy programming and simulation of tool designs, contributes to our ability to produce high-class tools in turnaround times that our customers demand."

Tools are designed and manufactured from scratch and speed of production is such that Elite Tooling can often deliver a tool in the time it takes some companies to quote. This ability for fast turnarounds is based on a comprehensive stock of semi-finished blanks, with cylindrical step grinding being undertaken in-house.

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Unleashing a new world of possibilities

The FCP4 High Production Drill Grinder that can produce a completed drill in 20 seconds

ANCA is again first to market with the FCP4 High Production Drill Grinder (FCP4). Producing drills from 0.8 to 4 mm, the new technology provides an exciting opportunity for drill makers, with important efficiencies and cost benefits by manufacturing a complete high-speed steel drill on a single machine. From a blank piece of raw material, the FCP4 grinds the flute, relief and point to produce a finished drill.

ANCA CEO, Grant Anderson says: "Considering the yearly production of high speed steel drills is about 1.8 billion drills, the opportunities are huge. The high-volume commodity drill market is a new market for us but is a great fit given our forty plus years' expertise in tool and cutter grinding and our world-leading technology."

The new machine will enable a complete drill to be manufactured every 20 to 25 seconds, a significant difference from what is currently available in the market. Up until now a drill has been manufactured on two or three separate machines which is a large investment to make and a big task in changing drill sizes, typically taking several hours and creating needless waste with scrap setup drills. The CNC capability of the FCP4 also has significant advantages in quicker changeover and less setup times required, making the option of smaller production runs viable.



"We think we can bring a huge benefit to the industry as up until now there is little competition or product choice for volume manufacturers of HSS drills," continues Grant Anderson. "Drill manufacturers are typically restricted to using machines that are old and CAM operated, and with older machines wearing out there are currently very few options for upgrading or improving their capabilities."

Simon Richardson, FCP4 product manager says: "We listened to our



customers who, in this market, faced a lack of choice and responded to their needs to develop our own solution. With our extensive market knowledge and research and development capabilities, I am confident this new machine will be well received and unleash a whole new world of possibilities for our customers."

The fully CNC-operated FCP4 will comprise eight axes, using a principle similar to a Swiss Auto, whereby it has a multi turret, capable of undertaking several operations simultaneously. It uses an ANCA Motion CNC system including AM5C drives, AMI5000 Touchpad, Commander, AMCore and Motion Bench.

To watch a video of the FCP4 in action, visit: https://www.youtube.com/ watch?v=Nk8Cdk344a8

Key features include: complete drill production from HSS blank; full CNC grinding and dressing operations; fully enclosed machine canopy with safety interlocks; ANCA Motion CNC and drive technology; intuitive and user-friendly operator panel with touch screen; flute shape adjusted by CNC and form dressed on the machine.

Benefits include: superior surface finish and drill geometry; quick changeover time facilitates small batch runs, as low as 20 minutes; minimised setup scrap; adjust programs in cycle to optimise drills being ground.

Tool & Profile Grinding

ANCA's LaserPlus improves PCD tool accuracy and reduces waste, while enabling lights out manufacturing for electro-discharge grinding

Once again, ANCA is launching new technology to bring tremendous benefits to its customers with the highly successful LaserPlus system on its EDGe machine. The EDGe is used to erode PCD cutting tools, which in turn are widely used in aerospace, automotive, electronics and wood industries.

Duncan Thomson, ANCA product manager says: "The LaserpPlus technology on our high performing EDGe machine is helping our customers achieve much better accuracy and reduce waste. It ensures all tools in a batch stay within target tolerances, regardless of external influences such as wheel (electrode) wear or machine growth due to thermal variation. The result is improved tool consistency, quality and reduced scrap tools."

ANCA's EDGe machine includes its proprietary eSpark generator for optimal PCD erosion results. This means that on the one-wheel spindle, two-wheel packs



Duncan Thomson continues: "For customers manufacturing PCD cutting tools the laser technology provides real value due to the unique challenges involved with the process of electro-discharge grinding (EDG).



support both erosion and grinding operations, making it a highly versatile machine. The addition of the LaserPlus further enhances the machines capabilities for customers.

First introduced on ANCA's tool grinding machines, the LaserPlus system allows newly ground tools to be automatically measured in the machine using a non-contact Blum laser system. Then, if required, compensation is automatically applied to subsequent tools in the batch. "Without touching the PCD cutting edge, LaserPlus can measure a cutting tool feature before the final erosion pass. By doing this, the technology can identify any variation, which may, for example, be the result of thermal drift or wear on the electrode, from the nominal size and account for this in the final finishing pass. The result is that the finished tool geometry is guaranteed to be on size," he concludes.

For manufacturers of PCD tools where the cost of a PCD tool blank is considerably



higher than equivalent carbide, having the security of knowing you can run a batch of tools unmanned, and have none scrapped is valuable indeed.

LaserPlus also brings with it useful features, such as automatic generation of a cutting tool measurement report that can be sent together with the tool to ensure your customer quality assurance expectations are met.

ANCA is a leading manufacturer of CNC grinding machines. It was founded in 1974 in Melbourne, Australia where the company still has its global headquarters. ANCA has offices in the UK, Germany, China, Thailand, India, Japan, Brazil and the USA as well as a comprehensive network of representatives and agents worldwide. ANCA CNC grinders are used for manufacturing.

ANCA CNC grinders are used for manufacturing precision cutting tools and components across a diverse range of competitive industries including cutting tool manufacture, automotive, aerospace, electronics and medical.

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ITC invests in new grinding technology

In 2016, Industrial Tooling Corporation (ITC) extended its manufacturing facility by over 50 percent. Now the Tamworth cutting tool manufacturer has invested well over £1 m in state-of-the-art manufacturing equipment to extend its product ranges and enhance manufacturing capacity and productivity, in order to enhance the remarkably high-quality standards the company maintains.

The investments at the leading UK cutting tool manufacturer include two Rollomatic grinding centres, a centralised Vomat micro filtration coolant system, a Haimer balancing machine as well as an Action Super Abrasives (ASA) wheel dressing machine. The new equipment was delivered in September and has been fully operational since October.

The Rollomatic machines include the new ShapeSmart NP5 blanking machine, ITC's third Rollomatic precision cylindrical grinding machine. Ideal for preparing tool blanks, the NP5 has an integrated 3-axis robot loader for automated and lights-out blanking of rotary tool shanks from 0.025 to 25 mm. Alongside the ShapeSmart NP5 is the new Rollomatic GrindSmart Nano 6, the UK's first Nano 6 installation. This high-precision 6-axis grinding centre has been designed for high performance production of micro-tools a diameter range between 0.03 – 2.0 mm.

With innovative hydrostatic technology, the GrindSmart Nano 6 achieves concentricity tolerances below 0.001 mm, while the integrated robot loader can accommodate up to 1,000 tools. The two Rollomatic additions enhance capacity and productivity, while the Nano 6 in particular will enable ITC to extend existing ranges with precision diameter offerings as small as 0.1 mm diameter.

Commenting upon the installation of the two Rollomatic machines, ITC's managing director, Peter Graves says: "The two Rollomatic machines will increase our capacity levels in line with business growth. The third blanking machine, the NP5 can run around the clock to meet the everincreasing demand for our product ranges, whereas the Nano 6 is a micron precision grinding centre for processing tools below 2 mm diameter. This will enable ITC to extend existing product lines to sub 3 mm diameters in line with customer enquiries. It will also allow us to investigate the feasibility of introducing new micro tool ranges."

To ensure optimal conditions, ITC has also installed a centralised coolant system from Vomat. Now linked to all grinding centres at ITC, the temperature controlled Vomat coolant system guarantees coolant is maintained at a constant and cooled temperature in all grinding centres with ultra-fine filtration. The high-end Vomat system will extend grinding wheel service life and further enhance the surface finishes of cutting tools, which in turn will extend the overall quality and performance of the already impeccably high-quality cutting tools.

Also driving the ongoing improvement in productivity and performance is the new ASA wheel dressing machine. In the first couple of weeks since installation, there has been a dramatic improvement in grinding





wheel service life and surface finishes on tool faces have also improved. These enhancements are also a result of the Haimer Tool Dynamic wheel balancing machine that now sees ITC balancing grinding wheels on all its grinding centres.

"With the additional manufacturing footprint, we not only have the space to install production machines, but also invest in technology that will augment our ongoing commitment to customer services and product quality. We will continue ordering high-tech machine tools through the remainder of 2017 and beyond," concludes Peter Graves.

ITC is a specialist tooling supplier. Its objective is to supply our customers with the best possible products, at the same time making them more efficient by introducing productivity and method improvements. To achieve this, it continues to invest in its team of capable and enthusiastic engineers and technical sales people, backed up by an in-house team which it believes is second to none. From solid carbide and PCD tooling, through to indexable milling, turning and boring, plus top-quality tool holders, ITC has an unbeatable product range.

It manufactures and source the best available products from around the world, and holds well over 100,000 solid carbide tools, tool bodies, inserts and toolholders on the shelf ready for same day despatch. ITC also offers modification and regrind services, in order to adapt existing tools to your requirements and return used tools to an 'as new' condition.

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Tool & Profile Grinding

Dress to impress

If you want to produce high-precision profile inserts, your tapered diamond grinding wheels need to be dressed on a regular basis. Haas opts for the profile accuracy of the XING dressing technique inside the machine.

Based in Trossingen, Germany, Haas Schleifmaschinen GmbH has many customers that manufacture profile inserts, all of which value maximum dimensional accuracy and surface quality. The Multigrind® CU and Multigrind® CA are the grinding machines most frequently used. The grinding tool of choice when it comes to machining profile inserts is often the tapered or V-shaped diamond grinding wheel, which needs to be dressed, i.e. brought into the correct geometric form, on a regular basis to ensure exceptional grinding results.

Dressing with profile accuracy

The extremely precise tapered diamond grinding wheels often feature an edge radius of just a few hundredths of a millimetre and are correspondingly sensitive, which is why Haas opts for the XING dressing technique. The dresser wheel axis is not positioned parallel to the grinding wheel axis, as it is with other techniques, but rather at a 90° angle, meaning the silicon carbide or corundum wheel often associated with other diamond grinding wheels can be used for dressing. Thanks to the NC-controlled process, the radius of the grinding wheel can be generated with the circumference of the dresser wheel, thus maintaining a consistent contact surface and pressure between dresser wheel and grinding wheel. The benefits of XING dressing include a lower pressure load and higher profile accuracy for the grinding wheel.

Dressing without unclamping and re-chucking

Like all other dressing techniques at Haas, XING dressing is also carried out inside the grinding machine, so there's no need to unclamp and re-chuck the grinding wheel. This has a positive effect on dimensional accuracy, while the grinding wheel boasts better radial and axial runout, making it possible to generate better surfaces. This is something you can actually hear while grinding; the wheel sounds much "healthier" during the grinding process.



XING-dressing a tapered diamond grinding wheel, which is positioned at a 90° angle to the dresser wheel



Machining a profile insert for machining on a Multigrind CU grinding machine

Due to the very good experiences Haas has had with XING dressing, this technique will be expanded for use in additional applications. In current projects it is applying the technique to profile grinding wheels, grinding pencils or quills and grinding wheels with other grain types, as well as ceramic and hybrid-bonded grinding wheels. As a result, many different wheel contours can be dressed using the Multigrind grinding machines. However, this is only possible if the option for direct or indirect wheel probing is available. A noise sensing system is always required for setting up, optimising and operating the dressing process. When it comes to V-shaped wheels with a 30° included angle, the wear is highly dependent on previous wheel damage, meaning the existing wear behavior needs to be measured and compensated for.

XING dressing used to be called cross-dressing

The mechanical engineers at Haas grin when asked why this dressing technique is now called XING dressing and no longer cross-dressing. Cross-dressing has nothing to do with grinding technology in English, but instead refers to, according to Wikipedia, "the act of wearing items of clothing and other accoutrements commonly associated with the opposite sex." What does XING mean? XING is the abbreviation for "crossing" in American English and that's a much better fit.

Haas Schleifmaschinen GmbH, headquartered in Trossingen, Germany, is an international system supplier for complex grinding jobs for the tool manufacturing, medical engineering, and aerospace industries and specialises in tool grinding centres for complex shapes. The company produces three types of machines, each in a wide variety of different variations: the Multigrind®CA, CB and CU systems.

Haas grinding machines are used to machine rotary and profile tools, gear cutting and cold forming tools, as well as medical instruments and implants. Haas Schleifmaschinen GmbH is the world's leading supplier of machines for implant manufacturers. The very modern software Multigrind Horizon is an intuitive, geometry-based grinding program that opens up new horizons in terms of user-friendliness, transparency and performance. It benefits the user both during the design phase and while they are working on the machine.

Haas Schleifmaschinen GmbH

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Neher has its finger on the VPulse

PCD tooling manufacturer improves productivity and precision with new Vollmer VPulse 500

Ostrach-based family business Neher develops special tools for the international manufacturing industry. To ensure its successful market position, the company recently opted for the VPulse 500 wire erosion machine from VOLLMER. Developed by the Biberach-based sharpening specialist, the VOLLMER machine allows Neher to manufacture its PCD-tipped (polycrystalline diamond) tools with a high surface finish.

"We manufacture customised diamond tools for our customers which generally have complex geometries, particularly when it comes to combination tools such as milling cutters and reamers", states Gerd Neher, managing director of the German Neher Group in Ostrach-Einhart. "For this we rely on the erosion technology from VOLLMER and we recently decided to purchase the fully automated VPulse 500 wire erosion machine."

Often more than 150 special tools per order

Neher is one of the leading manufacturers of special tools made from PCD that are mainly used in the automotive sector. The company develops bespoke circular milling tools, face-milling cutters, stepped reamers as well as combination tools for its customers. The tools are specially tailored to the components they are intended to manufacture. Tool development generally originates from the design drawing of the component and with the machining of complex components such as gearbox housings or steering boxes, Neher can see up to 30 different PCD tools developed for specific components. As the customers generally want a quantity of each tool, more than 150 special tools can be specified for any particular order.

Wire erosion around the clock

Neher uses wire erosion for processing its PCD cutting edges. The process is ideal for tools such as contour cutters or stepped reamers that have complex geometries. With the VOLLMER VPulse 500 wire erosion machine, even the tiniest inner radii can be machined precisely. Typically, special tools require machining times that range from 30 minutes for simple reamers up to 20 hours for complex combination tools.

"Thanks to the fully automated VPulse

500, we can work in single-shift operation and still manufacture around the clock and also over the weekend", states Anton Juric, application engineer at Neher. "For this, we use the external tool memory of the wire erosion machine, where we can store a total of 16 different tools."

Simple operation for error-free work

VOLLMER has equipped the VPulse 500 with a new erosion generator and advanced technology that allows the production of batch sizes from 1-off to large quantity batches. The modern machine kinematics ensure high profile accuracy, not only in production but also in servicing. Another key reason Neher decided to purchase the VPulse 500 was its simple and intuitive operation. The touchscreen allows you to easily program and control the machine for quick, error-free work.

Expansion of business overseas making good headway

Neher is currently planning on purchasing another VPulse 500 to boost the targeted level of growth. In summer 2017, Neher concluded a joint venture with the American



Tool & Profile Grinding

company Star SU from Michigan (USA). With locations in the USA, Canada, Mexico and Brazil, as well as many years of experience in the North American manufacturing industry, Star SU is a competent partner for the overseas market. The plan is to now use the new VPulse 500 on site in the USA. "Wire erosion plays a central role in the production of PCD special tools, which is why we also further developed our tried and tested technology", states Dr.-Ing. Stefan Brand, managing director of the VOLLMER Group. "Neher has been with us from day one in the design and implementation of the VPulse 500 and they played a big part in ensuring that the machine meets the high requirements of the tool manufacturer." More information about Neher can be found online at: www.neher-group.com and https://de-de.facebook.com/ NeherGroup/

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, eroding and machine tools for rotary tools, circular saws and band saws in the wood- and metalworking industries.

In offering this, VOLLMER relies heavily on the company's tradition and its strengths: Local contacts for efficient communication channels, quick decisions and rapid action by a family-run company.

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NUM to unveil major new release of tool grinding software

NUM will be launching a major new release of its renowned NUMROTO tool grinding software at GrindTec.

Visitors to NUM's Stand 7038 in Hall 7 will have the opportunity to gain a hands-on impression of this highly popular software package. The experience will benefit anyone involved in the manufacture or resharpening of precision machine tools, or who is interested in the future of CNC machine tool automation.

The new release of NUMROTO software Version 4.0 provides numerous new features and enhancements. These include new features for ball nose and corner radius tools, automated documentation of fully dimensioned wheel packages and grinding spindle power monitoring to facilitate adaptive grinding on specific machines.

The software's 3D simulation facilities now offer coolant holes in the 3D blank and DXF comparison profiles, as well as an all-new measurement mode.

First launched in 1987, NUMROTO software has become the preferred choice for many of the world's leading



manufacturers of machines for the production and re-sharpening of tools such as end-mills, drills, step drills, form cutters and many others.

Compared to most competitive products on the market, the software provides a much more direct and efficient path between tool design and manufacture. Featuring an integrated modelling-simulationinterpolation chain, NUMROTO avoids the sequential CAD-to-CAM and CAM-to-CNC translation phases of conventional software approaches and provides a true WYSIWYG output. This enables users of tool grinding machinery to sidestep multiple data format changes and emulations.

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Aqueous ultrasonic line installed for cleaning nuclear components

Derbyshire-based Paul Fabrications, a Unitech Aerospace company, has for a long time used both aqueous and solvent systems to wash machined, pressed and fabricated stainless-steel components for its customer, Springfields Fuels Ltd, near Preston, which supplies fuel pellets for advanced gas-cooled reactors in the UK. Paul Fabrications dispensed with solvent cleaning of nuclear components at the beginning of 2017, replacing it with a Turbex Pro 550 aqueous ultrasonic cleaning system.

The four-stage line is devoted to washing and drying all the nuclear components that support and hold the stainless-steel tubes containing uranium fuel pellets in the core of advanced gas reactors in the UK. All these components were previously processed in a trichloroethylene closed system at the Castle Donington site.

Peter Tryner, nuclear operations manager at Paul Fabrications, says: "We clean the associated braces, which are heavier components, in an aqueous spray washer but the other support components are too lightweight for processing in the same machine, as they would be distorted and damaged.

"We had a number of trials carried out using different solvents, but all of them left



Programming the Turbex cleaning line to process a fresh batch of machined 2205 Duplex support rings while the previous basket is being transferred automatically between the second and third stages

some type of stain after the drying stage. This would mean the components being rejected or even scrapped.

"We decided we needed an aqueous tank system that would perform the final clean on the stainless-steel components to nuclear



The batch of support rings being lowered into stage 3 by the transporter

required standard, without damage. Paul Fabrications asked three potential suppliers to quote."

The Turbex system was installed after two days of successful trials at the supplier's technical centre in Alton, Hampshire. Peter Tryner also went to see similar equipment in use in electronics and medical equipment factories and spoke with their production staff, receiving positive feedback from everyone.

Soils that need to be removed from the rings are principally press oil and coolant from machining centres. There is no or negligible swarf, as this is blown off before cleaning. Particularly important is that all traces of surface impurity, especially chlorine, are removed. The Turbex equipment achieves what Peter Tryner describes as a medical level of cleanliness and has received Springfields Fuels' validation to clean the components in this way.

The primary wash stage, which contains water and detergent at 60°C, is equipped with an oil skimmer and a dual frequency ultrasonic transducer that provides ultra-fine, high precision cleaning

Component Cleaning

performance. The next tank, also ultrasonic, holds tap water at ambient temperature for a secondary wash, while the third, rinse stage contains demineralised water at 60°C. The last stage is a blow-drying oven set at 120°C.

Batches of components are processed in stainless steel baskets, up to three of which can be in the system at the same time if throughput is high. Under program control, a transporter lifts a basket from the input station and automatically moves it from stage to stage along the line, immersing it in each tank for a predetermined time and finally depositing it onto the output table. Program length is typically from 15 to 40 minutes, according to component size and shape.

The level of cleanliness stipulated by Springfields Fuels requires Paul Fabrications to test the water every day. The rinse stage must have a conductance of less than 100 microsiemens, while the first tank is checked with a refractometer to ensure that the amount of detergent is correct, as stipulated by the customer.

On receipt of the components and fabrications, Springfields Fuels visually



One of the laser-cut, milled and welded 2205 Duplex braces that hold an array of sleeves containing uranium fuel pellets. Paul Fabrications is currently seeking approval to clean these in the Turbex system as well

inspects 20 percent under magnification for cleanliness and also carries out dimensional checks to ensure that the drawing tolerances have been achieved.

In 2016, Paul Fabrications became the 100th UK manufacturing company to receive F4N accreditation through the

Nuclear AMRC's Fit For Nuclear programme.

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Increased profitability and component cleanliness is essential

Demand for ever finer tolerances in engineered components is placing pressure on manufacturers to meet increasingly stringent customer and industry cleanliness requirements, while still maintaining profitability.

Advances in technology within the parts cleaning industry give functional improvements and greater efficiencies that make such objectives more than achievable in most situations.

But despite these improvements, many manufacturers are failing to take advantage of the potential, according to MecWash Systems, specialists in the design and manufacture of aqueous parts cleaning and degreasing equipment.

John Pattison, managing director of MecWash Systems, says: "We have customers who have been required to provide increases in the levels of cleanliness of engineered components of 25-50 percent over the past year, within sectors such as automotive and general engineering.

"This is quite significant and might seem daunting to many manufacturers but, in most cases, it is more than achievable. Combine the latest cleaning systems with a robust and efficient cleaning regime and they can achieve the optimum levels required for customer and industry standards, while achieving dramatic efficiencies, reducing costs and ensuring profitability."

Alan Atkinson of MecWash Systems explains how one UK client manufacturing hydraulic valves had been required by a customer to increase levels of product cleanliness by 40 percent: "The challenge was how could this be achieved cost effectively. They required new equipment and the MecWash Duo was suited for the type of products being cleaned."

"We worked with them on a set of trials that also involved our in-house laboratory and chemist. The trials resulted in more than a 40 percent improvement in cleanliness achieved. This ensured the customer was able to

exceed the standards it had been set, while continuing to enjoy efficiencies in water and energy usage."

The Duo process includes immersion washing, which provides higher standards of cleaning by full solution contact with all component surfaces. In addition, it has a spray wash and a re-circulating heated spray rinse, which provides a high standard of surface finish, removing detergent residues left by the wash solution. This process is completed with a hot air dry.

A similar example is a US-based MecWash customer, Stewart Engineering. One of its customers wanted to raise the standards of cleanliness on finished products.

The tighter cleanliness specifications demanded meant that particles over 500 microns were no longer acceptable, gravimetric weight gain would be restricted to 25 milligrams and no amount of abrasive material, in this case residual honing grit, would be allowed at all.

Bill Westbrook, North American operations manager for MecWash, explains: "Where ten years ago particle sizes of 1,000 microns captured in a millipore patch test might have been acceptable, today it is not uncommon for heavy equipment OEMs to demand maximum particle sizes of 500 microns or even less.

"This was the requirement from this customer to meet the new gravimetric limits on



components that are critical to the fuel, oil, and airflow inside of engines, pumps, and compressors."

The customer commissioned a MecWash Maxi. John Pattison explains: "Due to the Maxi's high performance and huge cleaning capacity, we were able to offer Stewart a system that could both achieve their customer's cleanliness requirements and surpass Stewart's goal of cleaning 80 turbo bearing housings per hour.

"For many customers, our existing systems such as the Duo and MWX400 can be configured to meet their needs, but if not, we will work with them to create totally bespoke solutions."

MecWash Systems Ltd was established in 1993 to specialise in the design and manufacture of aqueous parts cleaning and degreasing systems for engineering components offering a safe and practical alternative to harmful solvents.

Its facilities include: laboratory and R&D area for analysing customer samples; design office with Solid Works 3D modelling software; manufacture facility for washing and water recycling systems; refurbishment and enhancement capabilities for used machines; manufacture facility for cleaners and inhibitors; agents/distributors around the world; team of service engineers to maintain systems at peak performance.

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



Not all degreasers are equal

Peter Crossen, VP of the Maintenance and Partsmaster Innovation Platform of water, energy and maintenance solutions provider, NCH Europe, discusses how, despite traditional perceptions, solvent based degreasers aren't the only option

Degreasing is a vital part of good maintenance practice, not least because industrial grime could be covering abnormalities or problem areas that could incur costly downtime and higher maintenance costs.

Reducing the cost of maintenance isn't the only way degreasing can save money. Just 0.25 mm of dirt on a heating exchange coil will lead to a 40 percent increase in

electricity usage. However, plant engineers seem to be blind to the volume choice of degreasers on the market and getting the right one for the job is the key to capitalising on these savings.

For years, solvent degreasers were pretty much the only thing available, so it's easy to see why businesses have been oblivious to the development of water-based alternatives. Water-based degreasers use surfactants to emulsify greasy build up and contain penetrating agents that increase the speed of degreasing.

Compared to solvents, they can be used on a variety of surfaces safely, such as plastic and rubber. Being pH neutral, like NCH Europe's Aqua-Sol Neutra Split, also means the degreaser won't cause damage on any surface it is being used on; as well as reducing potential risks when handling or storing them and mitigating certain regulations on handling, transport, storage and labelling.

Water-based degreasers also offer fantastic value for money. Due to their composition, they are transported as concentrates and can be effectively diluted up to a ratio of 1:500.

There are such a variety of water-based degreasers that it's often easier to find one to suit your specific needs than when searching for something with a solvent base and they can be just as effective.

Water-based degreasers are also a more environmentally-friendly, safer alternative to

work with. Vapours from solvent degreasers can cause inhalation health risks whilst the high levels of VOC's (volatile organic compounds) found in solvent products can mean you risk being in breach of storage legislation. Water based degreasers do not pose inhalation risks, have no or very low levels of VOC's and are non-flammable.

However, this does not mean they are less effective. For example, Aqua-Sol Power is

offer more choice and help plant engineers get the job done safely, effectively and with a reduced impact on the environment.

In general, there's little need for the vast majority of companies to be so heavily reliant on environmentally harmful solvent-based solutions. The longer this reliance goes on, the more damage we risk doing to the environment, not to mention the space we waste storing them instead of



the most powerful degreaser we have ever developed at NCH Europe. The water-based product uses the latest surfactant technology to break even the toughest bonds that fix greasy soils to surfaces.

Water-based degreasers are also ideal for the food industry. Anything used in a food processing setting must be food-safe to eliminate risk of contamination, even degreasers. So, any degreaser you choose needs to be NSF certified like the NCH Europe range. Very few solvent degreasers achieve this accreditation.

Of course, solvent degreasers still have their place. In the electronics industry, for example, it's certainly not wise to spray around a product that is made up mostly of water and it's essential for the degreaser to evaporate quickly. In these situations, water-based degreasers won't replace solvent alternatives completely, but they will concentrates, the extra unnecessary costs, and the ongoing risk of harm to the user and potential damage to the end product.

When Dyson released its first vacuum cleaner traditional Hoovers found themselves cast aside in favour of the new, more efficient and user-friendly design. So why stick with the old model when advances in degreaser technology can offer a better all-round result? There's a place for water based, solvent and specialist degreasers, but maybe it's time we start to think about what's best for the job at hand rather than simply sticking with tradition.

NCH Europe Tel: 01902 510254 Email: customer.services@nch.com www: ncheurope.com/en

BvL system for cleaning specific castings

Reliable cleanliness and dryness in a chamber

Production and machining of all types of castings create comprehensive cleaning demands for the workpieces. The cleaning systems from BvL Oberflächentechnik offer various options for achieving the desired cleaning results. With decades of experience, the renowned manufacturer from Emsbüren produces individual cleaning systems in-house, designed and manufactured to individual customer specifications.

Systems for a variety of demands

The portfolio of the company from Northern Germany includes turntable systems for different workpiece dimensions (under the name "Ocean"), rotary indexing systems for space-saving implementation of a variety of processes (Twister), as well as large parts systems (Pacific) and deburring processes with high pressure (Geyser). Foundries most often use the Yukon system type because these continuous systems are especially suitable for series production of components.

Specific application example for spray flood cleaning

For cleaning automotive parts in the production of a German foundry, a NiagaraMO basket washing system with an automated roller conveyor was linked to a





manual customer interface. Corresponding workpiece carriers were manufactured, each for two sets of three identical components. The filled workpiece carriers are supplied to the roller conveyor with a feed carriage and loaded. After automated feeding into the cleaning chamber, a special nozzle system carries out all-around spray cleaning. The subsequent flooding of the entire chamber removes swarf from the inside of the components. Another spray cleaning step removes any remaining swarf and suspended particles from the component surface. The last particles are removed from the components using a separate tank and the required residual contamination value is achieved with a correspondingly configured fine filtration.

Absolute dryness included

An impulse blowing device uses compressed air to reduce the liquid present on the components, preparing them for efficient drying. The integrated vacuum drying then ensures the required absolute dryness of the workpieces. The roller conveyor finally transports the workpiece carriers away. For manual transport of the parts to the subsequent tightness test with the feed carriage, the system was programmed to provide a buffer space for three workpiece carriers in each case. This allows the BvL system to perfectly integrate into the overall customer process.

BvL Oberflächentechnik GmbH is one of the largest suppliers of water-based industrial cleaning systems in Germany. As a system partner, BvL offers comprehensive customer solutions through integrated services, from simple cleaning units and filtration and automated solutions to complex large projects with process monitoring, always complemented by reliable service. The domestic market in Germany is the most important target market for the approximately 150 employees at BvL Oberflächentechnik. With regard to exports, the company has expanded its position on an international scale and can rely on an extensive sales and service network in 19 countries.

BvL cleaning systems stand for intelligent, well thought-out solutions in production facilities, covering several processes Quality and energy efficiency are a priority for us. How can efficient cleaning be achieved despite increasing requirements for the technical cleanliness of products? BvL's solutions are the result of expert advice and trials at its technology centre, help users to master this challenge.

BvL systems provide reliable cleaning for your components and can be integrated seamlessly into the production line. They are easy to operate and comply with the strict guidelines of the automotive industry. In addition, they are designed in line with the Machine Directive 2006/42/EC, C standard EN 12921-1 for machines for surface cleaning and the German Accident Prevention Regulations (UVV).

BvL Oberflächentechnik GmbH Tel: 0049 590395160 Email: info@bvl-group.de www.bvl-group.de

Customer-driven solutions

Since 1953, PERO's ambition has been to offer its customers cleaning units that are unrivalled in the market in terms of innovative technology and high-quality components. PERO cleaning units are developed and manufactured at its factories in Königsbrunn and Gotha in Germany. The machines are made from internally developed and produced assemblies, with components purchased from renowned specialist suppliers. This ensures that its systems are not only extremely effective and efficient but also very durable. Spare parts are available in stock for a period of 10 years or more.

Pero Competence Centre event

The Pero Competence Centre enables existing and potential customers to develop their cleaning processes systematically. More than 15 machines are available in an area of 1,100 m². Consultants are available to discuss your specific needs.

You can determine the spectrum and nature of your parts, verify cooling lubricants and machining residues. You can also examine manufacturing environment, prior and successional production steps, define cleanliness targets and expected technical cleanliness, as well as test alternative goods carriers and optimise the transport of individual components, bulk materials, batch goods, rack and lay parts.

Established cleaning media for wet processes can be compared, as well as cleaning on alternative machines and the optimum cleaning process.

Kumi Solutions has represented German advanced parts cleaning systems manufacturer Pero for 15 years. During this time, it has developed an excellent reputation for solving customers' cleaning issues, such as cleanliness standards, throughput, process reliability and machine up time. With 65 percent repeat business, Kumi is confident that it has the right combination of equipment, knowledge and resources to deliver sound long-term solutions to its customers' process critical applications.

Kumi Solutions is principally involved in



the aerospace and automotive sectors, specialising in advanced parts cleaning applications. Most recent customers include United Technologies Corporation, John Guest and Rolls-Royce.

Pero is hosting a special customer event at the Competence Centre in Konigsbrunn on 18th and 19th April. To arrange a visit, contact:

Kumi Solutions Ltd Tel: 02476 350 360 Email: info@kumi-solutions.com www.kumi-solutions.com

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Reich flexible couplings deliver the power for high pressure cleaning

When it comes to cleaning, there is no more environmentally-friendly solution than using water. When directed precisely at a surface under high pressure, water is a highly effective cleaning medium and has proven to be the perfect solution for many industrial applications.

High-pressure water systems are commonly used to clean the internal and external surfaces of different types of containers, industrial equipment and surfaces. Water is also used for other applications as diverse as cleaning pipes, ducts, heat exchangers, ship-sides and even airport runways. The engines that power these high-pressure cleaning units are usually connected to a plunger pump, and in applications such as this, Reich-Kupplungen offers the perfect coupling solution.

The mobile industrial high-pressure cleaning unit shown here comprises of a 180 kW diesel engine running at 1,880 rpm, directly connected to a 1,000 bar high-pressure pump, via a highly flexible Reich ARCUSAFLEX coupling. The different sizes within the ARCUSAFLEX flange coupling series cover a torque range from 200 to 110,000 Nm, corresponding to up to approx. 6,500 kW at 1,000 rpm.

The element versions are available in different torsional stiffness's and allow for tuning to the most favourable torsional vibration situation. The flange connection dimensions of ARCUSAFLEX couplings comply with SAE J 620 or DIN 6281 standards. Alternative flange dimensions and lengths can be supplied upon request.

When a highly flexible coupling is employed in a drive train, the resonance





frequencies are usually moved outside of the operating speed range. Critical torsional vibrations and torque shocks, not only generated by the engine, but also by the pump, are damped at the same time. The optimised design of highly flexible Reich couplings, which takes into account both the excitations from the engine and the pump, extends the service life of all power transmission components, therefore reducing the total cost of ownership. The respective torsional vibration calculations are performed as a customer service by Reich-Kupplungen for high-pressure pumps, screw and piston compressors, and all combustion engine drives.

With a heritage spanning over 70 years, Reich-Kupplungen is recognised today as a specialist in power transmission technology. From the beginning, everything has revolved around rubber technology, elastomers, and bonding with all types of metals.

Product development and production has always been performed in-house, ensuring the highest levels of competence in the design and manufacture of couplings for every power transmission application.

Reich-Kupplungen offers a comprehensive range of couplings, allowing the most appropriate variant to be selected for virtually any drive application. In addition, customer specific applications can be developed, and prototypes manufactured in line with this company's D2C (Designed to Customer) philosophy.

Reich Drive Systems UK Ltd is a wholly owned subsidiary of the Dipl.-Ing. Herwarth

Reich GmbH, headquartered in Bochum, Germany. For more than 65 years, Reich-Kupplungen has produced a wide range of torsionally flexible couplings. One of the exceptional key features is its in-house development and manufacture of elastomeric elements. All power transmission elements are manufactured in state of the art production facilities coupled with In-house test benches and inspection facilities ensuring that the couplings that are produced by Reich-Kupplungen are of the highest quality and used globally by many blue-chip companies.

Reich Drive Systems UK Ltd was founded in August 2014 and became a fully owned subsidiary of Reich Kupplungen GmbH on the 1st January 2015. For many years Reich has enjoyed an exceptional working relationship with Ringflex Drive Systems and they have proved themselves to be an excellent partner but sadly this relationship is approaching a time-based end with decision by the directors of Ringflex to retire in the next year or two. It was with this in mind that Reich took the decision to set up a new subsidiary in the UK. Ringflex staff members will continue to support the development of Reich Drive Systems UK to ensure a seamless transition of the business and also to safeguard the continuation of ongoing customer support and supply.

Reich Drive Systems UK Ltd Tel: 0161 714 4191 Email: info@reich-uk.com www.reich-uk.com

MicroCare introduces its ground-breaking green cleaners

The team from MicroCare Europe enjoyed a very successful Productronica Expo in Munich, Germany at the end of last year. With footfall upwards of 44,000 and visitors from 42 different countries, the MicroCare stand was overwhelmed by the positive feedback from end-users and distributors, all impressed by the company's new cleaning technologies.

With a strong message, innovative products and an impressive number of visitors on the stand, MicroCare Europe demonstrated an unwaivering commitment to helping companies clean their PCBs faster, better and at lower cost while meeting ever-more stringent European and global regulations.

The product which drew the most attention was the Tergo™ family of cleaners. MicroCare won a Global Technology Award at the show for the new halogen-free Tergo Chlorine-Free Cleaning Fluid. This product demonstrated excellence in innovation, a strong cost-benefit analysis, enhanced worker safety and improved environmental considerations, making it one of the most effective new cleaning fluids on the market. Another exciting development was the MicroCare participation in the IPC's hand soldering competition. MicroCare benchtop cleaners and the TriggerGrip™ cleaning tool were installed on all the workstations and the contestants found the products convenient and fast. Over four days, several dozen participants competed against each other to build a complete and functional electronics assembly within a 45-minute time limit.

Mike Jones, vice president of MicroCare Corporation, says: "I can confidently say that Productronica was a resounding success for MicroCare, perhaps one of the best Productronica exhibitions we have ever attended. "We were not sure just how the show would be this year, with the uncertainty of Brexit and other turmoil across Europe, but we were encouraged to see that traffic was intense and business is strong."

The MicroCare stand was continuously busy throughout the whole four days. Sales engineer Venesia Hurtubise made her first appearance at a Productronica event and



spent her time demonstrating the cost-saving benefits of modern cleaning fluids in a vapour degreaser. The degreaser was provided by C.C. Hydrosonics, from Harlow, UK. The equipment was used to demonstrate the impressive results that could be obtained by the Tergo family of cleaners. At the show, the selected fluid had been optimised to clean difficult solder pastes and flux residues from PCBs, while meeting the stringent new European F-Gas and REACH regulations.

MicroCare Corp Tel: 001 860 827 0626 Email: techsupport@microcare.com www.microcare.com

Inserts for automated cleaning of toolholders

Cleaning tool fixtures faster, process reliable and more economically

Whether it is drilling, milling or turning, residues from the machining are not only left on the part surface but also in the tools and fixtures. Cleaning of the latter is usually still done manually, even though cleaning of the manufactured parts is carried out in a cleaning machine. Specifically, for toolholders (e.g. HSK) and tool fixtures, Metallform has developed inserts, which can be easily placed in standard cleaning baskets. They enable the fast, process reliable and economical automated cleaning as well as transport of the assembled toolholder.

Clean toolholders significantly contribute to precision in machining. Therefore, it is surprising that fixtures are still frequently manually cleaned before the tools get replaced, because this process does not ensure that swarf and residues from processing media get removed reliably. Another disadvantage is the high demand on personnel and time caused by each manual process. Additionally, cleaning is usually performed with costly compressed air or brushes and a low flashpoint solvent such as benzine, although virtually every company that manufactures machined parts is equipped with a cleaning machine.

In order to also be able to clean the equipped toolholders in the cleaning machine, Metallform has developed specific inserts for standard cleaning baskets such as the MEFO-BOX. The inserts are available for different tool fixtures, e.g. HSK, Conus, VDI and SBA and can be adapted to the type and size of the holders. Fixation of the holder in the insert only takes place at uncritical areas. Adapted to the size of the working chamber of the cleaning machine, the equipped tool fixtures can be placed vertically or horizontally, for example, for deep-hole drills, in the insert.

For cleaning, various inserts can be placed in a MEFO-BOX or standard cleaning basket. On the one hand, this makes the cleaning of toolholders faster and more process reliable. This is especially due to the



open design of the inserts which allows the cleaning medium and mechanics, for example, ultrasonic waves or spray jet, to reach the toolholders freely from all sides. In order to improve the cleaning effect, the basket can be swivelled in the machine. On the other hand, automated cleaning increases efficiency. Staff that had been cleaning the toolholders manually can now spend their time with more productive work.

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Fully equipped standard shot blast machine offers a high degree of cost efficiency and flexibility

Rösler has introduced the RHBE 13/18 spinner hanger blast machine, which offers economical operation, even with relatively low production volumes. Rösler is able to offer this machine at a competitive price without making any compromises with regard to technical features and operational flexibility.

Shot blasting applications, for example surface cleaning, descaling, derusting or paint preparation, are essential stages in many manufacturing processes and can have a significant impact on the final quality of a product. Rather than depending on external subcontract shops, many manufacturers have started investing in shot blast machinery, the benefit being greater flexibility of production operations, reduction in transport costs and optimisation of the value-added chain.

Rösler specifically developed the new RHBE 13/18 spinner hanger blast machine for these types of manufacturers. This fully-equipped modular system, built according to Rösler's proven quality standards, offers many technical features at a very competitive price.

Excellent quality combined with operational flexibility

The new RHBE 13/18, designed for workpieces with heights of up to 1,800 mm (6 ft) and diameters of up to 1,300 mm (4.3 ft) can handle a wide range of different parts. The standard design features two blast turbines. However, customers can choose between different turbine types,

including the innovative Gamma 300 G. This universally usable turbine, which can also be installed in existing shot blast equipment, combines high productivity with excellent cost efficiency. Due to the curved design of its throwing blades, the Gamma 300 G is extremely energy efficient, while being considerably more productive than conventional blast turbines. This efficiency allows for utilisation of lower drive powers, for example 7.5 kW instead of 11 kW and, once the throwing blades are worn on one side, they can be simply turned around for use of the other side. This produces considerably longer blade uptimes and results in significant savings in maintenance time and spare part costs.

The Rösler spinner hanger machine blast chamber is made from manganese steel and in areas exposed to the blast stream is equipped with easily replaceable manganese steel wear plates. When designing the RHBE 13/18, Rösler's engineers made sure that all major blast media could be used. For example, unlike many other standard shot blast machines, the new Rösler spinner hanger machine can be run with grit or a mix of grit and round shot. Also when necessary, the blast media can be easily and quickly replaced with another media type.

The new machine is also equipped with a sizeable media cleaning and recycling system, a matching dust collector system and Siemens control. Despite the compact design, all machine components requiring maintenance are easily accessible.





Different machine options and the possibility to use all major shot blast media allow a wide-range of different workpieces to be processed in the newly designed, modular RHBE 13/18 spinner hanger blast machine.

The Rösler Group has been expert in the field of surface finishing for more than 80 years and offers the most extensive portfolio in the world of vibratory finishing systems, shot blasting, consumables and services. Leading companies from a wide range of industrial sectors trust in Rösler products and services. With its 15 subsidiaries and more than 150 sales agencies, the Rösler Group offers an extensive global network that is always close to its customers.

The job of its specialists is to design a system for customers finishing process, or a complete production line. Customers are in the best hands with Rösler and the company provides support throughout your machines' lifetime, from the planning phase, all the way to after-sales support and service. Its technology management team can work with you to develop the perfect finishing process, precisely tailored to your workpieces.

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BLAST CLEANING

Hanger-type blast machines meet flexible demands

The AGTOS standard program of hanger-type blast machines comprises of six machine sizes. Amongst other things, the choice of the appropriate machine concept depends on the workpieces involved, the required level of performance and, last but not least, on a customer's needs regarding an optimised production process. In the event that a standard model does not meet customers surface preparation needs, AGTOS will develop a tailor-made blast machine concept.

Capabilities and applications

Hanger-type blast machines are among the most flexible types of blasting equipment. They are used to remove rust, scale, sand and burrs from many kinds of workpieces. Hanger-type machines are also used for the finish blasting of sensitive workpieces or to roughen workpiece surfaces for subsequent coating.

As a rule, hanger-type blast machines are offered either for batch or continuous processing. However, there are many intermediate designs that are oriented towards different kinds of overhead conveyor systems. In many cases, different processes such as blasting, painting and subsequent drying can be interconnected via the overhead conveyor system. This makes it possible to tap an enormous potential for streamlining the process workflow.

Additional processing variants are created by using different kinds of workpiece holders to assist in the process of feeding workpieces to the blasting machine. In many cases, standard holders such as disks, baskets or rods can solve the application challenges. However, the increasingly detailed needs of customers often lead to the creation of tailor-made solutions.

Operation

Workpieces are placed in workpiece holders or are suspended directly from the running gear's rotating hook. The workpieces are then pushed into position in front of the blasting machine. An automatic feed mechanism then advances the workpieces to the first blasting position.

After the blasting program begins, the machine door is automatically closed and electro-pneumatically locked. As the workpieces rotate, they are blasted at three different blasting stations according to the pre-set blasting times. The blasting abrasive is continuously cleaned, recirculated and reused. An abrasive metering device feeds the cleaned abrasive from the abrasive storage bunker to the high-performance turbines.

Upon completion of the blasting cycle and after the turbines have come to a complete stop, the machine door opens automatically and the suspended workpieces return to the initial position. A fan unit creates the partial vacuum necessary to maintain dust-free operation of the blasting unit. Extracted air is cleaned in a special filter unit.

AGTOS was founded by a special group of individuals who live and breathe surface technology. Supported by 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 most important principle of the company philosophy is the



complete satisfaction of the needs and wishes of its customers. Its ultimate objective is a close and lasting partnership with these customers.

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 its plant in Poland, a complete warehouse facility at its headquarters in Emsdetten, 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. The equipment lineup is supported by a complete programme of services focused on blasting technology.

The company offers shotblast equipment which is tailor-made for diverse requests. It places special emphasis on providing perfect service for its customers. This applies not only to the blasting equipment it manufactures but also to other makes of equipment. Its service program includes: spare parts, modernisation and performance enhancement, repair and maintenance, instruction and training. On the basis of the surface quality specified, the internal logistics and the spatial conditions, the AGTOS sales team will collaborate with customers and the AGTOS project team to develop the perfect solution.

SLF & AGTOS UK Tel: 0843 5070030 Email: info@agtos.de www.agtos.com

World-class wet blasting

Vapormatt Ltd is one of the world's leading wet blasting companies, having developed the process over several decades. It offers a range of solutions for a large range of industries including aerospace, aluminium extrusion, composites, cutting tools, nuclear and wire.

The surface finishing expert can provide you with both automatic and manual systems to purchase or rent, a processing service allowing you to outsource or fully refurbished secondhand systems.

All the solutions benefit from the extensive knowledge of Vapormatt's design teams, process consultants and service engineers. This ensures that any solution it provides you with will meet your expectations of surface processing.

Founded in 1978 on the Channel Island of Guernsey, Vapormatt Ltd was formed to develop and manufacture wet blasting machines of high standard and quality.

With a strong focus on process and process control, Vapormatt has been able to

develop the wet blasting concept to the extent where its solutions have become highly consistent and repeatable in terms of performance. It prides itself on its ability to innovate and, on top of several world firsts, the company also holds numerous patents covering significant areas of process control, process slurry media filtration and blast gun systems.

Investment into the processes has led to Vapormatt's continued expansion across the globe and, with a presence in several countries, the Vapormatt wet blast process is accessible to an increasing number of industries and businesses.

Its success has been largely based on its commitment to a collaborative approach, working with customers to better understand their needs and becoming experts in their field. For industries requiring some of the best available solutions for wet blasting Vapormatt is often regarded as a



leader, setting benchmarks for others to follow.

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Eighty years of finishing equipment manufacture

Guyson International, one of Europe's largest finishing equipment manufacturers and eighty years old this year, offers a vast range of blast cabinets to suit every size and price and for nearly any application you can think of. Guyson intends to further engage through numerous sales and service activities with its extensive customer base and provide customers, both new and existing, with a series of 'value adding' services and benefits throughout its 80th year.

If you undertake any form of industrial maintenance cleaning, parts reconditioning, manufacture components that need deburring or descaling, clean dies, moulds or injection mould screws, need to remove old paint or rust, refurbish stone, or ceramic tiles or garden ornaments, then a blast cabinet will save you time and a lot of hard, manual labour.

Or if you are at the more technological end of manufacturing and are requiring the surface preparation of orthopaedic implants prior to hydroxyapatite coating, removing striation build lines, creating a variety of cosmetic surface finishes on 3D printed prototypes, reconditioning turbochargers or grit blasting turbine blades, then a blast cabinet can be your invaluable productive tool.



Additionally, they can also be used for shot peening medical, aerospace or automotive components, producing a value adding satin finish to aluminium Hi-Fi fascia's, or products requiring a specific even surface topography prior to anodising. The list of applications for a blast cabinet is virtually endless, so call Guyson to find out what great offers are available.

At entry level, it offers the Formula range of blast cabinets for the light industrial or periodic users, typical of which would be a small engineering company looking to blast clean various factory equipment during maintenance or service intervals.

For higher duty users, Guyson would recommend its Euroblast® cabinet range, with seven standard sizes and dozens of variations on each of these cabinets, tailored to specific product handling features. If faster blasting is required, removing casting investment, for instance, then Guyson also offers all of these blast cabinets in pressure fed options, which works about four times faster than the suction fed version.

Guyson also offers dedicated blast cabinets designed for operator comfort when blasting for prolonged periods of time. The Euroblast SBP4, a sit down version of the Euroblast 4, offers a comfortable seated operation for longer periods of intricate blasting, such as surface finishing 3D printed items or localised conformal coating removal from electronic boards. While the Euroblast Select delivers improved operator comfort by adjusting the height of the cabinet to suit the specific operator, removing stooping or reaching; the variable height of the cabinet can be controlled either manually or electronically.

Furthermore, Guyson is the preferred supplier of blast finishing stations to many of the world's 3D printing and additive manufacturing equipment suppliers and many bundle Guyson's Additive Manufacturing (AM) cabinet versions with their printing system. These AM finishing stations have been specifically designed for processing stainless, aluminium, titanium or Inconel components, commonly used in the aerospace, automotive and medical AM sectors.

A range of dust collectors designed and



developed to match the operational and environmental requirements of each Guyson blast system is provided with each blast system sold.

Aftersales and service

As a full-service provider, Guyson always holds a wide selection of blast media, including the popular glass bead and brown and white aluminium oxide and can quote media for use in any kind of blast system. Extensive spares are also provided for all Guyson blast equipment, going back many years and they can provide maintenance contracts which allow for planned visits to be carried out at regular intervals by experienced Guyson service personnel to keep your blast equipment running at its optimum level of performance for many years to come.

For all you need to know about the blast cabinets that Guyson has to offer, the options, the sizes and how to choose the best machine for you, call its customer services department on 01756 79911 and arrange for one of its sales engineers to visit, on a no obligations basis.

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Customised blast cabinet upgrades armature repair

From mobile phones to vehicle bodies, most products and equipment undergo vibration testing as part of their development or quality assessment. One of the leading companies specialising in vibration test system repair and maintenance has installed a customised blast cabinet from Hodge Clemco to upgrade its services.

Repair and rewinding of the electric coils in vibration equipment is a key service offered by Cambridgeshire-based 1G Dynamics and involves stripping existing copper wiring off the aluminium armatures along with any aluminium tube used for cooling the equipment. Before being rewound, the surface of the armature and cooling tube are prepared to provide a key for the final resin coating.



The Hodge Clemco cabinet allows armatures to be processed manually with a hand-held blast gun, while tubing is dealt with semiautomatically by means of four nozzles positioned around an exit hole in the chamber. Armatures are loaded into the cabinet on a track-and-turntable system that allows the operator to rotate them using glove ports, with a foot valve controlling blasting. All four surfaces of square tubing are treated

automatically as it is pulled through the chamber on to a spool turned by an operator.

The chamber measures 1,250 mm wide x 1,000 mm deep x 1,500 mm high and includes high-quality illumination, convenient viewing window and fully sealed glove ports. Double-skin construction has been used to reduce noise and extra ventilation has been included to improve visibility for operators. Boron carbide nozzles fitted to the five blast guns provide long-term durability.

The abrasive hopper has a removable screen to trap large particles, with smaller material being passed through a cyclone to remove dust and spent abrasive. A cartridge-type dust collector with a removable blower unit has been included for quick and easy exchange of filter cartridges.

Incorporated in 1959, Hodge Clemco has developed into a leading company in the surface finishing industry. Part of the 100-year old Samuel Hodge Group, Hodge Clemco is part of a diverse engineering group, founded around the marine industry.

Over the years, products such as "Contractor", "Craftsman", "JBlast" and "Clemco" have become the trade names for quality and reliability.

The standard range of blast rooms, cabinets, recovery systems

and dust extraction plant is backed up by an engineering team that can tailor solutions to customers' exact requirements. Successful expansion into this market has allowed the company to furnish many prestigious installations for the Ministry of Defence and Rolls Royce. Hodge Clemco was also one of the first companies in the industry to gain ISO9001.

In 2008, Hodge Clemco acquired the full share stake in Wolverhampton Abrasives, incorporating the company into its day to day business activities, together with Premier Equipment Services, which has added the IBIX range of ultra-portable blast machines and a low-cost range of airless paint pumps to our product range.

In April 2015, Samuel Hodge acquired Mac'Ants, a supplier of abrasives and blast materials, and one of the world's largest specialist plastic media manufacturers. Hodge Clemco can now offer an expanded range of abrasives, from plastic medias and aluminium oxides to garnets, sponge and a new efficient and economical abrasive for use in offshore markets.

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What is blast cleaning?

Blast cleaning is a process which is used to treat a surface, produce a surface finish or remove contaminants on a part. Different techniques can be used to produce this effect, two of those being dry blasting and wetblasting. The wetblasting process requires water mixed with different types of abrasive/media depending on the finish required. The slurry mixture, water and abrasive, is then propelled at high pressure and on impact cleans/etches or peens the substrate of the component. Dry blasting on the other hand, is when the dry abrasive media is accelerated through a blasting nozzle by means of compressed air only.

Different results can be achieved using these methods; for example a fine glass bead can be used to produce a softer finish. This is often required within industries that produce parts that need an aesthetically pleasing appearance on substrates such as aluminium, brass and bronze etc.

Component surface preparation is an essential step prior to the application of any coating. It is important that the part is clean with a rough surface as this impacts on how well the coating will adhere. This finish is achieved using a more abrasive media.

The Aquablast range

Vixen Surface Treatments Ltd manufactures different ranges of machines suitable for the blast cleaning process. The Aquablast range is its range of wet blasting cabinets that come in different sizes and can also include a variety of optional extras to make the process easier for the operator. The Aquablast cabinets are designed to simultaneously blast and degrease components in a quick and easy process to achieve outstanding finishing results on a variety of components. There are many benefits of wetblasting for different industry sectors including aerospace, automotive, construction and specialist manufacturing.

The main benefit of wetblasting is that the entire process is water-based within the cabinet. This means that the entire process is dust free which enables this machinery to be sited in clean areas and is also safer and easier for the operator. The water acts as a lubricant and causes a flushing action to occur preventing media impregnation in soft materials. This produces a softer satin sheen than dry blasting, which is another main benefit of the wetblasting process. The water mixed with abrasive alongside the altered angle produces a lapping effect, which travels across the surface of the components, creating a satin/polished finish.

Types of media

The type of media used in this process can change, depending on the desired finish. A range of results can be achieved by altering the type of abrasive and blast pressure applied. The finish can also differentiate by using the same type of media but changing the grade. For example, a fine glass bead will produce a more polished, satin finish

which is often used for an aesthetically pleasing surface, whereas a heavier grade of glass bead will produce a shot peened/rippled effect which is good for stress relieving on metals etc.

Bespoke machinery for blast cleaning

Within different industries, the specification of machines can differ a lot for blast cleaning of particular parts. Vixen has the technical capacity to create bespoke machinery, specifically tailored to a variety of customer requirements. Bespoke builds for Vixen are a



significant part of the business model and it is not unusual for it to undertake complete cleaning lines or bespoke/automated washing and wetblasting machinery.

Whether the application requires small alterations to a standard machine or a full turnkey CAD drawing proposal, Vixen can provide completely bespoke and unique products tailored to a customer's individual needs. Vixens growth in export sales is due to its ability to communicate knowledgeably with international customers through its distributors and dedicated export manager.

Blast cleaning worldwide

Vixen offers first class worldwide customer service, with a team of engineers that commissions new machinery globally, and is able to offer servicing of machinery and repairs of machines in the UK and abroad, ensuring you receive the highest level of customer service. Once a machine is purchased, an extensively trained aftersales team with expert knowledge handle the account, solving any problems or queries regarding media, spare parts and technical operations.

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BLAST CLEANING

As cold as ice

Dry ice blasting is a relatively new cleaning process, used primarily in industrial applications. It is an environmentally friendly process that can clean a wide variety of components very effectively without the use of chemicals or abrasion.

It does this by using small pellets of solid carbon dioxide (commonly known as dry ice) propelled by compressed air at the high velocity of 150 m/sec (492 ft/s) through a hand-held lance to impact and clean the surface quickly and thoroughly.

Dry ice blasters are ideal for effortlessly removing adhesives, waxes, binding and parting agents, silicone and rubber residue, paints and lacquers, ink and graffiti, oils and greases, tar and bitumen.

TDC Services continuously keeps up to date with the latest advances of dry ice blasting and maintains a fleet and product range at the forefront of the technology.

The ice blasters in the TDC fleet are designed to work continuously without freezing, a problem that has previously beset some of other ice blasters. During the many trials that TDC have carried out with its fleet of machines the products selected have proven effective in alleviating this problem.

The principle of dry ice blasting using the TDC services range of ice blasters is very similar to sand blasting. However, there is no clean up at the end as the dry ice evaporates after impact.

Reduced downtime

With dry ice cleaning, there is no more disassembly or removal of equipment it can





be cleaned in place as there are no harmful gases or grit to get in the machinery. Also, as there is no need to allow the machine to cool down, production is only interrupted for the minimum length of time.

Eliminating equipment damage

Dry ice blasting does not erode, wear or scratch the surface being cleaned. It is even





safe to use on surfaces such as glass, plastic and printed circuit boards. Also, because the equipment stays in place, no damage can occur from its removal.

No more solvent cleaning

Dry ice cleaning gives such good results that there is no need to use solvents or chemicals. Consequently, there are no toxic or hazardous wastes to handle or need to worry about complying with the related environmental regulations.

Ice Blaster Part of TDC Services Tel: 01244 534521 Email: sales@ice-blaster.co.uk www.ice-blaster.co.uk

Process optimisation with aluminum melting furnace

In 2016, the prototype of an optimised aluminum smelting system was realised as part of a Federal Ministry of Economics and Technology (BMWi)-funded cooperative project between the industrial and business communities. The EDUSAL II project makes it possible to determine the energy-saving potential of the smelting process whilst at the same time minimising the resulting smelting loss.



"Burner air preheating not only saves on operating and energy costs, it also makes it possible to use the valuable resource of gas sparingly. The efficiency of the entire system will be increased and pollutant emissions will decrease." explains Sven-Olaf Sauke, head of R&D at ZPF

In order to further reduce the consumption values of such a system and thus to increase both energy efficiency and resource conservation, the smelting furnace manufacturer, ZPF GmbH has now extended its concept with additional components. By incorporating a so-called burner air preheating, in which the warm exhaust gas volume flow is passed through a pipe system to a heat exchanger, the system operator has more room for manoeuvre, with lower pollutant emissions and lower gas consumption. This new system can, with appropriate adjustments, be used as a retrofit kit for existing ZPF melting systems.

Sven-Olaf Sauke, head of R&D at ZPF, says: "In last year's project, numerous sustainable improvements, that have optimised the previous furnace system, were achieved. The main focus was on the further development of the measurement technology to a sensory detection of the melting shaft, which means that in laboratory operation both the position of the residual material on the smelting link and its quantity can be precisely determined. In addition, a special evaluation algorithm has been developed that has improved the process to the point that an increase in smelting efficiency of up to 15 percent can be achieved."

Another focus of the EDUSAL II system was the testing of burner air preheating. The idea of integrating a burner air preheating, which efficiently uses the heat flow of the system, has been around for a long time. However, since solutions with partly utopian characteristics and promises are offered on the market, an electrical preheating was initially installed. This allows a very precise energy and thus also profitability balance of the measure. The characteristic values obtained were used to design a burner air preheating from the exhaust gas stream of the smelting system.

Sven-Olaf Sauke says: "With this version, the already heated exhaust gas flow is directed to a heat exchanger via a suitable pipe system."

Ingenious system enables careful handling of gas

The primary air side, the hot gas side, which is prefixed to the heat exchanger, requires

additional components: for example, a control unit that directs the exhaust gas flow to the heat exchanger according to the requirement, and additional measuring points that ensure safe process management. In the event of failure of the heat exchanger or any of the components, the control unit must direct the exhaust flow through a bypass function, past the heat exchanger, directly into the secondary system to protect the heat exchanger and its components. In the heat exchanger, the energy is released to the secondary air side, burner air, the cooled exhaust gas is discharged in the other system either directly into the atmosphere or for preheating the melting material in a corresponding chamber.

The burner air fan conveys cold burner air from the environment into the heat exchanger, which is heated there in the ZPF smelting systems to about 200° C. The pipe system, after the heat exchanger is insulated and equipped with appropriate butterfly valves, measures instruments and displays. An air collector installed directly after the heat exchanger helps distribute the heated medium evenly across the piping to the entire burner system. Thus, the flame temperature increases significantly, resulting in a higher energy input and lower gas consumption.

Sven-Olaf Sauke says: "In this way, not



In burner air preheating by means of a heat exchanger, the warm exhaust gas volume flow is directed via a suitable pipe system to a heat exchanger. This saves efficiently on gas consumption



This furnace is the electrical version, without heat exchanger. For cost reasons, however, the variant with heat exchanger is recommended

only are operating and energy costs reduced, it also allows for a careful handling of the valuable resource of gas. The efficiency of the entire system is increased and the pollutant emissions are reduced." This heat exchanger variant is suitable for all ZPF gas-fired aluminum smelting and heating furnaces, which have a connected load of more than 300 kW and a high smelting ratio over the entire operating time of the furnace. However, the specified limit temperatures for the refractory lining of the kilns must be strictly adhered to.

Burner air preheating by means of heat exchanger as retrofit kit for existing melting systems

The extension of the energy-efficient burner air preheating with an integrated heat exchanger can also be carried out with an existing smelting system but requires some changes.

Sven-Olaf Sauke says: "When upgrading existing ZPF systems, in addition to the heat exchanger, a hot gas withdrawal point, suitable piping and temperature-resistant control and butterfly valves must be integrated. The adjustments with regard to the control as well as the user interface must also be observed." All electrically operated components, for example the control valves and the measuring technology, are integrated in the control and in the control cabinet in order to simplify the operation of the system.

All modifications and retrofits of the system are carried out by ZPF directly at the customer's premises. Prior to this, a comprehensive inventory, consultative discussions and an in-depth conception will take place.

Sven-Olaf Sauke concludes: "The need for pipes, routes and insulation material must be calculated on a project-specific basis. The advantage of the developed system lies in the fact that all components are installed directly at the plant and thus no further space requirement arises in the smelting system."

In addition, ZPF is working intensively on further measures to improve the efficiency of the aluminum smelting systems.

ZPF GmbH is based on its unique vision that combines the efficient use of both energy and space. The company's founder Stefan Fruh accumulated decades of experience in the construction of furnaces and that helped transform his vision into a highly innovative furnace system. He laid the foundations for a company in 1993 together with his son-in-law Klaus Zepek. They called it ZPF. The company is owned today by Professor Dr.-Ing. Hubertus Semrau and Norbert Feth. As managing partners, it is they who lead and continue to develop the company's vision and pioneering work in the building of melting furnaces.

A vision becomes reality

ZPF's success story began with the development of the innovative "reverse" closed furnace system in which, contrary to the natural inclination, hot gases are guided not from the bottom to the top, but from the top to the bottom. This means that the hot gases move much slower and therefore spend much longer in the interior of the furnace. This is what makes the ZPF furnace system famously energy-efficient and guarantees eco-friendly performance without the need for additional exhaust filter systems.

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HEAT TREATMENT

Customised crucibles and foundry products for demanding melting applications

A global specialist in crucible and foundry solutions has developed new extra-large crucibles for aluminium casters, to hold very high volumes of molten metal.

The Molten Metal Systems (MMS) business of Morgan Advanced Materials has successfully developed extra-large ISO-pressed crucibles, with a capacity to hold up to three metric tonnes of molten metal. Morgan can also enhance crucible sizes to hold between six and ten metric tonnes of molten metals for specific melting requirements. This development has been made possible using one of the world's largest Cold Iso-static Presses (CIP) and more than a century of expertise in material science and application engineering.

A similar breakthrough has been made with Heat Treatment Containers (HTCs), with Morgan having successfully developed new customised HTCs for specific high temperature sintering applications. By evolving its capability to produce HTCs according to individual design requirements, Morgan is providing multiple benefits to customers including longer container lifecycles, improved productivity, and fewer rejections. Customised containers can also bring energy savings made possible through reduced kiln temperature settings.

Mirco Pavoni, global technology director of Molten Metal Systems at Morgan Advanced Materials, says that the company's enhanced range of crucibles and HTCs is already being well received by the global market:

"The development of our latest crucibles and foundry products is a result of more than 100 years of experience in non-ferrous metal melting and holding applications. Using the knowledge and experience within this business, we are uniquely positioned to engineer high performance raw material mixes, which result in excellent heat transfer and high erosion resistance properties, with considerably enhanced dimensional capabilities. This enables us to react very quickly to market changes, allowing us to continue to create value for our customers through superior material science, advanced application engineering, and a thorough understanding of customer needs."

Shortened production times for investment casting of turbine engine blades with proprietary leachable material

Investment casting businesses can benefit from significantly shorter leaching cycles for core support rods used in the production of turbine engine blades, following the development of a new range of materials which has been specifically optimised for this purpose, over quartz or alumina alternatives.

Developed by Morgan Advanced Materials, the LEMA[™] range of proprietary alumina-based materials will play a vital role in maximising throughput and capacity for turbine blade manufacturers. While typical alumina rods are renowned for their strength and load bearing capabilities, it can take several days to fully leach the materials, resulting in delays within the production process.

At a time when demand for turbine engine blades is expected to grow substantially over the next few years, based on the ramping



build schedules of new engine programs such as CFM's LEAP engine and Pratt and Whitney's PurePower™ PW1000G family of engines, the enhanced leachability of LEMA rods shortens processing times significantly, allowing manufacturers to produce more components.

The improved leachability of LEMA compared with alumina, for which the leaching process is typically more challenging, can drive cost and time savings by improving first pass yields. Moreover, it can be used with less aggressive and more user-friendly leaching solutions, helping to overcome the cost and health & safety constraints associated with the use of more aggressive substances.

While quartz offers a cost-effective alternative to alumina in terms of leachability, it lacks the strength of alumina, making it less suitable for applications where part geometries and alloys require higher strength support rods. LEMA components are approximately 1.5 times stronger than quartz equivalents, resulting in higher quality castings with fewer defects.

Morgan Advanced Materials is a global materials engineering company which designs and manufactures a wide range of high specification products with extraordinary properties, across multiple sectors and geographies.

From an extensive range of advanced materials, it produces components, assemblies and systems that deliver significantly enhanced performance for its customers' products and processes. Its engineered solutions are produced to very high tolerances and many are designed for use in extreme environments.

The company thrives on breakthrough innovation. Its materials scientists and applications engineers work in close collaboration with customers to create outstanding, highly differentiated products that perform more efficiently, more reliably and for longer.

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Alloy Heat Treatment receives Nadcap re-accreditation for heat treatment

To demonstrate its continued commitment to quality, specialists in alloy and aluminium heat treatment Alloy Heat Treatment has announced its success in achieving Nadcap re-accreditation for heat treatment.

The aim of the Nadcap program is to assess process capability for compliance to industry standards and customer requirements. Nadcap is an industrymanaged approach to conformity assessment that brings together technical experts from both industry and the Government to establish requirements for accreditation, accredit suppliers and define operational program requirements. This results in a standardised approach to quality assurance and, by achieving Nadcap accreditation, Alloy Heat Treatment has demonstrated its compliance.

Quality manager Steve Roberts states: "I'm delighted with the achievement of Nadcap re-accreditation and to again be awarded Merit Status. This means that, instead of having our next Nadcap audit in twelve months, we have been granted an accreditation that lasts until January 2020."

Joe Pinto, executive vice president and chief operating officer at the performance review institute, says: "Compliance via Nadcap accreditation is a milestone in demonstrating manufacturing excellence. By obtaining Nadcap in heat treating, Alloy Heat Treatment have proved to the industry that they are committed to quality and aerospace safety.

Alloy Heat Treatment, is the UK's first and only specialist in the heat treatment of aluminium alloys. With nearly 40 years' experience as a subcontractor focused solely on the heat treatment of aluminium alloys, it is the preferred destination for companies within all sectors of the light metal industry.

Founded in 1974, it has on-site specialists who can give advice on materials, treatments and surface engineering, preferably at the design stage.

Alloy Heat Treatment prides itself on its



personal relationships with customers. Through training and development of staff at all levels it is dedicated to providing the very best service for all heat treatment requirements.

The organisation holds NADCAP, AS 9100 accreditation and preferred supplier status to many aerospace primes.

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AMETEK Land is on the SPOT with range of non-contact thermometers

Towards the end of last year, AMETEK Land introduced SPOT, its fixed non-contact pyrometer that is designed with advanced integrated processing capabilities to make temperature measurement accurate, flexible and easy to use.

Richard Gagg, industry manager for metals at AMETEK Land, says: "The SPOT features the latest temperature measurement technology to ensure that heat treatment companies remain one step ahead of their competition by continuously optimising quality and output."

SPOT model variants allow users to select thermometer type, temperature range, spectral response and optical characteristics to suit applications from 50 to 1,800 °C/ 122 to 3,272 °F. For heat treaters requiring temperature measurement at induction hardening, carburising, plasma nitriding and CAL line positions, there are multi-wave length 'R' models, single wavelength 'M' models and 'FO' fibre-optic models, with small optic heads that allow access into the most difficult measure locations, are available. As everything is built into the SPOT thermometer, it is a truly stand-alone solution that requires no separate processor. SPOT can be powered by either 24-30 V DC or Power-over-Ethernet. Its rear display and controls allow target viewing, temperature reading and setup through simple, menu-driven choices.

One of the major advantages of SPOT is its outstanding target alignment. It features a thru-the-lens integrated camera with auto brightness and patented, pulsed green LED to make measurement alignment much simpler on hot targets. SPOT also has a durable sapphire protection window that resists scratches and solvents and is easily cleaned with a soft cloth.

Users also benefit from SPOT Viewer Software, a Windows-based utility add-on, which allows the user to connect, configure and view data from a SPOT thermometer. The SPOT Viewer Software communicates with the instrument using Modbus TCP communications. It can be installed on a Windows-based PC and allows the user to configure, display and log data.



The technology can be configured locally via a simple, menu-driven interface. SPOT contains a web server allowing remote setup and viewing from any standard web browser.

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New modular controls enhance the process safety of mass finishing applications

At the Euroguss exhibition, Walther Trowal presented a mass finishing system for the finishing of castings equipped with a brand-new control panel. This allows fully automatic finishing operations in the rotary vibrators of the model range CB, especially with interlinked systems. It helps not only to minimise manual process control but also increases the overall process safety.

For the suppliers of mass finishing equipment, so-called "cup-shaped" castings can pose major challenges. Upon completion of the finishing cycle, such workpieces, for example battery housings, can contain a certain amount of processing media, which might be carried out of the machine with the workpieces. This can pose serious problems with downstream manufacturing operations.



This is one of the reasons, why Walther Trowal developed the SZ-Plus control panel for the CB model range, which was introduced to the public at the Euroguss exhibition last month. It covers the entire surface finishing process, including automation stages like workpiece loading, the finishing step itself, discharging of the



finished parts from the machine, workpiece drying and workpiece transport before and after the finishing step.

One major feature of the new control system is that, compared to the actual finishing step, a higher vibratory amplitude can be programmed for the screening step, i.e. the separation of the finished workpieces from the media. This greatly facilitates the removal of media, which might have been carried out of the finishing machine by cup-shaped workpieces.

The new control system helps automate finishing processes and eliminates many manual operations like, for example, the manual adjustment of the machine settings. In the program library, the processing parameters can be easily selected for a wide variety of different customer workpieces.

The new panel controls not only the timing of the different process stages but also ensures that compound and water are injected into the machine at the precise required quantities. This helps prevent operator errors and ensures absolutely constant and high finishing qualities.

The CB rotary vibrators allow the processing of castings with dimensions of up to 380 mm (15"). Of course, they can also be used for finishing other high value workpieces that are processed in multi-stage processes with grinding and polishing pastes. This includes so-called "Trowapast" processes, which are employed for stainless steel workpieces and even, components made from ceramic.

At the Euroguss exhibition Walther Trowal presented the new SZ-Plus control panel on a CB rotary vibrator linked with a vibratory drier and a centrifuge for cleaning and recycling of the process water.

For 85 years, Walther Trowal has been a pioneer and a leading company in various surface treatment technologies. The company offers modular and custom engineered solutions for a wide range of surface treatment problems.

Initially only making vibratory finishing equipment, over the years Walther Trowal has continuously broadened its product range and today offers a wide portfolio of equipment and services for improving all kinds of surfaces, for example mass



finishing, part cleaning, shot blasting and drying of a wide spectrum of workpieces and, last but not least, the coating of mass produced small parts.

Walther Trowal offers not only various types of equipment but complete surface treatment systems. By linking the various equipment modules and automating the complete process, it is able to precisely adapt its process technologies to the technical requirements of its customers. This also includes various types of peripheral equipment and process water cleaning and recycling systems. Of course, it also offers comprehensive pre- and after-sale service like sample processing in one of its demonstration labs and global repair and maintenance service.

Walther Trowal serves many customers in many industries around the world, for example, in the automotive and aerospace industry, medical engineering and wind power generation.

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Metal finishing expert invests £300 k in open casting impregnation facility

The owners of Stourbridge-based metal finishing specialist Midland Deburr & Finish have invested £300 k to open a new company, Midland Impregnations Ltd (MIL). A further £50 k will be invested in the near future to increase impregnation capacity and other associated processes.

After spotting a gap in the market, MIL was formed to provide a specialist casting impregnation service to foundries and casting machine shops predominantly across the Midlands region.

MIL director Chris Arrowsmith explains: "When you make a casting, you can get micro or macro porosity. This will cause the casting to leak and potentially fail in operation. A lot of companies will pressure test their castings and if they leak, they can be sent out for impregnation. Essentially what we are doing is sealing the porosity within the castings. Some companies like to send a large quantity out to be impregnated, others prefer to pressure test and send us the 'leakers'. Within the automotive component industry in particular, we felt that there was a gap in the market for the specialised impregnation of castings."

Along with co-director Paul Young, Chris Arrowsmith identified an opportunity to improve the impregnation process. Around £20 k was invested in a specialised oven to dehydrate castings prior to impregnation. Chris Arrowsmith adds: "The dehydration is necessary to remove contamination, including machining fluids from within porosity in preparation for effective impregnation. We also have a solvent degreasing facility utilising ultrasonics to remove oil or other contaminations from within porosity if required. We have combined experience in this field of over 35 years and wanted to add this engineering expertise to our process."

Vacuum and pressure impregnation is carried out through high capacity equipment that can process both small and large castings in both the as-cast and machined condition. The inclusion of high performance rotational spray/flood washing ensures high standards of cleanliness on complex finish machined castings during the impregnation process.

The largest basket can accommodate loads up to a tonne in weight and the process can handle components in both the "as cast" and machined condition. It Is suitable for impregnating ferrous and non-ferrous castings and uses internationally approved sealants with high levels of sealing performance and cleanliness. Processes are designed to avoid component damage and sealant contamination in blind holes. There is a fast turnround service within 24 hours and transport, delivery and collections are available.

Chris Arrowsmith concludes: "Our target markets are casting companies and companies that machine castings. We have seen high levels of demand since the launch of MIL ranging from requests for large volume work down to one-offs."

Both companies are approved to ISO 9001 and ISO 14001. Midland Deburr and Finish Ltd was established in 1999 to provide a cost-effective solution for companies wanting to outsource their "dirty" processes i.e. component degreasing, deburring, mechanical finishing and general surface improvement.

Through continuous investment in process capacity and improvement in quality systems, it is now able to successfully serve



a wide range of customers, large and small, in a wide range of market sectors including automotive, aerospace and Formula One.

Midland Deburr and Finish Ltd Tel: 01384 891198 Email: sales@midlanddeburrandfinish.co.uk www.midlanddeburrandfinish.co.uk



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Simplifying corrosion protection for grinders and finishers

Flash corrosion is an undying foe for metal finishers. It especially likes to attack just when metal surfaces are at their finest: freshly ground, polished, and cleaned. A common protection strategy is to dip rust-prone parts into oily rust preventatives immediately after machining or cleaning. This prevents corrosion while parts await the next stage of processing, such as quality inspection. A typical routine for the QC team would be to clean the parts, inspect them, and dip them in rust preventative again before sending them off to the shipping department. While this method is effective, it becomes more time consuming the more parts there are. Each additional step slows the manufacturing process, requiring extra labour time and creating additional costs for the disposal of hazardous oil-based rust preventatives.

Applying flash corrosion inhibitors during cleaning

A variety of solutions to streamline the manufacturing and corrosion prevention process has been developed by US-based corrosion inhibitor manufacturer Cortec Corporation, a global leader in VpCI technology. Rather than requiring two separate steps for cleaning and corrosion protection, Cortec has developed several alkaline washes in its VpCI-400 series that contain flash corrosion inhibitors. These flash corrosion inhibitors allow the cleaned parts to sit in the open air corrosion-free for one or two days. Unlike a traditional rust preventative, the flash inhibitors do not need to be removed before further processing or use of the parts. Depending on the workflow, this can allow enough time



for quality inspection or transport to the next stage in the manufacturing process.

When metal parts are cleaned in parts washers where foaming can be a problem because of agitation, a low foaming cleaner such as VpCI-418 LM should be used. This is a heavy duty alkaline cleaner that can be diluted for cost effectiveness. In addition to containing flash corrosion inhibitors and

minimising foaming, VpCI-418 LM is also much safer than trichloroethylene, a common cleaning agent used to remove oily rust preventatives.

Dry corrosion protection in temporary storage

If metal parts are left exposed for more than two days, another option is to use special corrosion inhibiting papers and films to wrap parts or line the bins in which they are temporarily stored. Papers such as VpCI-146 and plastic film such as VpCI-126 rely on vapour-phase corrosion inhibitors coated on the paper or embedded in the film to create a corrosion inhibiting environment within an enclosed space. VpCI-130 series foam or BioPads provide additional protection if needed for larger areas. As the corrosion inhibitors vapourise off the paper or out of the film or foam, they fill the enclosed space and adsorb on metal surfaces. This protective molecular layer is invisible and keeps the metal from interacting with corrosive elements such as moisture, air, or chlorides. While the metals are enclosed in the VpCI packaging, they are protected. When they are needed for inspection or rework, they can be taken out of the packaging and directly worked on without the additional cleaning that would be needed for an oily rust preventative.

Reducing cleanup with dry film rust preventatives

Rust preventatives are still a viable option for extended periods of protection because they leave a protective coating that stays on the metal whether or not it is enclosed in packaging. The use of dry film RPs can be



very advantageous over oily rust preventatives because they create less mess and minimise or eliminate the hassle of rust preventative removal and disposal.

VpCI-377 is a water-based concentrate that can be diluted and applied by dipping or spraying, or by metering into parts washers and rinse tanks. It dries into a clear



hydrophobic film that often does not need to be removed and can even be painted over. If desired, the film can easily be removed by rinsing with water or an alkaline cleaner in place of a petroleum solvent cleaner.

VpCI-277 is a solvent-based, ready-to-use version of VpCI-377 that was specially developed to meet the specs of a major automotive company. It is ideal for use on precision components with tight tolerances.

Cortec Corporation Tel: 001 651429 1100 Email: productinfo@cortecvci.com www.cortecvci.com

Bodycote Swedish site earns Nadcap HIP accreditation

Surahammar facility achieves important aerospace certification

Bodycote, the world's largest provider of heat treatment and specialist thermal processing services, has announced that its Surahammar, Sweden Hot Isostatic Pressing (HIP) location has earned its Nadcap accreditation.

The Surahammar site has been producing Powdermet® Near Net Shape (NNS) and Selective Surface Net Shape (SSNS) components for many years, using its long experience of manufacturing complex, high integrity components from powder metal to serve markets such subsea, oil and gas, marine, nuclear, tool steel and automotive.

Bodycote HIP now has nine Nadcapaccredited sites globally positioned to serve the world's aerospace prime manufacturers and their first-tier suppliers with additional HIP capacity to meet the demands of the future growth in the new aircraft programmes over the coming years.

Bodycote HIP serves clients globally operating in markets as diverse as medical, power generation, marine and electronics, with both HIP services and Powdermet technologies. The recently launched Powdermet technologies incorporate new, patent-pending techniques that combine 3D printing with well-established net shape and NNS techniques. This new technology dramatically reduces the manufacturing time and production cost of a part compared to producing the same part using 3D printing alone.

Bodycote operates with the world's largest network of HIP equipment and continues to invest, recognising the growing demand for HIP technology. Having established industry expertise over decades, Bodycote has more than 50 HIP vessels of varying sizes in multiple locations. Processing capability can accommodate components which are nominally up to 2 m diameter by 3.5 m high and weighing 0.1 kg to over 30,000 kg. In addition to standard quality and environmental accreditations, Bodycote's HIP facilities also hold ASTM and NORSOK accreditations.

With more than 180 accredited facilities in 23 countries, Bodycote is the world's largest



provider of heat treating and specialist thermal processing services. Through classical heat treatment and specialist technologies including Hot Isostatic Pressing (HIP), Bodycote improves the properties of metals and alloys, extending the life of vital components for a wide range of industries, including aerospace, defence, automotive, power generation, oil & gas, construction, medical and transportation.

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ERIKS calls for hands-on approach to new PPE gloves regulations

Industrial solutions provider, ERIKS UK & Ireland has welcomed the new regulations for PPE gloves and is calling on industry to familiarise themselves with the changes to ensure PPE gloves are fit-for-purpose. The PPE Directive 89/686/EEC, which has been in place since 1989, is set to be replaced on 21st April 2018 by Regulation (EU) 2016/425. The updated regulations will include a number of important changes including definitions, markings and test methods, reflecting the latest technology and materials used in glove design and manufacture, all designed to help mitigate the risks of working in specific environments.

Regulation (EU) 2016/425 covers a new measure of cut resistance under EN388, mechanical protection, as well as changes to the testing of chemical protective gloves under EN374. New markings for chemical gloves are also included, which clearly define type A, B, and C protection levels.

Type A gloves offer protection of 30 minutes minimum breakthrough time for at least six defined chemicals, with Type B offering the same breakthrough time, but for only three defined chemicals and Type C offering just 10 minutes breakthrough time for a single chemical.

A broad range of PPE gloves is available for mechanical and chemical protection and the new requirements offer the opportunity for PPE users to more closely match specific gloves to individual applications. For example, with mechanical applications there is a new cut test which ensures that the glove material can't blunt the test blade, offering superior protection for machine operators.

Paul Skade, category manager for the tools, safety & maintenance product business unit at ERIKS UK & Ireland, says: "With health and safety taking a leading role in any business, ensuring you have the right gloves for an application will make a job safer and quicker. Although any changes to regulations can cause confusion, the updates to the PPE Directive will actually make it easier to identify and choose the right gloves for an application to ensure worker protection.



"PPE gloves have improved dramatically in recent years, with the use of more technical fibres making them even more effective in providing protection, particularly against mechanical hazards like abrasion, blade cuts, puncturing and tearing. It's only right then, that regulations are adapted in line with these improvements.

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