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FEBRUARY 2019

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The new STUDER favorit

STUDER is expanding its product portfolio and bringing a new machine series to the market – the favorit. With centre distances of 400, 650, 1,000 and 1,600 mm, the favorit line is suitable for short to long workpieces and can be used universally. It comes in a completely new design and scores especially with its price-performance ratio.

This CNC universal cylindrical grinding machine is designed for grinding in individual and batch production and can be automated. It can subsequently be easily adapted to other grinding tasks using various accessory kits such as in-process gauging, balancing system, contact detection and length positioning.

The favorit is a very cost-effective machine. As with all STUDER cylindrical grinding machines, the proven solid Granitan® machine base ensures the highest precision, performance and reliability. The full enclosure ensures an optimal view of the grinding process. The wheelhead, which can be automatically positioned every 3°, can take one belt-driven external and internal grinding spindle respectively.

Thanks to a 370 mm long X-axis the dressing spindle can be placed behind the workhead or tailstock, without colliding with the grinding head. Geometrical clarifications are now a thing of the past. The dresser position can be manually adjusted in the T-slot.

The STUDER favorit has an integrated coolant tray and a machine base with temperature control. Potential deformations of the slide on the Z-axis are eliminated. At the same time the "active temperature control" option brings the machine to operating temperature faster.

The practical STUDER grinding software with its proven StuderPictogramming means that even less experienced users can quickly and practically program grinding and dressing cycles. The modern and user-friendly design is complemented with a touch-screen panel, which allows the operator to easily and directly control the machine. Service doors at the rear and on the right of the machine ensure high ergonomic efficiency during machine operation. Development, production, assembly and inspections of STUDER products all takes place in a process-oriented manner and complies with the stringent directives stipulated in VDA 6.4 and ISO 9001.

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The summit of precision

The UNITED GRINDING Group is holding its Grinding Symposium in Thun, Switzerland for the fourth time in May.

The international specialist in precision machining as well as leading experts from science and manufacturing industry will be meeting to exchange views.

"We look forward to being able to offer our guests a forum for international professional exchange with the Grinding Symposium." says CEO Stephan Nell.

With a turnover of around €700 million, the UNITED GRINDING Group is one of the world's leading manufacturers of precision machines for grinding, eroding, lasering, measuring and combination machining.

With its company brands MÄGERLE, BLOHM, JUNG, STUDER, SCHAUDT, MIKROSA, WALTER and EWAG, UNITED GRINDING offers a broad application knowledge and an extensive product portfolio for surface and profile grinding, cylindrical grinding and tool machining.

Trends in precision machining will be presented at the Grinding Symposium, which will be held in the midst of the Bernese Alps

Presentations and lectures

The eight company brands will present their new technologies at the Symposium. The spectrum ranges from a grinding machine for extra long workpieces to a highly productive automation solution, as well as an efficiency-optimised dressing technology.

With the so-called FutureLAB, digital solutions for the production of tomorrow and beyond will also be presented.

In a total of 16 lectures, experts from science and practice will report on trends in the manufacturing industry in general and precision machining in particular.

Themes of digitalisation will also be discussed, such as artificial intelligence or the use of sensors in the production process. In addition to these events the Symposium will focus on discussions and meetings between industry experts and participants. 2,000 guests a day are expected to attend.

Customers of the UNITED GRINDING Group and interested parties from the precision machining sector are invited.

"Come and be inspired. I look forward to welcoming you to Thun in May 2019." says Stephan Nell.

In a total of 16 lectures, experts from science and practice will report on trends in the manufacturing industry in general and precision machining in particular

REGISTER NOW:
Grinding Symposium 2019
The Grinding Symposium of the UNITED GRINDING Group will take place from 8 -10 May 2019 in Thun, Switzerland.

Further information and a link to the registration page can be found at:
www.grinding-symposium.com

REGISTER NOW

Welcome ...

… to the world of precision machining at the **Grinding Symposium 2019** in Thun, Switzerland.

On an area of over 4.000 m^2, the UNITED GRINDING Group will present the latest developments in grinding and precision machining. Find out about these in exclusive lectures and a special exhibition on developments in the manufacturing industry of tomorrow and make the most of the exciting evening events for your personal networking.

Register now at www.grinding-symposium.com

UNITED GRINDING

Precision flies

by Claudio Tacchella

The aeronautical and aerospace sector has in AZ SpA a technological partner able to propose numerous specific grinding solutions with high innovative content. In the range of grinders designed by AZ, the new LBC777 line for the orbital machining of landing gear is a recent and very successful example.

The aerospace sector is in continuous technological evolution and seems not to know crisis. Direct, indirect EOM and certified aerospace subcontractors always research and develop innovations for all components and processing processes used, for example, new "hyper-special" materials such as inconel, high-alloy steels, super alloys with base of cobalt and nickel, titanium etc. Aerospace also means working on very expensive single pieces and following strict production procedures with special work cycles that guarantee their traceability and above all "zero defect" on the final pieces. For machine tool suppliers, and in particular for finishing machines such as grinding machines, no mistakes are allowed.

In this context, among the manufacturers of cylindrical grinding machines accredited for aerospace, the Italian AZ SpA of Thiene (VI) has been able to gain a worldwide leadership success thanks to the high quality and performance levels of its products. This is the result of high professionalism and engineering creativity able to grasp and often anticipate market demands. AZ has an impressive range of grinding solutions designed specifically for the aerospace industry called "AZ Aerospace" for the manufacture and maintenance of components of aircraft engines and landing gear.

AZ grinding machines are all customisable, energy efficient, safe, reliable and comply with Industry 4.0 requirements. The numerous lines available are developed with the range AKP for landing gear grinding machines with gap bed, GSB for internal landing gear grinding machines, RU and RUG for universal grinding machines for external and internal diameters and LBC for landing gear orbital grinding machines for external and internal diameters.

In particular, the new LBC777 represents a recent example of a solution for asymmetrical heavy parts with rotating table. One of these grinding centres is successfully used for all Boeing series with others for alternative brands of landing gear. A new self-balancing orbital grinding system and rotary table facilitates the grinding of the heavy-duty landing gears without displacement of the workpiece. In fact, the rotary table allows the grinding of

Watch the AZ video of an example of the grinding cycle on LBC777

The new LBC777 line for the orbital machining of landing gear propose numerous specific grinding solutions with high innovative content

Above & below: In a single grinding machine, the orbital grinding of external and internal diameters is performed without moving the workpiece

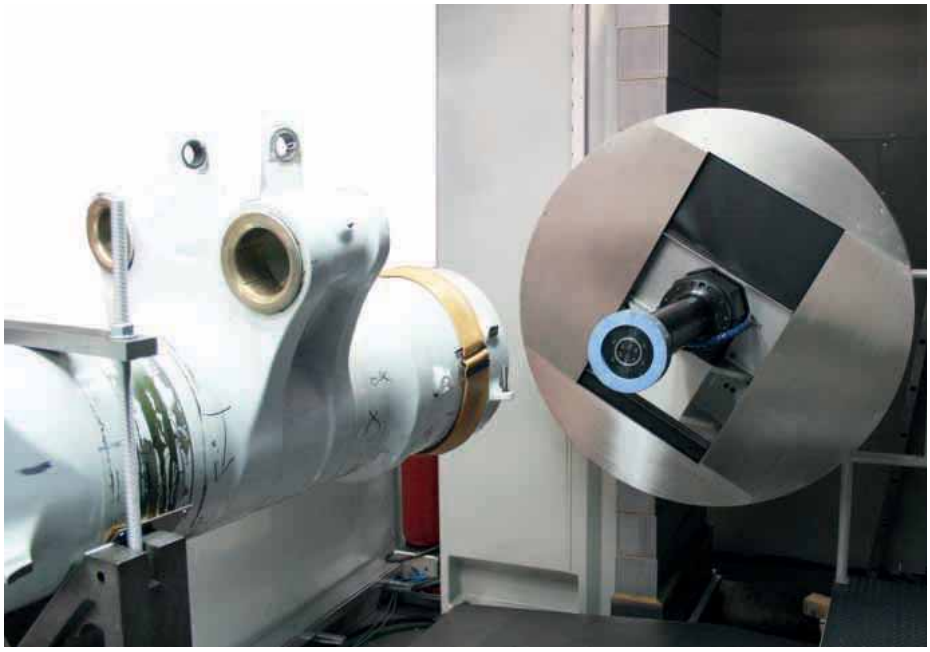
external and internal diameters in a single piece grip and is moved by the overlapped and crossed arrangement of the main machining axes, Z and X, which allows ample operating capacity with reduced dimensions on the ground. The machine axes slide on high precision recirculating linear guides. The machine base has been designed with FEM analysis and is made with a special "Composital" technology structure that reduces the elasticity coefficient, guaranteeing an exceptional absorption of vibrations, great machine rigidity, stiffness and high dynamic performance.

The LBC777 wheelhead is configured with two spindles for internal grinding and one spindle for external grinding. The wheelhead, mounted on a rigid structure, is equipped with an AZ system for self-balancing and runs vertically in the Y-axis, on sliding guides with anti-friction material "Turcite" equipped with automatic lubrication.

The grinding machine is characterised by the particular processing cycle that takes place through the orbital grinding of the workpiece surface. On the stationary piece and positioned by the rotating table, the grinding wheel used follows the geometric trajectory of the piece along its generating line both for grinding external and internal diameters. With this axis scheme, the machine allows an internal grinding capacity from 70 up to 900 mm, an external grinding capacity from 10 up to 450 mm and a tangential grinding capacity of 2,000 x 850 x 1,500 mm.

The rotary table is moved by the overlapped and crossed arrangement of the main machining axes, Z and X, which allows ample operating capacity with reduced dimensions on the ground

Silicon carbide, corundum, CBN and diamond grinding wheels allow grinding all aerospace materials, metals and their alloys including chromium and, in particular, those subjected to the most innovative systems for thermal spray techniques, such us H.V.O.F. (High Velocity Oxygen Fuel). The grinding process has some functions to give to the operator few automatic and safe working cycle: electronically variable spindle speed, GAP control, dressing control, CRASH control and control of orbital diameters from CNC. This offers the machine the possibility to reach unbelievable performance on accuracy. In addition, Wikicam is a monitoring system that allows to control remotely some parameters of the CNC machine. There is also a built-in live video streaming solution to monitor what the machine is doing in real-time. The connection to the builder's headquarters is made by a high-strength secure encryption algorithm, using a VPN.



The wheelhead is equipped with an AZ system for self-balancing and runs vertically, Y-axis, on sliding guides with "Turcite" anti-friction material

The grinding machines produced by AZ use the most advanced mechatronic solutions. Measurement systems, motors, drives, as well as machine mechanisms and applied CNCs, are selected among the best brands in the world. With over 40 years of experience in the sector and more than 3,000 grinding machines delivered and operational in more than 80 countries worldwide, AZ has always distinguished itself in tackling and solving technical issues, even with complex shape, proposing customised solutions to individual customer needs. The design creativity of AZ allows the creation of product lines, like the new LBC777, to be among the most sophisticated on the market today.

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Economically and environmentally efficient surface cleaning with maximum performance

The aerospace industry has high requirements when it comes to the cleanliness of parts. Chlorinated solvents are a proven and well-researched solution for clean parts with low surface tension, even with a wide range of contaminants. However, many manufacturers in the recent years have been evaluating alternatives to their established processes, as did Leonardo Helicopters, one of the world's leading helicopter manufacturers, at its site inYeovil (UK). It decided for DOWPER™ MC Perchloroethylene and COMPLEASE™, the chemical leasing model from SAFECHEM. This helps to ensure that the highest requirements to both component cleanliness and health, safety and the environment (HSE) are met. At the same time, the service-oriented leasing model provides process optimisation to reliably produce top products.

Leonardo Helicopters, with its UK home in Yeovil, manages the design, development, test, production, support and sales of the most complete range of rotorcraft available for commercial, public utility, security and defence use.

Being acutely aware of its environmental responsibilities, Leonardo had been using NEU-TRI™ E Trichloroethylene in SAFECHEM's SAFE-TAINER™ Systems for many years in an environmentally responsible manner, with large, non-regenerating carbon abatement systems. This led to annual carbon costs similar to those associated with the supply and disposal of solvent. So, when Trichloroethylene was added to the candidate list of Annex XIV of the REACH legislation in 2010 as a substance of very high concern, leading to formal classification in 2013, Leonardo started to investigate potential alternatives for the solvent that had been the bed rock of aerospace approvals for many years.

Aqueous cleaning systems were widely in use across the Yeovil site having replaced numerous open topped plants over several years. However, for critical applications, particularly cleaning prior to NDT processes, the low surface tension of solvent was felt to be a significant advantage. Solvent options considered were Perchloroethylene (DOWPER MC) and DOWCLENE™* 1601 Modified Alcohols. The CoRAP review of 2014 gave reassurance over the future of Perchloroethylene. All options had not only to comply with the strict aerospace approvals that Leonardo and their customers expected, but they needed to be cost-effective and provide a consistency of results, too.

The system needed to provide a cost effective, repeatable solution without issues of environmental or operator safety. Peter O'Shea, Capital Investment project manager, Transmissions Centre of Excellence confirmed that "processing time, consistent

results and the low surface tension of solvent all were important." German machine manufacturer Höckh came up with an innovative two chamber system that would enable parts to be processed in whichever sized chamber was best suited to particular components. If needed, both could be utilised at the same time, although with slightly extended process time. This so-called Multiclean plant with a filling volume of 2,000 litres was installed at Leonardo's Yeovil site in autumn 2016.

The chemistry option to be used was confirmed to be DOWPER MC Perchloroethylene which has widespread aerospace approvals. Supplies would be via a COMPLEASE Chemical leasing agreement. This enabled Leonardo to access everything that would be needed to ensure smooth running of the process with known monthly cost for any 12-month period. Other than the 2,000 litre first fill, the SAFECHEM experts calculated a greatly reduced volume of solvent needed compared to previous consumption in traditional enclosed plants. To ensure even more certainty for the first years of operation a bath exchange premium was built into the offer, which allowed Leonardo to be secure that in the event of the need for a complete exchange of solvent, the cost for supply of new solvent and disposal of the old material would be covered.

Despite extra work compared to that originally planned, after two years of using DOWPER MC in the Höckh Multisolvent plant, solvent consumption is incredibly low. "We had planned for three fresh SAFE-TAINER Systems, which amounts to 600 litres, to be filled in the first 12 months. But now, two years after the installation, we realised that we have just finished the first 200 litre DOWPER MC. This is extremely pleasing, from both a financial perspective but just as importantly also from an environmental one," confirms Anthony Brown.

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Improved turbine and compressor blade finishing with OTEC

One of the most crucial components of a working engine system is its engine blades, such as turbine or compressor blades. A turbofan engine, for example, has many parts: at the front, the fan draws in the air and directs it into the compressor, which is composed of several blades arranged in a row and decreasing in size towards the end of a narrowing tube. Using a rotational movement, the suction air is compressed to up to a thirtieth of its volume, which in turns compresses and heats the gas. The air is then fed into the combustion chamber where it is mixed with injected kerosene and

A turbine blade pre- and post-processing

burned. The resulting energy propels the high-pressure turbine where the turbine blades driving the compressor are installed. The downstream low-pressure turbine is also set in motion using this energy. The low-pressure turbine consists of longer turbine blades and is directly connected to the fan. The turbine ensures that the fan rotates. The fan not only sucks the air into the interior, but past the compressor and the turbine. The cold air, which is fed past the interior, generates the greatest propulsive force.

The process inside the engine merely ensures that the engine remains running, so the exhaust gas flow produces 20 percent of the propulsion and the fan 80 percent. Both the turbines and compressor blades are subject to high temperatures and pressures. Manufacturers have therefore implemented strict regulations for the production and processing methods used.

The engine blades used in the aerospace industry are usually made of materials that are difficult to machine and have a low tolerance that must be met to obtain the ideal air flow and maximum wear resistance. These components are exposed to extreme temperatures of up to 1,000°C. This means that the blade surface also has to be of the highest quality and optimally adapted to the conditions in the engine. OTEC has developed a special process to improve the efficiency and safety of engine blades and produce fewer defects.

Smoothing the air foil, i.e. the blade body, has a positive impact; depending on the required result, the surface can be smoothed to values of up to Ra < 0.2 µm in a few minutes, increasing blade efficiency. The material is removed evenly and only a minute amount is taken from the surface. Repairing the leading and trailing edges with precision rounding can reduce the quantity of rejected parts. The upstream machining process, for example blasting, can damage these edges. OTEC's method enables them to be rounded to a given radius and hence repaired. The rounding process is very precise and involves minimal material removal.

Deburring the root helps to improve safety by preventing the blade from becoming caught in the disc. Surface treatment not only prolongs the service life of the blades but increases their efficiency. This is also the ideal preparation for coating the components. Smoothing and rounding the engine blades is possible in a single operation thanks to OTEC's innovative stream finishing process.

In the stream finishing process, the blades are clamped into the machine and lowered into a container of abrasive. Processing is carried out by both the rotation of the container and the movement of the workpiece in the media flow. The flow to the blades in the machine is clocked, i.e. the alignment angle of the workpiece changes at frequent intervals. This means processing can be precisely aligned to specific points on the workpiece, achieving a smooth surface and precise rounding without altering the shape of the blade. An important benefit of OTEC's process is the ultrashort machining times compared to conventional processes. Depending on the

Above and below: OTEC finish: for smooth surfaces and rounded parts

size and initial condition of the workpiece, the surface treatment of engine blades takes between two and 20 minutes. As the blades are clamped individually, no damage will occur to the workpiece surface. All processing steps can be carried out in one machine. The SF-5 stream finishing system can process up to five engine blades at once, ensuring high output and cost efficiency. Tests conducted after OTEC processing show positive results for residual stress, fatigue strength and fluorescence control.

The surface treatment of blades from energy turbines can also be carried out in OTEC machines.

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Kemet offers a clean bill of health for aerospace

With 2019 expecting to continue the 2018 worldwide growth within the aerospace industry, OEM's are always looking for more and more efficient and productive ways to develop their value streams.

Kemet, alongside its partner Finnsonic has focused on this sector with its in-process cleaning and FPI technology for over 40 years and has delivered over 500 automated cleaning systems worldwide within that time. The aerospace industry, for obvious reasons, set strict requirements concerning the quality of manufactured components, so the repeatability and performance of all validated processes are key to maintaining this quality.

Finnsonic's Fluorescent Penetrant Inspection lines have been approved in the aviation industry for both manufacturer (OEM) and maintenance, repair and operations (MRO). Complex systems have been supplied to some of the world's largest players and Finnsonic is a licensed GE Aviation supplier.

Most FPI lines will also include ultrasonic cleaning stages prior to the penetrant application so that perfect coverage can be guaranteed. Kemet offers solutions for the most demanding of cleaning applications, basing systems on type of contaminant, capacity requirements, size and type of component, and the available floor space. At its test centre in Maidstone, Kent, it can develop and prove the most effective and efficient cleaning processes for any application.

A recent MRO test at Kemet concerned the removal of dirt and grease from aircraft hydraulic pipes and tubes. The braided pipes supplied for the test were stainless steel and plastic, heavily contaminated with general dirt and grease, but in addition, dried de-icing fluid, and carbon dust. With a 20-minute process using a Finnsonic Mi80 and Kemet's Rodaclean Supra cleaning fluid from Swiss manufacturers NGL, all the braided hoses were perfectly cleaned like new. The test completed at no cost to the customer, giving them confidence and real data that enables them to see in advance how best to incorporate into a future investment programme.

This is the same tried and tested service that Kemet has offered to industry for over 80 years. It's not only ultrasonic cleaning and FPI systems but all surface finishing challenges that Kemet can be relied on to support its diamond lapping and polishing systems. A broad range of geometries and materials are used extensively throughout the aircraft and aerospace industries because of the quality of the products but also the knowledge and support offered by the Kemet technical team.

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PCD Machining - what benefits does laser processing provide?

By Josquin Pfaff and Lars Heinzi, Agathon AG

The combination of laser roughing and grinding is the most efficient way to machine indexable inserts with tips made of superhard materials. Agathon has always insisted on this since the introduction of its Neo laser processing machine. Here is the evidence.

One thing is clear: the laser has become indispensable in the processing of superhard materials such as polycrystalline diamond (PCD). Its speed and cost advantages over grinding are obvious. But how exactly should the laser be used and how exactly can the advantages mentioned be quantified? These are questions to which the Swiss manufacturer of laser processing and grinding machines provides further answers.

About the process

PCD is hard, very hard.This makes indexable inserts with PCD tips extremely wear-resistant. For this reason, they are gaining popularity in the machining of carbon fibre reinforced plastics (CFRP) for example. PCD is so hard that grinding indexable inserts with PCD tips to the final contour is a complex process in two aspects: firstly, the grinding process takes a long time, because diamond is machined with diamond; secondly, the process is expensive for the same reason. A few years ago, a new process emerged on the market to machine workpieces with an ultra-short pulse picosecond laser and bring it to its final shape. With such a laser, material can be removed without thermally damaging the rest of the material. The fact that high-precision cutting edges can be produced in this way sounds promising. The process is extremely slow and highly complex, still it is clearly inferior to grinding, especially when machining tungsten carbide.

For the tests, this lozenge-shaped indexable insert, fitted on one side with a PCD tip, was machined

Agathon's engineers therefore decided to combine the best of both worlds, the non-cutting and the metal cutting worlds. The result is the Neo laser processing machine, with which the PCD tip, including the clearance angle, is first removed to the final contour down to a few hundredths of a millimetre. The workpiece is then given its final shape with a grinding machine, ideally with one from Agathon. This is because the products from the Swiss machine manufacturer not only work with the precision required for this but also provide the process engineering prerequisites needed for the machining of superhard materials, such as in-process dressing and very high static stiffness.

As precision is achieved in the subsequent finishing process, the main focus can be placed on the speed of the pre-processing of the workpiece, laser roughing. For this reason, the Neo uses a nanosecond laser which light pulses are longer than those of a picosecond laser. In this way, it introduces more energy into the workpiece, so that more material is removed, therefore the process is greatly accelerated. In specific terms, the PCD removal rate with the Neo laser processing machine is 10 mm^3/s, meaning 100 times higher than in the typical grinding process with a removal rate of 0.1 mm^3/s.

Laser + grinding is better than just grinding

Now let's consider the advantages of the Agathon-designed combined process of laser roughing and ground finishing compared to grinding using the grinding machine alone. Three resources can be economised on firstly time, secondly abrasive rim and thirdly dressing rim.

The PCD tips were pre-processed on the Agathon Neo laser processing machine

Basically, the more work the laser processing machine takes over from the grinding machine, the less time is required and the less the rims wear to process the carbide support and PCD tip to the final dimension. This means that the specific savings depend on two factors: on the one hand, the dimension of the PCD tip and, on the other hand, how close the laser roughs to the final contour.

The size of the PCD tip stock removal after it has been soldered onto the carbide support depends entirely on the user's individual processes. If the PCD blanks are eroded in order to divide them into individual tips, the stock removal, for example, is considerably higher than 200 µm, because the surface of the PCD is structurally altered to a certain depth by eroding. The decision as to how near to the final dimension the Neo laser processing machine should roughen is just as individual. Although the heat-affected zone of the laser used in the Neo is smaller than 5 µm, but in order to ensure a stable grinding process the stock removal after laser roughing should be between 20 and 30 µm.

Agathon has conducted a series of tests to find out how much time is needed to bring the insert to the final size. How much wear there is on the grinding and dressing rims depends on the different stock removals. From this data, the user can determine how much time, material and

money he saves, if he prefers laser roughing to the grinding process. From this he can calculate how long it would take to amortise the investment in a Neo laser processing machine.

For the tests, a ceramic bonded D10 grinding wheel with a diameter of 250 mm and a width of 12 mm was used, which was mechanically conditioned in the process with a high-grade corundum cup. A single-sided diamond-shaped indexable insert (VCGW 160408) with an inscribed diameter of 9.52 mm was machined. The PCD tip had a final dimension of 4.9 mm edge length and was 0.5 mm thick. Roughing was performed on the Neo laser processing machine and grinding on a Leo Peri grinding machine.

Looking at the measured data and their progressions, both the process time and the wear increase almost linearly with the increase of the stock removal. This linear increase facilitates the calculation of the results for those values that were not specifically included in the measurement series. In all measurements, the measurement after soldering was 400 µm per side. In three measurement series, this measurement was reduced with the laser to an average of 67, 41 and 24 µm per side. Ten indexable inserts were machined in each of the three measurement series.

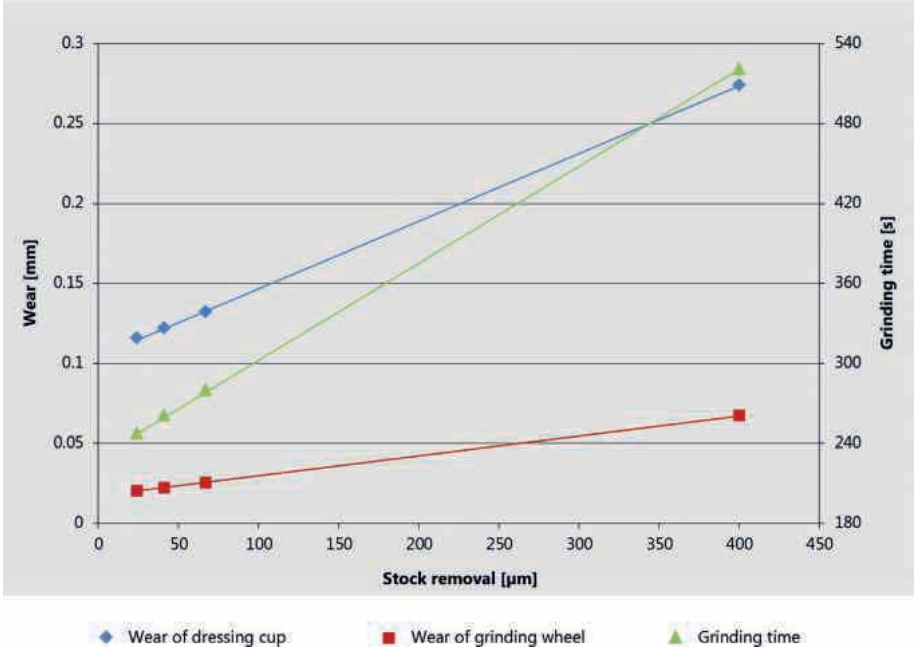
The Agathon Leo Peri grinding machine was used to grind the indexable inserts to final dimension

The data is self-explanatory

Without an up-front laser machining process, the grinding machine required 520 seconds to process indexable inserts with 400 µm stock removal to the final dimension. If, on the other hand, the stock removal was roughened to 24 µm with the laser, the grinding machine reached its target within an average of 240 s. The processing time on the grinding machine was reduced by 280 seconds, i.e. 54 percent. Taking into account the 60 seconds required by the laser for roughing, the total process time still saved 220 seconds or 42 percent. With a stock removal of 41 µm, the time saving on the grinding machine was 255 seconds or 49 percent and for the entire process 195 seconds or 37.5 percent. With a respectable 240 seconds or 46 percent for grinding and 180 seconds or 34.5 percent for 67 µm stock removal, the time saving was still a good 240 seconds or 46 percent.

The wear values are just as spectacular. On the grinding wheel, the rim was worn by 0.067 mm when the total stock removal of 400 µm was ground. Only 0.025, 0.023 and 0.02 mm were measured with a stock removal respectively of 67, 41 and 24 µm. This corresponds to a reduction of 63, 66 and 70 percent. The wear on the rim of the dressing cup was reduced from 0.274 mm to 0.128, 0.122 and 0.118 mm. This in turn means a reduction of 53, 55 and 57 percent.

"These are, of course, values that can certainly motivate insert manufacturers with tipped inserts to invest in a Neo laser processing machine," says Agathon CTO Dr Stephan Scholze. For him, these figures confirm what the company has always pointed out: the combined process of laser roughing and grinding finishing on the grinding machine is the most efficient way to manufacture indexable inserts with superhard tips to final dimension.



The graphic illustrates the tremendous advantages of laser roughing in terms of time consumption and wear

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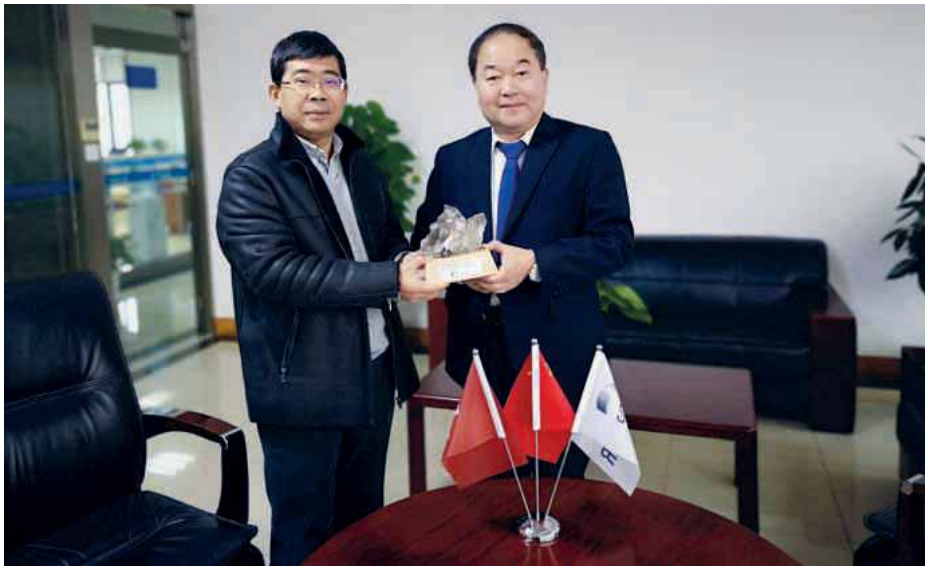
STUDER sells its 1,000th S31

Fritz Studer AG makes history with the S31 universal cylindrical grinding machine and hands over the 1,000th machine to Wuhan Hangda Aero Science & Technology Development Co. Ltd in China

Wuhan Hangda Aero Science & Technology Development Co. Ltd develops high-precision components for the aviation industry at the Dongxihu site in China. The company is experiencing steady growth and decided to invest in a new precision cylindrical grinding machine. After careful consideration and detailed technical discussions, Fritz Studer AG was awarded the contract for the S31. Towards the end of 2018, STUDER delivered its 1,000th S31 to Wuhan Hangda.



Zhao Jianwei, senior sales manager for STUDER Machines at UNITED GRINDING China (right), hands over the Swiss Rock Crystal to Yongjun Wang, deputy general manager of Wuhan Hangda Aero Science & Technology Development Co. Ltd (left)

Reliable for complex tasks

The S31 is an all-rounder, suitable for medium-sized workpieces in single, small and large series production. It scores in its compact size and is especially popular with contract manufacturers who have very high and often complex requirements for cylindrical grinding. 2,500 tonnes of Granitan®, a mineral casting that provides a vibration-damping, thermostable and wear-free machine bed, are used in 1,000 machines. An impressive figure in a successful history.

At the turn of the millennium, the first cylindrical grinding machine S31 left the STUDER halls in Steffisburg, Switzerland and is still in operation today. It is installed at Shvabe Munich GmbH in Geretsried, Germany.

"We are still very satisfied with our S31," says the head of the grinding department at Shvabe. "The machine is in full operation for external and internal cylindrical grinding. The additional functions for form and thread grinding are used for the production of prototypes. On the S31, as on all STUDER machines that are used in our house I appreciate the high accuracy and that the machines are universally applicable. The S31 is an extremely reliable and consistent machine."

Ceremonial handover in China

Yongjun Wang, deputy general manager at Wuhan Hangda Aero Science & Technology Development Co. Ltd, can be pleased. With the S31 he receives a machine with the highest precision, which will pay off for Wuhan Hangda. "A STUDER cylindrical grinding machine is the guarantee for the highest quality," Yongjun Wang is convinced. A great benefit for him, apart from the advantage to grind high-precision aircraft components, are the many features such as external and internal cylindrical grinding, thread grinding and high-speed form grinding. Thus, Wuhan Hangda can realise various grinding applications on just one machine. "We already have several STUDER machines in our factory. This is also a selling point for our customers and with this we also gain their confidence," says Yongjun Wang from his experience. With obvious pleasure he took ownership of the 1,000th S31 in a festive setting.

The name STUDER is synonymous with Swiss quality and performance. The company, part of the UNITED GRINDING Group offers high quality Swiss hardware, software, system integration and service. With a tailor-made complete solution for every grinding task, the customer also receives knowledge and skills for the grinding process. For decades, the STUDER logo has been recognised worldwide as a seal of quality and the strapline "The Art of Grinding" reflects the company's traditions as well as its commitment to the future.

STUDER has over 100 years of experience in the development and manufacture of precision cylindrical grinding machines.

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Gibbs Gears chooses KLINGELNBERG HÖFLER

Gibbs Gears recently installed a high-precision KLINGELNBERG HÖFLER CNC external/internal gear grinding machine at the company's Stoke Mandeville HQ. The advanced KLINGELNBERG HÖFLER Viper 500K will further expand the busy concern's gear grinding capacity and enable the production of the most complex of gear geometries to the highest of standards.

Now in its seventh decade of operation, Gibbs Gears is a well-known precision gear manufacturer that produces top-quality precision gears for both the UK and increasingly worldwide markets. Gibbs Gears' in-house expertise and impressive plant list allows the company to serve customers involved in some of the world's most challenging sectors, such as the aerospace, motorsport and automotive, medical, marine, MOD and defence, and the oil and gas industry.

To help guarantee the highest levels of service and the manufacture of the best possible products, company experts work closely with customers, from concept to realisation and offer technical support to full gear prototype and development.

Gibbs Gears boast comprehensive gear manufacturing capabilities and produces a wide range of high-quality precision gears, spline shafts, gear racks, pinions, worms and wheels. Complete gearboxes and gearbox assemblies are also supplied. In addition to first-class design and inspection facilities, core manufacturing capabilities include, CNC turning, CNC milling, CNC grinding, CNC gear shaping, CNC helical gear shaping and CNC hobbing.

Explaining the company's recent KLINGELNBERG HÖFLER CNC gear grinding machine purchase, Paul Stevens, Gibbs Gears operational director says: "To ensure that Gibbs Gears remains at the forefront of transmission technology and related manufacturing techniques, we are committed to a policy of continuous investment in leading-edge production equipment. The purchase of our recently installed KLINGELNBERG HÖFLER Viper 500K gear grinder was prompted largely by our growing business within the Formula 1, Formula E and other motorsport classes. It was also driven by a significant increase in business from the hypercar and aerospace sectors. The common denominators between all these industries is their need for the highest standards of precision and quality, the technically challenging nature of the complex gear geometries they specify and their frequent requirement for fast delivery times.

"Because of increasing business with these demanding sectors, we recently undertook a search for a cutting-edge gear grinder. Although a couple of the technically advanced gear grinding machines that we considered ticked some of our boxes, the only machine that delivered on all our long list of requirements was the KLINGELNBERG HÖFLER Viper 500K. It also helped our decision that many of our customers use KLINGELNBERG machines and have been delighted with their performance.

"When specifying the machine, the help of Mark Maurice, the owner of

KLINGELNBERG HÖFLER's UK agent Micronz, was extremely useful. Mark also ensured the trouble-free installation of the machine and also organised our operator training.

Now fully operational, in addition to proving its ability to produce gears with the demanding standards of precision and quality that we require, the KLINGELNBERG HÖFLER Viper 500K has the speed of operation and quick change-over characteristics that are now improving our productivity and also reducing our delivery times.

"As we manufacture gears in low to medium volumes, with a typically production run of between 20 and 200 units, the fact that the KLINGELNBERG HÖFLER Viper 500K is optimised for these kinds of volumes, makes the machine ideal for our needs."

Leading gear manufacturers throughout the world use KLINGELNBERG HÖFLER gear grinding machines to make certain that they remain at the forefront of gear manufacturing methodologies. Renowned KLINGELNBERG HÖFLER technology does more than just enable users to manufacture cylindrical gears economically and with high precision. The company's machines are designed to work together as a family in a unified system, enabling pre-machining and finishing of even the most complex gears.

All KLINGELNBERG machines have been designed with real-world applications in mind and have been developed to provide great flexibility and to satisfy a multitude of industry requirements. Global customers include contract gear and gearbox manufacturers involved in demanding sectors such as the aerospace, automotive, mining, construction, industrial gearbox and wind power industries.

The KLINGELNBERG HÖFLER VIPER 500 K gear grinding machine, as purchased by Gibbs Gears, is designed to accommodate component diameters of up to 500 mm. The machine features multiple-wheel technology and is suitable for the efficient production of small to medium-sized batches.

The ingenious configuration of the machines allows users to change the grinding technology by quickly swapping-out the grinding wheel, the grinding wheel flank and the dressing wheel. An optional internal gear grinding arm allows retooling and conversion from external to internal gearing work. In addition, the KLINGELNBERG HÖFLER VIPER 500K's innovative axis arrangement allows optimised 5-axis machining in the shortest possible grinding time. These facilities are major contributing factors to the machine's renowned flexibility and ability to consistently produce high-precision, quality work. The innovative machine design also allows easy cleaning and improved performance capabilities while saving energy.

In addition to KLINGELNBERG HÖFLER's advanced gear grinding hardware, easy to use software makes a significant contribution to the effectiveness of the company's machines. Gear-Pro operating software guarantees the convenient machining of even the most complex of topographies and ensures maximum manufacturing efficiencies are achieved. The software provides impressive productivity gains by the delivery of advanced machining strategies and logical process sequences.

Convenient software modules for best-fit, high-speed, adaptive grinding have been developed, whilst a flexible module allows highly efficient wheel dressing to be carried out. The comprehensive software offers a wide range of useful facilities. Job engineering / pre-analysis allows exact process time calculations to be made with original machine data. In addition, 3D analysis of the planned process steps, related to working range and possible interference contours, is provided, as is predictive tool wear pre-analysis. The feature rich software delivers geometric production simulation with 3D analysis of the simulated flank topography and the calculation and export of optimised tool profiles. It also offers simple navigation through clearly structured interface areas and well-organised Microsoft Windows®-like data management. Intuitive data input is made via a clear graphical display, whilst easily understandable operator guidance is provided by means of an automatically generated list of process steps. Thanks to numerous context-sensitive wizards, including wizards for a range of tried-and tested process variants, the software allows the trouble-free input of even the most complex of flank topographies and profile forms.

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Total tool control

Don't just search for tools, find them. Optimise tool inventories and ensure transparency in tool removal

ZOLLER TMS Tool Management Solutions focus on these three requirements for high productivity in machining, with cabinet systems and software and in combination with storage and lift systems from other manufacturers.

Components used in machining are diverse, ranging from cutting inserts to cutting tools and complete tools, so storage systems must use a diverse design to store them, from simple cabinets with drawers to electronically connected storage and high-bay shelving systems. Frequently, however, these storage systems come from different providers. That means the theoretically consistent flow of tool data ends at the drawer with other storage systems providers, resulting in the possibility once again of duplicate tool inventories and incorrect storage.

Incorrect storage and duplicate tool inventories are expensive. They not only tie up capital that could be used for investment but also take up space that could better be used for production.

Presetting and measuring machine manufacturer ZOLLER has tackled exactly this problem, developing storage systems and concepts to handle it. Smart Cabinets not only provide a unique storage space for every component. The software support represents each storage space graphically, using illuminated LEDs on the cabinets to help users find storage locations. Additional query tools like a cost limiting feature that supports users in budget planning and monitoring are also available, as is an assembly assistant that uses drawings and parts lists in assembling complete tools. ZOLLER is also far ahead of other providers when it comes to data connections. Thanks to individually configured interfaces, even storage systems from other manufacturers can be integrated, and respective storage locations can be tracked with the ZOLLER TMS software.

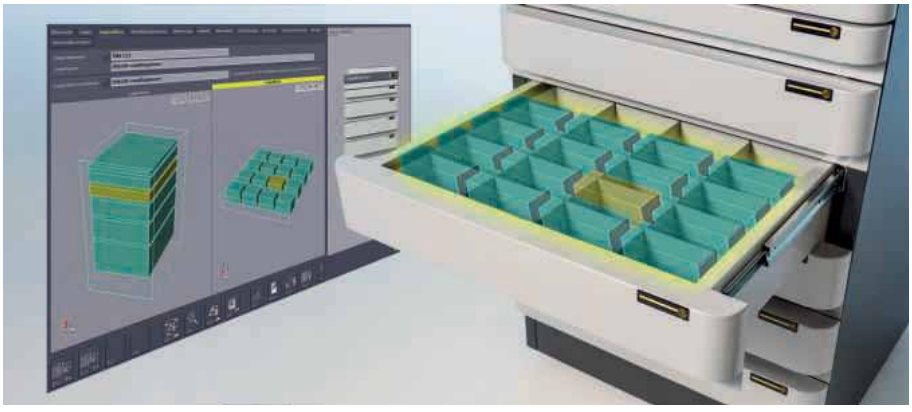
One cabinet, 1,000 options

At first glance, the toolOrganizer tool cabinet by ZOLLER looks like a simple cabinet with drawers, but upon closer examination, it allows for almost any design configuration and allows users to divide and activate individual drawers and storage compartments.

It is available in three effective heights of 600 mm, 900 mm and 1,200 mm. However, its drawers also offer great variability in height, division, and activation. The drawer heights of the toolOrganizer are available in defined steps between 50 mm and 300 mm. The only criterion is that the same effective height must be maintained across the combination. Each drawer can also be individually equipped with partitions. These divide the drawers into between four and forty-eight defined compartment sizes, so that different tools and components can be stored in a secure and appropriate manner. The cabinet can be activated via an external PC, a ZOLLER presetting and measuring machine or a separate control unit.

Drawer locking – mechanical, electronic or both

One special feature offered by ZOLLER are different options for drawer locking and activation. Mechanically locked cabinets have a central lock. When the lock is open, drawers can be opened and inspected, so that anyone can remove objects from the drawer. To better track the removal of components, tools or accessories, drawers can be electronically locked or even equipped with a single compartment locking feature. With electronic locks, drawers can only be opened when approval is provided via the booking system.



Visualising storage space

The software even provides support in finding requested elements. The relevant cabinet is highlighted in colour and displayed on the monitor with its location in production, as well as the specific drawer and compartment. The relevant drawer is released and an LED illuminates on the drawer as an additional designation. The drawer can now be opened. If the requested element is located in a compartment with single compartment locking, this compartment will be unlocked for a defined time period and will also be labelled with an illuminated LED. Once the element has been removed and the compartment closed, it will be automatically locked once again and can no longer be opened. This allows users to track at all times who has requested and removed what. Inventories are secured, and unauthorised removals are prevented.

Frequently, users have to weigh which variation makes more sense for their needs. For very expensive tools, single compartment locking is certainly the right choice, while standard tools or accessories can also be stored in open compartments. Within a cabinet, individual drawers can be equipped with electronic locking and single compartment locking, depending on user requirements.

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AGS announces record sales of grinding machines

Coventry-based Advanced Grinding Solutions (AGS) has announced record sales of its range of grinding machines and associated equipment, with over 50 machines currently under order for various companies based in the UK and Eire.

Leading the way are the sales of Rollomatic CNC tool grinding machines that have taken off since AGS was appointed as Rollomatic's sole UK agents around 18 months ago. Rollomatic offers a large range of CNC tool grinding machines for the production of all kinds of tools including end mills, drills, special form tools, burrs and inserts and there are more rotary tools manufactured on Rollomatic machines in the UK than on any other machine.

Chris Boraston, MD at AGS comments: "It was an unbelievable end to 2018 and we now enter 2019 with a record order book with no sign of it stopping, which of course is great news not only for us but also a key indicator of just how well British and Irish manufacturing is doing. We have always seen the tool grinding industry as a key indicator because if they are busy then all the machining centres and milling machines are busy and if they are busy nearly everyone is!

"With the Rollomatic machines, it has been especially pleasing to see so many sales being made to new customers who have been buying Rollomatic's for the first ever time. Several sales have also been made to the smallest of companies who after many years of thinking about investing have now chosen Rollomatic to allow them to manufacture cutting tools and very special parts for the mould and die and medical industries to the highest possible precision and in the lowest cycle times. Many customers are attracted by Rollomatic's industry leading no quibble three years parts and labour warranty that is supplied as standard along with free installation. That is a testament to just how well Rollomatic's are built and it's great to see a machine manufacturer supplying warranties such as these free of charge and as standard."

In addition to the Rollomatic sales, AGS has secured orders to the value of around £7m for Bahmuller who are supplying many internal, external, and combined grinding machines to the Delphi Technologies plants in Stonehouse and in Sudbury as Delphi's own sales of its advanced range of fuel injector systems for heavy duty diesel engines continue to climb to record levels. The Bahmuller machines offer the best possible grinding quality with tolerances, in some instances of under 0.5 µm for roundness and straightness etc. along with extremely fast cycle times of just a few seconds per part. Bahmuller offers full turn-key solutions to include operations such as washing, drying, deburring, laser marking, measuring (including pre-process, in-process and post process gauging). Bahmuller is also now starting to offer its own range of loading systems rather than integrating ones manufactured for Bahmuller by outside suppliers.

Turning to deburring, AGS is heavily involved in the supply of Magnetfinish machines for the deburring of a variety of parts, notably cuttings tools of all kinds and parts for the automotive and medical industries. AGS notes that many of its customers have invested in SEM machines (Scanning Electro Microscopes) that achieve a resolution of under one nanometre, so suddenly particles measuring sub-microns are very easy to see as many applications call for burr free edges.

After being produced by a grinding process, cutting tools of all types can suffer from having jagged and sometimes very sharp cutting edges as well as micro-sized burrs. These impact heavily upon the

lifetime of cutting tools and can also affect their performance during heavy cutting and this often means that tools cannot be used at optimum speeds and feeds. When milling, drilling or tapping at extreme speeds the resulting high temperatures that develop at the cutting edges are the main source for such problems because the tool becomes highly susceptible to wear and even fracture. Deformed hot chips, which may even weld to the tool surface and form built-up edges, also greatly impair high-speed machining. The subsequent jamming of chips or even more minor impairment to chip flow that results from this quickly brings about a premature end to tool life. The patented Magnetfinish technology that has been developed by Dr Wolfgang Thiel of Magnetfinish addresses this problem.

The Magnetfinish process polishes the flutes on all types of HSS and Carbide rotary tools such as endmills, form cutters and drills, provides the perfect conditioning or "edge honing" of the cutting edges (micron rounding of the edge) and is also used to polish profiles on taps and coated cutters. Other applications lie in the fields of the fuel-injection, medical and hydraulic pump industries whereby burr free parts are often considered to be a critical necessity.

The Magnetfinish polishing process of the tools flutes results in a superior chip flow leading to the increased productivity of the tool. The surface finishes on the tool flutes that are generated by the Magnetfinish process are of the order of just 0.02 µm Ra. Tests have shown that these fine finishes ensure that the subsequent friction caused by chips running through the cutting tool flutes can be reduced by 50 percent, thus resulting in faster and smoother chip evacuation that allows faster feeds to be used resulting in faster cycle times during milling and drilling operations. If the swarf or chips created during end machining are not removed as fast as they are produced, the flutes can tend to clog up and prevent the tool from cutting efficiently and this causes vibration leading to early tool wear and overheating. Cutting tools with polished flutes for superior chip evacuation are also very important when machining dry without coolant to help chip flow and to reduce heat build-up.

The tool's primary cutting edges are machined to allow a defined and reproducible radius of between 3 µm and 50 µm to be created. This edge preparation process can increase the lifetime of tools such as ball nosed end mills by a factor of four, as well as allowing more consistent machining results to be achieved as from using the tools for the very first time.

Apart from the grinding and finishing machines, AGS also supplied a wide range of CBN and conventional abrasives from its grinding wheel suppliers Krebs & Riedel.

Krebs & Riedel manufactures high quality conventional, diamond and CBN abrasives from around 4 mm to 900 mm in diameter 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 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 also a reduced spend on expensive diamond rollers.

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 currently available from the manufacturer. With such a huge variety of wheels, 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.

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Customised grinding of transmission shafts with modular components

Technological advances in automotive engineering are rapidly changing the demands for production technology. This is not just for new processes but also applies to established processes such as the cylindrical grinding of transmission shafts. To meet the changing demands, the components have increasingly complex geometric details and need to be finished with the highest precision. As a result, manufacturing companies depend on mechanical engineering to develop individualised grinding solutions for the shafts, ideally, integrated into complete production lines.

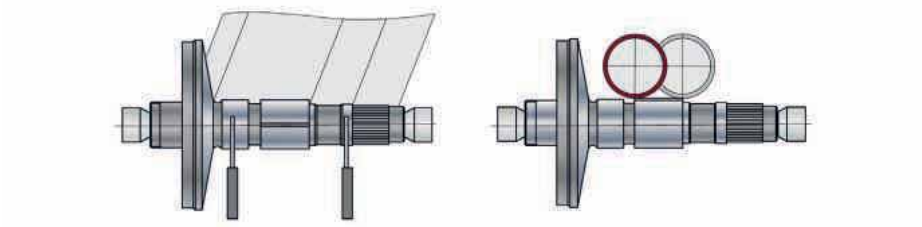
The grinding specialists from the EMAG Group have developed the perfect solutions for this environment: the HG 208 horizontal cylindrical grinder,

Off the shelf grinding solutions are virtually impossible for many applications and drive shafts for electric motors, complex camshafts or crankshafts as well as transmission shafts all require very different processes. For example, different solutions are required depending on if only a single grinding operation, several parallel grinding operations or combined internal and external grinding operations are necessary. Additionally, the component and grinding technology used may add additional technology requirements such as in-process measuring devices; dressing unis for CBN and corundum grinding wheels, automatic balancing units and more.

Guido Hegener, managing director of EMAG Maschinenfabrik says: "We offer our customers a wide range of different technology modules that can be easily integrated into a standardised machine. For instance, the HG 208 can be equipped with one or two compound slides, on each of which different external and internal grinding spindles can be fitted. By using a B-axis or a centre drive, for example, we can provide the perfect solution for each customer-specific application."

CVT transmissions are an example of how developments in the automotive industry can influence and drive forward such a flexible concept. This technology is being used in modern hybrid drives, effectively combining the power of combustion engines and electric motors. The central or primary CVT transmission shaft represents a real grinding challenge in the production process. On the one hand, the control wheel surface is precisely machined by an angle plunge, while on the other hand, axial ball track grooves have to be machined. With EMAG, both processes are performed in a single clamping operation in order to avoid reclamping errors and to achieve increased precision. For machining the grooves, the grinder is equipped with a dressable ceramic CBN grinding wheel. With its perfect dressing system, the quality of the ball track stays high.

A wide range of technology modules are available for the development of individual grinding solutions



This example illustrates how the HG machine can be specifically adapted to the conditions imposed by the various components. On the left is a large corundum grinding wheel for external machining and on the right a small CBN grinding wheel for groove machining, arranged on two separate slides with separate dressing systems

For machining the taper face on the primary shaft (and similar surfaces on other shafts) EMAG has recently expanded its HG modular system: A corundum grinding wheel with a maximum diameter of 750 mm (29.5 inches) is used for this task.

"This example illustrates how we continually adapt the machine and the available modules to the conditions imposed by the various components. This allows us to create the perfect technology configuration for the customer: a large corundum grinding wheel for external machining and a small CBN grinding wheel for machining the grooves, arranged on two separate slides with their separate dressing systems. This ensures that the requirements for quality and cycle times are met," explains Guido Hegener.

With these updates, the HG 208 can now successfully perform cylindrical grinding operations on crankshafts and camshafts. Parallel external and internal machining of hollow shafts is also made possible with this concept. For this purpose, there is a variant of the HG 208 with a direct-driven centre drive. EMAG grinding experts see a great opportunity in the growing electric vehicle market for the HG 208 and its associated product lines, due to its efficient grinding operation of the central drive shaft for electric vehicles.

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Ashton Jig & Tool doubles up on Perfect grinding solution

Ashton Jig & Tool was founded 60 years ago by the current managing director Jon Clifton's father. As the name implies, it originally provided precision toolmaking supplying press tools and jigs and fixtures to local industry. Now with a gradual move into CNC machine tools, temperature-controlled quality control and spark and wire erosion, it has diversified, supplying a diverse range of customers from across the UK, including being a 1st and 2nd tier supplier to many blue-chip businesses from the gas & oil, nuclear and pharmaceutical sectors among others.

"While press tooling is a smaller part of our business, we still work to the same exacting standards in terms of quality and tolerances for our ongoing precision subcontracting work," says Jon Clifton. "Quality remains paramount to us, of course price is also important, so we have to work efficiently as well and invest where necessary." It was this need to invest to meet a customer requirement that saw Ashton Jig & Tool first approach RK International Machine Tools when it needed larger grinding capacity for a specific job. This resulted in an order being placed in September for a Perfect PFG-50150AHR column-type surface grinder which, with its 500 mm by 1,500 mm table capacity was ideal for the work in-hand.

In addition to the larger capacity, the Perfect machine also added greater control and flexibility to production, due to the ability to program the rough and finish cuts for both depth of cut and number of passes. The machine's auto shutdown facility also allows an element of unmanned operation as it will switch itself off once the required number of passes have been completed.

While this first Perfect grinder was being built, at the factory Ashton Jig & Tool faced more grinding pressure when an old machine it had been using for many years, in the words of Jon Clifton 'blew up'. Beyond economic repair, this meant that he needed to replace that capacity as quickly as possible and therefore called RK International again.

"Given the urgency of this second machine, we were relieved to hear that RK International had a machine, a Perfect PFG-D4080AH saddle-type surface grinder in stock. With its 400 mm by 800 mm table being ideal for what we needed, we could have it delivered within three days of our initial phone call. The service provided by RK was exceptional. They knew we were desperate for the machine and pulled the stops out, while at the same time not trying to capitalise on our situation with regards to the cost of the machine."

Jon and Ben Clifton with their two new Perfect grinders (front splash guards removed for photographic purposes)

With both machines now installed side by side, the operators, including Jon's son Ben, quickly came to terms with the control systems, taking to the machines like 'ducks to water' according to Jon Clifton. Within a couple of hours, the machines were being programmed and operated to their full capability, achieving tolerances and quality of finish described as exceptional in comparison to the previous machine.

"The availability of the one-micron readout and total elimination of any bounce when pitching across on the larger machine has given us the results that we wanted," says Jon Clifton. "We are now able to better manage our production, due to the consistency that we can grind to, even on materials such as 17-4PH stainless steel.

The saddle- and column-type machines from Perfect share similar features, such as their optimised construction using high quality cast iron, with major components stress relieved to ensure maximum rigidity, stability and machining accuracy. Slideways feature Turcite-B coating that adds to smoother motion and longevity of the slides. The cartridge-type spindles feature class P4 high precision angular contact bearing that achieve runout accuracy of two microns, with the added benefit of being sealed and lubricated for life. Both types of machine can also be fitted with the optional AD5 auto down feed system, making them fully automated for additional productivity gains.

The control unit on the larger PFG-50150AHR column type machine

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Time-saving grinding of large workpieces with corundum

The new Numerika GH 3500 2W corundum grinding machine from the Junker Group synchronously machines large workpieces, such as axle beams, rotors or shafts, with two-wheel heads. This reduces cycle times by more than half, making this sturdy, low-maintenance machine an excellent choice for producing high quantities.

With the Numerika series from Zema, the Junker Group offers economical and reliable cylindrical grinding machines with corundum. This range is now being extended to include the Numerika GH 3500 2W, a machine with two-wheel heads with their own compound slide rest. In comparison to the one-carriage machine, in which the workpiece is initially turned and machined using two clamping operations, synchronous machining of both sides of the workpiece reduces the total cycle time by more than half. The ability to carry out all machining in a single clamping set-up also raises quality. Thanks to its equipment and high level of automation, it is particularly suitable for users who mainly machine large quantities of big workpieces.

The new Numerika grinds workpieces with a weight of up to 350 kg, or even up to 1,000 kg with the optional KARGO version. The largest version is designed with a clamping length of up to 3, 000 mm, a two-sided grinding length of 780 mm and a peripheral diameter of up to 650 mm. The large grinding disc packets with a maximum diameter of up to 915 mm and correspondingly longer service life result in longer tool lives.

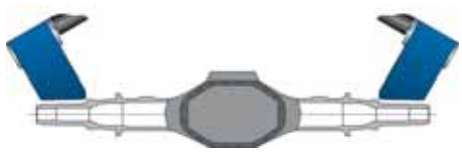
The Numerika GH 3500 2W from the Junker Group synchronously machines workpieces by using two wheel heads

Inside a Zema corundum grinding machine - with the cylindrical grinding machine from Zema, the Junker Group is also offering efficient solutions for conventional grinding

Despite its power, the Numerika GH 3500 2W impresses with its carefully-considered and compact design, which also ensures that the machine can even be loaded from above in halls where the ceiling is less than 5 m high. On request, the Junker Group can also equip the machine with fully automatic loading and unloading systems to ensure production runs smoothly.

The Numerika is extremely low maintenance thanks to the proven Zema hydrostatic technology. The workpiece and wheel head spindles are mounted on hydrostatic bearings, the X and Z axes of the compound slide rests are hydrostatic as well. A fine layer of oil enables virtually perfect spindle rotation with constant shaft centring and uniform, jolt-free movement of the compound slide rest, which can be positioned with great precision.

As there is no metal-to-metal contact, less energy is required for the drive and wear is reduced. At the same time, the hydraulic medium provides permanent cooling and acts as an excellent vibration damper.



Axle shafts - the two grinding spindles on the Numerika reduce the total cycle time by more than half

Easy handling and operation

Each of the two work heads are driven with the same power. This increases the torque transmission and quickly brings heavy workpieces to high speeds. In addition, supporting steadies stabilise longer workpieces, ensuring faster grinding with better quality.

With the Numerika GH 3500 2W, Zema meets the highest requirements with regard to quality and efficient production. The torsionally rigid machine bed also helps to deliver perfect grinding results. Customers also opt for the machine due to its ease-of-use. The user-friendly control system offers all required input screens for precise grinding and outstanding surface quality.

A Zema machine with Junker services

As part of the Junker Group, Zema has Junker's global sales and service network at its disposal, which has impressed discerning manufacturers for years. They are looked after by trained employees and, if necessary, receive immediate assistance around the world, 24/7.

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Chicago Pneumatic introduces powerful industrial vertical grinders

Chicago Pneumatic has introduced its next generation CP3330 and CP3340 industrial vertical grinders, aimed at foundry workers, metal fabricators and MROs worldwide. The CP3330 and CP3340 series set a new high standard of operator safety and productivity, proven to remove material twice as fast as similar tools on the market. Following the successful launch of the grinders in North America in 2017, they now comply with the CE ISO 11184-7 safety standard requirements in addition to the ANSI/CAGI B186-1 regulations, so users can rest assured that they are following best practices.

"We are excited to make the grinders available globally, so metalworking professionals worldwide can benefit from this best-in-class tool which offers the highest levels of quality, robustness, durability and ergonomics they have come to expect from Chicago Pneumatic," says Lucas Bryk, global product marketing manager - Material Removal at Chicago Pneumatic. "The added benefit for global metalworking professionals is that now they can purchase one range of tool that can be used in any site regardless of location, enabling them to save on purchasing and procurement costs."

The CP3330 and CP3340 series are ideal for various applications in casting plants, shipbuilding and the oil and gas sector. Equipped with powerful governed motors, 3.7 hp (2,800 W) for CP3330 and 4.5 hp (3,400 W) for CP3340, the new industrial grinders can achieve a superior material removal rate and reduce completion times, delivering an instant return on investment.

To maximise operator safety, these innovative industrial vertical grinders feature

a unique over-speed shut-off device that reduces the risks of abrasive-related incidents caused by air pressure fluctuations (above 90 PSI/6.3 bar). In the unlikely event of overpressure, this device stops the tool, preventing the abrasive from over-speeding and causing possible accidents. Other safety features include a high resistance protective guard (1"/ 2.6 mm thick) and a streamlined safety lever which is easy to use while wearing heavy gloves.

The CP3330 and CP3340 industrial vertical grinders are available with 7" (180 mm) and 9" (230 mm) abrasive grinding and cutting wheels and 6" (150 mm) cup wheels, offering users the perfect grinder for each application. There are models ideally suited to contouring, deburring, cutting, finishing and weld cleaning of different materials such as cast iron, steel, stainless steel, aluminum, composite, magnesium and titanium. The 6" cup wheel model comes with a new safety guard which opens at 1,800, providing users with greater abrasive accessibility and easy tool operation.

Since 1901, the Chicago Pneumatic (CP) name has represented reliability and attention to customer needs, with construction, maintenance and production tools and compressors designed for specific industrial applications. Today, CP has a global reach, with local distributors around the world.

Personnel at Chicago Pneumatic start every single day with a passion to research, develop, manufacture and deliver new products that are meant to meet your needs not only today, but tomorrow as well. To learn more, visit **www.cp.com**, or contact:

Chicago Pneumatic Tools
Tel: 01442 838999
www.cp.com/en-uk/tools

Everything perfectly interlocked as long as the surface quality is right

Dr Tim Göttsching, Christoph Lichtwardt and Enrico Kaminsky

Gears are among the essential elements in mechanical engineering and vehicle construction. The importance of gear units is constantly increasing to meet growing requirements concerning efficiency and noise development. The hard fine machining of gear components by grinding processes is essential.

Gear drives transmit and transform movements, energies or forces and are an integral part of drive units in cars, ships, many wind turbines and machine tools. For the automotive industry in particular, the transmission is one of the key elements to ensure the best possible powertrain efficiency. This also applies to current developments in the field of e-mobility. A fully electrified vehicle will continue to be equipped with a multi-stage transmission to ensure maximum ranges. Also, the demands on the noise behaviour of transmissions are increasing, as audible and perceptible vibrations are increasingly perceived as disturbing, especially in e-mobility.

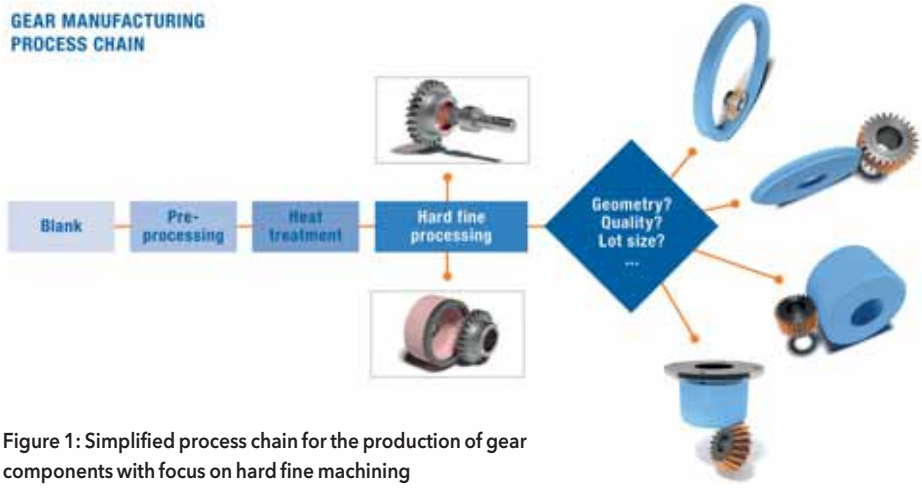

Figure 1: Simplified process chain for the production of gear components with focus on hard fine machining

Finishing of gears by grinding

Gear wheels are manufactured from blanks which are first pre-processed by turning and milling using forming technology or a defined cutting edge. A subsequent heat treatment adjusts the desired structure and hardness of the gear flanks. At the same time, changes in shape occur in this process step, which necessitates final hard fine machining. Hard fine machining is usually carried out by manufacturing processes with geometrically undefined cutting edges to achieve two essential target values: a Maximum load-bearing capacity of the gear flanks and minimum noise emission during operation. The quality of the gear wheel is primarily determined by the generation of involute surfaces.

Before the final hard fine machining of the involutes in the industrial series production of gears, grinding of bore and end faces is often carried out first. For this purpose, the gear wheel is finished plane-parallel with a cup wheel or machined using an internal cylindrical grinding process (see Figure 1).

Which grinding process is selected for machining the tooth flanks depends on several questions. For classic series production with high batch sizes, as in the automotive industry, continuous generating grinding or gear honing is preferred, as short machining times can be achieved with these processes. Gear honing offers the great advantage of being able to machine gears with so-called interfering contours. Interfering contours are parts of the workpiece that would hinder the path of the generating grinding body during the feed movement. Such challenges are avoided with gear honing. Furthermore, the thermal stress during gear honing is low due to the low cutting speeds, so that grinding fire-free finishing is achieved. Distinct residual compressive stresses in the peripheral zone of the tooth flanks are characteristic of gear honing. Also, the topography differs from roller-ground or honed surfaces, so that this can also be a decision criterion. If a gear wheel with an allowance larger than 100 µm is to be finished using grinding technology, gear grinding proves to be the better choice.

On the other hand, discontinuous profile grinding is favoured for large gears, which are frequently used in wind power, marine or construction vehicle transmissions. In most cases, the batch size of such gearwheel production is significantly smaller, even down to individual production. Pinion and ring gear for bevel gears are exclusively machined with specially profiled cup wheels, which is referred to as bevel gear grinding.

Grinding tools for the machining of gears

More and more the hard fine machining of the bores is carried out with highly hard grinding tools. Although the use of CBN as a cutting material is more cost-intensive, it brings productivity advantages and guarantees prudent use. However, conventional cup wheels are often still used for finishing the end faces. Hermes Schleifmittel GmbH has developed a unique CBN specification called TOPCUT for this process to exploit the advantages of the superabrasive cutting material.

For the continuous gear grinding of gear wheels, profiled grinding worms are used (see Figure 2). Depending on the application, there are different performance classes of the tools. For a variety of applications, standard specifications are the most economical solution, as they often offer the best price-performance ratio. However, this often does not apply to processes with high demands on the material removal rate and profile stability. In these cases, only sintered corundum tools are suitable. This also applies to profile and bevel gear grinding wheels. For these high-performance tools, sintered corundum mixtures are embedded in specially developed bonding systems to ensure effective chip and coolant transport with an optimum microstructure. Hermes

Schleifmittel GmbH's latest development in this area is offered under the brand name VITRA.

By combining conventional hob screws with a fine grain or elastic polishing hob screws, powerful combination tools are

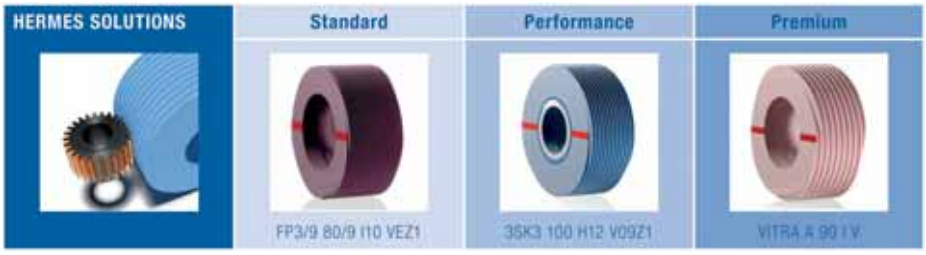

Figure 2: Tools for continuous gear grinding for different performance requirements

There are also different performance classes for honing tools. Important selection sizes for the right honing ring are: type and quality of the preparatory work; material and hardness of the gear wheel; oversize to be machined; desired final quality; existing machinery.

Classic honing rings are resin bonded honing rings with embedded ceramic conglomerates. Hermes Schleifmittel sells such honing rings under the product name PROFINE (see Figure 3). However, the latest machines with direct drive also make the use of ceramic bonded honing rings possible. The process is also known as power honing and makes it possible to machine highly productive gears hard and fine. For this purpose, the CERFINE product series was developed in cooperation with universities and machine manufacturers.

created which enable sequential grinding and fine grinding or grinding and polishing in one clamping (see Figure 4). The front tool part, the so-called "high-performance range," consists of ceramic-bonded sintered corundum and is used for the pre-machining of the gears. Subsequent fine grinding or polishing makes it possible to generate gear flanks with low roughness up to reflective surfaces. Hermes Schleifmittel GmbH has developed a new microlite specification especially for generating polishing, which was systematically tested with the aid of generating grinding tests at the Fraunhofer IWU in Chemnitz. Hermes microlite grinding tools are more or less elastic polyurethane-based abrasives interspersed with abrasive grit.

Figure 3: Tools for gear honing

Trends in gearing: high surface qualities

With the help of modern combination tools, production processes in the field of grinding and polishing can now also be realised more efficiently. The example of generating grinding for machining gear wheels shows clearly how a combination of different tool types can be implemented.

Surface quality as the measure of all things

Friction minimisation and noise reduction are becoming increasingly important in the design of motors and transmissions. These correlate directly with the surface qualities of the corresponding functional surfaces, which are the result of the previous grinding process. The high demands on this usually last machining step of the process chain can only be achieved with the aid of high-precision grinding tools. Gear wheels are machined hard and fine using generating grinding, gear honing, profile grinding or bevel gear grinding. Generating grinding and gear honing are the most widespread processes in the mass production of small-module gears. Different tool types exist for both processes, which can be sorted according to process performance. The use of fine grain grinding tools or elastic polishing tools also makes it possible to produce high surface qualities Rz < 1 µm with a high contact ratio.

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Figure 4: Gear grinding and polishing at Fraunhofer IWU in Chemnitz

Surpass your expectations with Novastar

Mirka UK introduced the next generation of abrasives to market in September with the launch of Novastar. This new multi-hole abrasive has been developed with durability, versatility, productivity and efficiency at the forefront of the design process, enabling users to handle the most demanding of sanding applications, while still being able to provide a consistent scratch pattern.

Novastar, like most of Mirka's abrasives, provides the user with efficient dust extraction the brand is synonymous for. This process is ably assisted by its new multi-hole pattern and precision coating, ensuring that the dust produced is repelled, avoiding clogging.

Suitable for use on hard surfaces and lacquers, where a robust film abrasive is required, it provides an aggressive initial cut especially with coarse grits (80-100) and is P graded from 240-600 to provide a finer finish. It is wear-resistant for increased durability and its flexible backing means that it does not lose grain, even when folded.

Craig Daycock, managing director of Mirka UK, says: "The markets our abrasives are used in are rapidly evolving, so we have to remain at the forefront of innovation to meet the needs and requirements of our customers. We believe the work the R&D team has put in to developing Novastar will enable users to tackle previously demanding tasks with ease and will surpass customer expectations."

Cut to the finish line faster with Mirka Iridium

Also launched in September was Mirka Iridium, a new robust abrasive designed to cut faster and more efficiently while repelling dust. Aimed at bodyshops, workshops and industry, Iridium employs a new precision coating to speed up the sanding process.

Iridium's new multi-hole design and non-stick coating avoids loading or pilling from the dust that is created when the abrasive is in use, so the grains stay sharper for longer and the dust extraction is faster and more efficient.

In addition, its blend of ceramic grains allows the initial cut to be more aggressive and longer lasting, while producing a consistent scratch pattern for the lifetime of the abrasive. Available in both discs and strips, Iridium's coarse and fine grits allow the abrasive to work well on both soft and hard surfaces, while its flexible backing also offers excellent grain adhesion and no loss of the grains, even when folded.

Craig Daycock explains the advantages: "Our customers want a user-friendly product that allows them to complete a job in the fastest possible time, while providing an efficient overall process. Iridium meets these demands with ease, while moving up a gear to take abrasive design, development and technology to the next level."

Mirka is a leading manufacturer and supplier of abrasives to the automotive industry, automotive finishing, composite manufacturers, wood and furniture industries, as well as the metal finishing industries for more than three decades. Mirka specialises in coated, non-woven and dust-free sanding products for surface finishing, manufactured in the company's modern production facility in Finland. Mirka's extensive product range caters for both individual operations and complete sanding systems. The Mirka concept of dust-free sanding, combined with effective surface finishing solutions, has replaced traditional sanding methods in many industries. The abrasive range is completed by supplementary products and accessories, enabling Mirka to offer its customers complete sanding solutions.

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100 years of grinding history and a revolution in clamping technology

As TYROLIT celebrate its 100th anniversary on 13th February, the company confirms its commitment to innovation, by partnering with BOSCH as it aims to revolutionise the power-tool landscape

One click and it's done

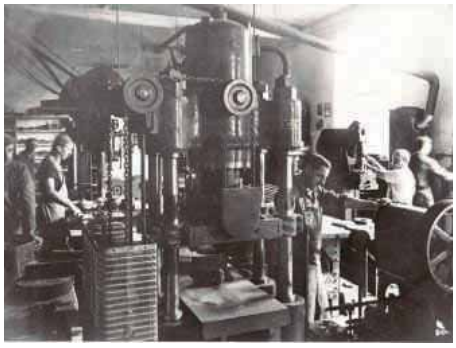
This year Bosch has launched its new clamping technology for attaching abrasive discs to a range of its angle grinders. The system, called X-LOCK, breaks 80 years of standstill in clamping. Through a simple click mechanism, an abrasive disc such as a cutting disc connects in seconds to an X-LOCK angle grinder. The abrasive disc must have a special fixture to work with X-LOCK and TYROLIT is one of the first abrasive manufacturers to integrate the fixture into its abrasive disc assortment.

X-LOCK makes it easy to change abrasive discs and resolves many problems of other systems. Traditional clamping systems are prone to problems, for example, clamping flanges can wear out, flanges may be difficult to remove, and if tightened incorrectly, injury can occur. This new technology is proven to dramatically reduce change over time of the disc. With every application, working time can be saved and, with an average saving of 30 seconds per application, productivity can be increased by up to 40 percent. This is particularly relevant for industries such as automotive, where swapping between applications is common practice.

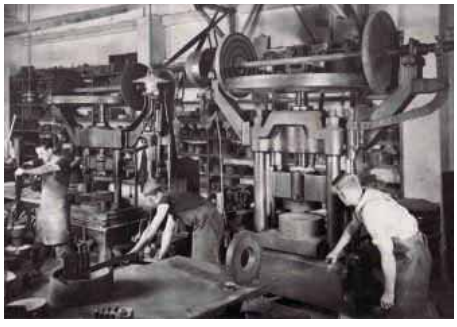
"With our new range of X-LOCK-compatible abrasive discs, TYROLIT offers Bosch power-tool users the highest quality in cutting, flap discs and grinding discs too," says Christian Unterberger, product manager at TYROLIT. "We are very excited to be part of this technology and look forward to developing more products for the X-LOCK system."

The new clamping technology for angle grinders is poised to take the market by storm and, together with Bosch, TYROLIT is at the forefront.

100 years of grinding history 1919-2019



Exactly 100 years ago on 13 February 2019, TYROLIT was founded. The company has grown from a local expert in grinding crystals to an internationally successful industrial group with subsidiaries all around the world. Today, the TYROLIT group has more than 4,500 employees and is one of the world's leading manufacturers of grinding and dressing tools, as well as a



system provider in the construction industry. The 29 production sites manufacture more than 80,000 products, which are sold through 35 sales companies and distributors in 65 countries all around the world. Since 1919, TYROLIT has stood for products of the highest quality, innovation and service strength. The Tyrolean family-owned business, which is part of the Swarovski Group, is located in Schwaz, Austria.

From 1919 to now, the what, the why and the when

With the goal to create a diamond for everyone, Daniel Swarovski laid the cornerstone of his crystal empire in 1895 in Wattens, Austria. He invented an electric machine that allowed him to cut glass more precisely than it was possible by hand. Through manufacturing and developing the tools necessary to grind glass jewellery, a vast knowledge in grinding was built. Harnessing this expertise, a new company, specialising in grinding solutions was registered and named after a mineral found in the region: TYROLIT.

Quickly realising the potential of the innovative industrial grinding tools beyond self-provision, TYROLIT started supplying manufacturers in Austria as well as in Germany, Italy and Russia. The business was growing and developing and a new independent headquarter and production facility in neighbouring Schwaz was constructed. Soon after completion of the first factory, it was at capacity and expansion was necessary to meet the growing customer demand. With the company's commitment to innovate for its customer base, bigger and more advanced grinding tools went into production. Over the next few years TYROLIT's reputation as a solution provider saw it win more business across the globe. The company had now established itself as a global brand in all continents, supplying grinding solutions to over 50 countries.

The high level of expertise in grinding, combined with the continual pursuit of technological innovation, had a lasting impact on the international abrasives market. The "Secur-Extra" grinding discs, which were first produced in 1959, provided unprecedented grinding performance for

stationary cutting machines. At the same time, TYROLIT pushed into new industry segments where the high-precision know-how and tools made significant contributions to a large number of processing steps. 40 years after its inception TYROLIT products were available in 67 countries.

In 1962, Heinrich Harrer, Austrian mountaineer, author and tutor to the Dalai Lama went on an expedition of New Guinea. During this expedition, over 31 ascents were made and TYROLIT sharpening stone was used, impressing the locals and opening up a new found use for the Austrian Brand!

The following years saw more and more products for surface treatment and processing, among them saws and drilling equipment for the construction and stone industries. Not only were the customers' demands for flexibility being met, but also performance of the tools and consequently their economic efficiency, was increased. Using the expertise nurtured over decades in 1973, TYROLIT increased the rotational speed from the industry standard of 80 m/s to 100 m/s. This higher cutting speed brought significant advantages that benefitted all TYROLIT customers.

In 1975 TYROLIT expanded its global position even further. TYROLIT gained a presence in the Middle East and Argentina as well as acquisitions in the Czech Republic and North America. New strategic markets were developed with local sales and production sites being created. Ongoing investments in the expansion of the existing infrastructure and further acquisitions served to strengthen the position in the key markets of North America and Europe.

2014 saw TYROLIT acquire its own production site in Africa and therefore now has production facilities on all continents. Under the brand name TYTOLIT Life, the company pushed into the consumer market and now offers ground breaking and elegant products for private households

The list of innovative products is exhaustive. Whether the innovation saves time, money or is developed to improve user welfare, the commitment of the company to the needs of their customers and the industries they touch is ever evolving. From a diverse product range in the hand-programme sector through to bespoke solutions for a wide range of industries including medical, aerospace, automotive and construction, TYROLIT never stands still and will continue to shape the world.

TYROLIT X-LOCK products will be available from 01.04.2019.

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Engis launches upgraded single pass bore finishing solution

Engis UK, the European Division of Engis Corporation, has announced Engis' latest Single Pass Bore Finishing machine, the FPM-3X-2, an enhanced 3-axis bore-finishing system for the single-pass honing of hydraulic stack valves.

The new FPM-3X-2 builds on its precursor's strengths by adding an independent second table so that one table can be loaded and unloaded while the other is in operation, creating even more flexibility for greater output, while, at the same time, different parts can be processed with their own specific tooling and programming.

These capabilities allow for the finishing of a wide spectrum of components with quick change-over. The twin-table design also allows operators to load several components at once for unattended finishing.

Building on the strengths of the FPM-3X, which has proved to be the market's best solution for precision stack-valve bore honing, the FPM-3X-2 takes that technology to a higher level, being the only single-pass honing machine to offer the FPM-3X's powerful production attributes with the increased potential of a second table.

The FPM-3X was created to provide more range and customization with greater features and operations for single-pass bore finishing. The need for such a machine was prompted by the limitations of systems with multiple spindles around a rotary table because, while the multi-spindle rotary system could improve production by performing all finishing procedures at once, it could not always meet all of an application's requirements.

As fully CNC-controlled, 3-axis single-pass bore-finishing machines, both the FPM-3X-2 and the FPM-3X utilise an automatic tool changer for complete versatility. When a new part is loaded into either the FPM-3X-2 or the FPM-3X, bore locations are inspected automatically by placing a Renishaw probe into the spindle and feeding it into each bore to touch off on four sides for exact measurements.

The inspection results are used to implement the required offsets and provide perfect bore positioning. The system next performs the finishing sequence for each bore with the desired diamond tools and the table is then returned to the home position with the finished stack-valve assembly for unloading.

Customised machine solutions

Even with the extensive single-pass bore finishing range, Engis recognises that not every bore finishing application fits neatly on a standard machine platform. In such cases, Engis engineers can design a unique system to suit a specific application, optimising part geometry at minimal cycle time and cost. Engis has created a number of custom-designed bore finishing solutions for the hydraulic, automotive, compressor and firearm markets which are in full production across the world.

Examples from the Specialty Series include in-line transfer systems, concentricity establishing models, automated pressing, polishing and bore finishing models, multi-column systems for large parts including bore finishing, gauging, brushing, face deburring and marking and machines with special multi-spindle arrangements capable of simultaneously finishing multiple bores in a single part.

Background

Engis Corporation is a worldwide organisation headquartered in Wheeling, IL, manufacturing and marketing superabrasive finishing systems and high-precision micron diamond and CBN powders for operations that demand precision surface polishing and close-tolerance requirements.

Engis provides products, services and technological advances in key areas including diamond flat lapping/polishing, diamond- and CBN-plated tools, high-precision honing machines and tools, tool-room products and R&D technical support.

As Engis bore finishing tools are electroplated, rather than bonded with a metal or vitrified matrix, the superior diamond particle exposure provides for cooler cutting action and better size control versus more conventional honing tools.

Engis manufactures a wide variety of honing tools, including tools for blind bores, self-adjusting tooling, seating tools and coolant-through-tool designs, offering options ranging from tools suitable for use on the simplest drill presses to those for use on the most sophisticated 5-axis machining systems and transfer lines. Also, because Engis designs complete honing/bore finishing systems, its tools function in complete harmony with both the machine tool and fixturing, to provide the optimum bore finishing solution.

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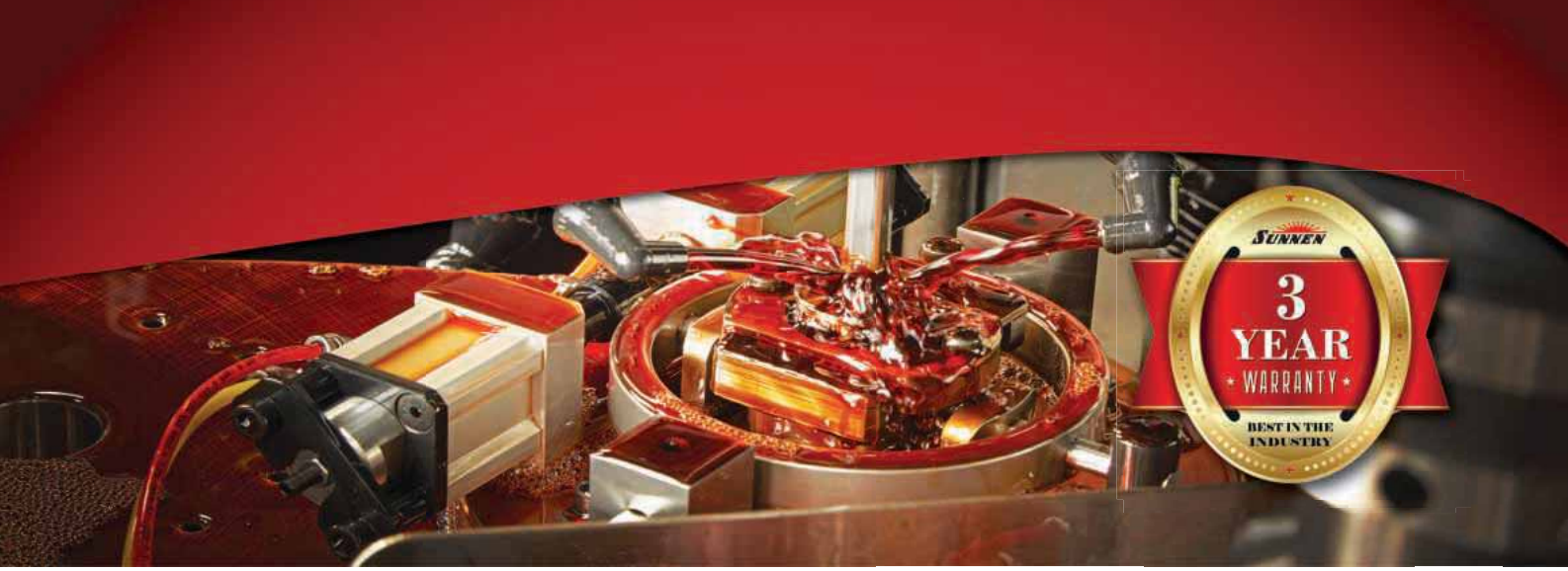

There's more than one way to machine a bore. **Only Sunnen has them all.**

No matter what your bore machining application...from primary hole drilling to final finished bores...we have a turnkey solution for you.

Deep hole machining. Our **BTA Heller** division manufactures industry leading tools and accessories for deep hole drilling, trepanning, counter boring, form boring, skiving/roller burnishing...even **Sandvik-style** replacement cutters, cartridges and pads.

Honing. From manual, tool-room hones to automated, high-production systems, Sunnen will optimize your honing process with a conventional multi-stroke or single-pass system designed specifically for your application, including machine, tooling, abrasives, cutting fluids, bore gages and automated parts handling.

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

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

FOR MORE INFORMATION CONTACT SUNNEN PRODUCTS LIMITED AT 01442 39 39 39 OR VISIT SUNNEN.COM

SUNNEN®

ABOVE AND BEYOND **HONING**

Six models covered by Sunnen's new three year warranty program

Automatic step-and-repeat capability for in-line and V-block engine configurations

Six models available for both manual and automatic operations, handle bore diameters from 0.75 to 8.0 in., and all are covered by Sunnen's new 3-year warranty program.

The new Sunnen SV-30 honing series is the next generation in the line of legendary Cylinder King® machines. True to its heritage, it achieves expert results on engine cylinder blocks, cylinder liners and other engine parts that require honing. Six standard models include four step-and-repeat capability versions allowing automatic bore-to-bore processing for in-line and V-block configurations, reducing setup time and improving bore quality. In addition, two models are available with a manual X-axis. The SV-30's cylinder diameter range is 0.75 to 8.0 in (19 to 200 mm) depending on the tooling option, and the new Sunnen GH-LF tooling is required for automatic step-and-repeat operation.

With six new models in the series, the SV-30 can be tailored to meet the needs of manufacturers, job shops and automotive performance and rebuild shops. It includes a new PC control with simplified menus and storage for 1,000+ setups for quick and easy changeovers. When used with the wide range of Sunnen-made abrasives, tooling and coolants, the US-built SV-30 produces

ideal bore roundness and surface finish in a variety of part types and materials at an affordable price.

The new SV-30 also includes spindle reversal, standard bore oversize setup (.010"/.020"/.030") and automatic tool protection at the top and bottom of the bore, which verifies an unobstructed stroke before starting a cycle. Models include either a variable-speed 6 hp (4.5 kW) servo or 5.5 hp (4.1-kW) induction spindle motor, producing speeds from 50-600 rpm. A 3.4 hp (2.5 kW) servo ball screw system produces up to 100 true vertical strokes per minute with a stroke travel of up to 27.75" (705 mm). The linear stroking drive maintains concentricity with the bore throughout the full stroke to produce a consistent diameter from top to bottom. A large, 48" x 30" (1,219 mm x 760 mm) work envelope allows versatility in processing larger parts.

The new spindle reversal feature duplicates the capabilities of machines used by automotive OEMs. "Reversal can be used anytime in the process, but is especially helpful during the finishing strokes," says Phil Hanna, Sunnen product manager. "Reversal helps create a slightly rounder bore and aids in achieving the desired surface finish. It causes the honing stones to take out any less-than-round shape left after initial passes, while shaping up and dressing the stones themselves. Reversing the spindle also aids in removing folded-over metal and cleaning debris out of the valleys of the surface finish."

The proven Phoenix industrial PC control ensures automatic, consistent bore-to-bore geometry and finish, without constant adjustment by the operator. The 15-inch (381 mm) colour touchscreen with intuitive controls provides a real-time display of the full-bore cross section during the process. The control can store 1,000+ part setup programs, and a USB port allows offline setup file storage. The control's programmable Auto-Dwell feature automatically corrects taper anywhere in the bore for unattended operation, while two-stage honing tools with diamond or CBN abrasives can complete roughing and finishing operations in one pass for high productivity.

Left/right positioning of the honing column on its 32-inch X-axis (813 mm) is easily accomplished with a servomotor or a manual hand wheel located immediately below the operator station (model dependent). The machine is equipped with a 55-gallon (208-litre) internal coolant system with two standard steel canister cartridge filters, heavy-duty pump, and filter status gauge.

In addition to the GH-LF tooling (required for automatic step and repeat operation), the SV-30 is compatible with all of Sunnen's current large diameter tooling. This includes diamond abrasive hone heads and brushes, GHSS single-stage hone heads with CBN or diamond abrasives and brushes, and GHTS hone heads for two-stage honing with CBN or diamond abrasives.

The SV-30 is equipped with new standard LED lighting in the work envelope. It also has the latest standard safety features including light curtain, interlocked front door, stainless guarding around the work envelope, and safety PLC which limits setup speeds in all axes. Options include a T-slot base (for custom fixturing), heavy-duty manual rollover cradle for engine blocks, and a full-feature automation interface.

The SV-30 is backed by Sunnen's three year parts and labour warranty and is sold and serviced as part of a total solution that includes Sunnen-made abrasives, tooling, bore gauges, and coolants.

Sunnen establishes direct sales in Canada
Starting in January 2019, Sunnen brings direct sales and service to Canada, providing an enhanced customer experience and full access to the company's total bore solutions. The move will provide increased access to customer service and offer the full support of Sunnen's corporate headquarters located in St. Louis, Missouri. All Canadian orders and customer-service requests will be handled directly by a staff of sales representatives and technical personnel located in Canada.

"This move brings us closer to our customer base and allows us to apply company standards to every aspect of the Sunnen experience in Canada," says Chris Miltenberger, president and CEO of Sunnen Products Company. "We've served the Canadian market for over 85 years through a distributor relationship. However, this move allows Sunnen to keep the focus on customers and the products and services that best serve them in this important market."

The Sunnen Canada team includes French and English-speaking sales and service representatives led by Gordon Baker, a 25-year veteran of international sales and marketing for Sunnen. "We have put together a group of individuals with many years of experience in honing and other bore sizing processes," he says. "Our representatives will work closely with customers, analysing application requirements, target tolerances, and process control needs in order to develop highly customised solutions to meet their specific needs. With the full backing of Sunnen we expect to continue to meet the high-standards of our Canadian customers." A new toll-free number (844-356-0006) is available for Canadian sales and customer service requests.

Sunnen has established direct sales in Canada. The management team directing Sunnen's sales and service within Canada include (L-R): Mike Molnar, Andrea Coghlin and Gordon Baker

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More than an extended workbench

Contract honing at Nagel

"Stick to what you know." This saying also applies for honing, as the quality of this finishing work is critical for the end result. This is where manufacturers such as NAGEL enter the fray, with honing activities for customers using internally developed machinery and tools.

Of course, NAGEL Maschinen-und Werkzeugfabrik GmbH, from Nürtingen, prefers selling its products. But, sometimes the purchase of a honing machine is out of the question. That's when Dipl.-Ing. (UAS) Markus Weber, the contract honing division manager at the Metzingen plant, and his team jump into action. The reasons for this differ. "We are often asked to help with insufficient or excessive quantities or very complicated components," he says. "The orders themselves come from a variety of industries."

Precision down to the µm level

The work often involves large lots for which Nagel has to use highly automated production processes. The team from Metzingen frequently also takes over the washing of the parts and the statistical process control (SPC). However, the company also manufactures smaller lots and single parts for customers that do not necessarily come from the automotive industry. The range is diverse: from engine blocks through to conrods, hydraulic cylinders and small control casings, all of which require absolute precision. The diversity in the non-automotive sector is just as high: one day it might be a four-tonne press table, the next, tiny punching sleeves with an external diameter of 8 mm and an internal diameter of 2.3 mm.

The components honed in Metzingen are characterised by a high level of dimensional and contour accuracy as well as optimised surfaces. "We effectively hone everything for everyone," smiles Markus Weber: "We recently even machined glass cylinders." Currently in Metzingen, ten employees operate 13 honing machines in single-shift operation. The department can, however, switch to rotating shifts if this is necessitated by the order volume. The department in Metzingen essentially operates like an external job shop with more machinery than employees to cover a range of different component requirements.

Machining using internally developed production technology

There is a key difference to a job shop, however, which works with external production technology: NAGEL uses internally developed and manufactured machinery and tools. "As a result, we have a better understanding and mastery of honing processes than other companies," explains the department manager. "In addition, all of the honing technology, including the spare parts, are always available in-house." This is a particular benefit with the constantly changing orders, such as from medical technology, the glass industry or press manufacture.

Besides the high demand for quality and precision, some of these industries are united by another common denominator: they hone parts for which the component related measurement results must be documented for every single workpiece. "For example, this is an obligation that we need to meet for the engine blocks and compressors," says Markus Weber. "The components have their own serial number,

which we generally record by scanning the barcode." This involves a 100 percent inspection, which allows the dimensional accuracy of every component to be tracked. Besides the inline process monitoring during the process, NAGEL also operates a high-tech quality assurance area using Zeiss and Mahr metrology as well as other tools.

How do you hone glass cylinders?

An order from the glass industry particularly roused the specialist's interest, as it went beyond the otherwise standard contract machining activities. Weber's team had to machine dosing cylinders, which were susceptible to breakage if, for example, they happened to be clamped incorrectly. In addition, the glass also had to be completely transparent after honing. "We developed the necessary process, including the handling, ourselves, manufactured the devices and moved through the stages of the test production of prototypes and pilot production until everything was ready for series production," recalls Markus Weber. "The customer then received a customised honing machine, including the honing process." It was an extremely delicate matter, as the dosing cylinder contained a ceramic piston, which can operate without a seal thanks to the exceptional honing precision down to the µm.

This example shows that Nagel's subcontracting department is more than a typical extended workbench; it is a resourceful problem solver. For instance, the automotive industry likes to get Nagel involved in a early phase of product development to assess feasibility among other things. The company received a special order from a renowned sports car maker, according to Markus Weber "we are the only company in Europe who were willing to take on the task." He adds: "We are effectively involved in the development of new conrods from the very beginning of the process and we also develop the honing processes. There is a good chance that our main plant in Nürtingen will develop a new machine concept to fit a process, which subsequently enters series production worldwide."

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Boneham & Turner chooses Delapena

Boneham & Turner celebrated its 100-year anniversary last year and is a leading manufacturer and supplier of tooling components and precision engineered components in the UK. The Mansfield-based company prides itself on reacting to customer requirements, maintaining imperial and metric stocks of over 350,000 jig and drill bushes and over 1.3 million dowel pins.

Quality is at the forefront of everything that Boneham & Turner represents, not only the products it produces but the suppliers it chooses. One such supplier is Delapena Honing based near Cheltenham.

Managing director Peter Boneham says: "Celebrating our 100 years in business was a very proud moment. I am fourth generation managing the business alongside my cousin. In the 100 years many things have changed, but one thing has remained constant and that is our focus on quality and innovation."

Boneham & Turner works in many sectors including F1 motorsport, aerospace, general engineering, composite industries and plant. Honing has been carried out in-house for over 70 years. However, over time this became very reliant on one person within the business and when they retired much of the knowledge was lost. The company looked for a solution that would mean that less knowledge was needed to carry out honing tasks.

Boneham & Turner chose Delapena Honing to partner with and ordered three Delapena SpeedHone EAS machines.

Delapena Honing will soon be celebrating 100 years since its formation and supports every aspect of improving surface finish, from feasibility on a part, to specification and new machine manufacture, to special tools and services.

"We chose the Delapena SpeedHone EAS because of the machines capability," explains Peter Boneham. "It's very easy to set up, simple for new operators to be trained and is a very high precision machine that achieves the tolerances and concentricities that we require for our drill bushings. Another key for us was that the Delapena SpeedHone EAS is a lot cleaner and much safer than the traditional hones you would see in our industry."

Boneham & Turner was attracted to Delapena firstly for the efficiencies that the SpeedHone offers, but another key factor was the knowledge that the Delapena team provides through their vast knowledge both on the ground and at their head office in Cheltenham. It is this complete service that lead Boneham & Turner ordering three machines and consignment stock.

"Delapena is a very supportive company," continues Peter Boneham. "We have a commitment from Delapena in terms of the tooling and helping us continually improve our methods. We also have a consignment stock of tooling that really helps us to manufacture profitably and efficiently."

The SpeedHone is a compact machine with considerable flexibility and capability. The honing process becomes deskilled and offers both a semi-automatic and manual operation. The SpeedHone is ideal for one off and batch production work, honing diameters from 1.14 mm to 80 mm with an increment of one micron.

Delapena Group has every facility required for honing, including an application centre, subcontract honing department, tooling refurbishment centre and a reverse engineering tooling centre. The company has built a reputation over the past 90 years for high quality products, great service and value.

Peter Boneham pictured with Steve Hunt from Delapena Honing

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V line - new flexible honing machine

In the honing process, if the workpiece spectrum is large and the numbers vary a variable machine is required. For this situation KADIA has developed the V line. The Vario honing machine is a flexibly configurable honing solution with two or three honing stations.

The machine fits between the 2-spindle universal machine U line and the R line equipped with up to six spindles and takes over their strengths. The structure is very compact, just like the U line with integrated control cabinet. From the R line it has adopted the proven rotunda design: all stations are located on a central pillar and are thus optimally accessible.

Thanks to the generously dimensioned working space with ring table for workpiece transport, the V line is suitable for a wide range of applications, for small to large workpieces, for example from injection pumps to gear wheels and hydraulic parts. The user has up to eight stations available, for honing, pre-inspection, measuring, deburring and other processes. In addition, the concept allows the integration of diverse automation solutions.

Last but not least, the V line is also equipped with KADIA Smart Dynamic honing technology components, with the intelligent HMC100 honing control with statistics module, optional bore scanning and highly dynamic, directly driven LH2 or LH3 honing spindles. The user also receives the typical KADIA five year warranty on the linear actuator.

KADIA Produktion GmbH + Co was founded in 1959 and specialises in both honing and mechanical deburring technologies. You will find KADIA honing and deburring systems wherever precision plays a decisive part in production, at the major automobile manufacturers and their automotive component suppliers, in the hydraulics industry, in agricultural machinery construction, at wind power manufacturers and in the defence and aerospace industries.

A full system supplier, KADIA provides customers with a single source for complete

machining solutions, from initial design and optimal machine and tool technology all the way to outsourced job production and after-sales service.

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History meets innovation

The FLP Group is a system provider for planar surface machining for industrial fine grinding, lapping and polishing

With its headquarters in Germany close to Berlin and Leipzig airports, this tradition-steeped family company with decades of experience has developed into a modern, dynamic, internationally operating company. The foundation of this development has been market intimacy, consistent customer orientation and innovative capacity.

Customers can reap the benefits of this collective expertise and experience as a system provider with close integration between machine design, machine manufacture, tooling development as well as micro-chip removal and worldwide international trading.

Single-wheel machines

The FLP SINGLE PRECISION series is a machine series for implementing fine grinding, lapping and polishing technologies in all materials and a broad spectrum of dimensions.

Proven designs and long years of experience in precision machine construction have been constantly refined in the development of this FLP series.

The modular construction enables customer orientated solutions to be provided economically, from the standard execution to special machines with high-end solutions and automation.

SINGLE PRECISION – the fourth generation

The fourth generation FLP SINGLE PRECISION series is distinguished by a modern design, an oscillation and vibration-free base frame as well as an adjustable loading table with optimised ergonomic standing workstation requirement.

Pneumatic load units, ultra-precise dosing systems, loading and offloading units, positive drives, adjustable working wheels, PLC controllers for process optimisation and control with program storage, load increments, cooling and effective temperature control, filtration and special design customer solutions can all be provided as options.

The most notable features of the single wheel lapping machine are the integrated control column, the ergonomic operability and the barrier-free handling even of sophisticated plants.

Two-wheel machines

Fine grinding, lapping and polishing on high precision double wheel machines with the highest degree of rigidity and oscillation reducing structures are what distinguish the newest worldwide concept of the FLP HIGH PRECISION modular series. The patent application by Thomas Rehfeldt rounds off the innovative character of the machine construction concept.

The monolithic portal construction using the strongly damping material granite, as well as the closed guide are guarantees for absolute running smoothness without component oscillation and vibration. Thermally stable tool carriers, special non-wearing bearings and active flushing of the micro-gap by incorporating the cooling system form the basis for new processes.

Materials and complex geometries are often difficult to clamp and the "FLP HIGH PRECISION" product line has been conceived for these demanding tasks.

High rpm, high chip removal volumes, highest levels of surface quality and dimensional accuracy, short process times and reliability due to sophisticated optimisation represent the fundamental advantages of this series.

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Precise and repeatable results at an economical price

Lapmaster's new range of dual face lapping and polishing machines is a small but versatile bench mounted and floor standing machines ideally suited for small workshops and laboratories and optical manufacturing.

Designed and developed and manufactured in the UK, this brand-new Lapmaster Wolters line of dual face lapping/polishing machines is based upon a two-way planetary concept designed to yield very precise and repeatable results at an economical price. Excellent results have been obtained in the processing of a wide range of materials and components including glass, ceramics, crystals and ferrous materials. Only the inner and outer gears rotate, allowing the carriers to move around the surface of the plates, whilst the top and bottom plate stay stationary.

The machine is designed to lap and polish components on a five-carrier format. The components are placed in an offset position in the carrier to ensure full coverage of the lapping plate.

The machine structure comprises a lightweight steel base which carries the main drive components and the drive motors. The machine has two drive motors, each separately and independently controlled. Each drive system is mounted in fully sealed ball race bearings to allow the smooth running of the lap plates.

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 65 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. It takes Lapmaster Wolters, your partner in precision surfacing technology.

Since 1948, industry has relied on Lapmaster Wolters to solve the most challenging precision surfacing problems. With over 65 years of experience, Lapmaster Wolters has a proven history of successfully developing cost-effective processing solutions for virtually any application.

Whether its precision sizing, flatness, parallelism, or surface finish that's required, Lapmaster Wolters has the solution.

Lapmaster Wolters
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Master Abrasives now representing Microdiamant

Master Abrasives has been appointed the UK and Ireland representative for the range of diamond products for fine grinding, lapping and polishing applications manufactured by Microdiamant AG, based in Lengwil, Switzerland.

Over the past 60+ years, Microdiamant has been continuously optimising and reinventing micron diamond with customer needs as a constant focus. The company has identified that only the combination of the best product and Microdiamant's extensive industry know-how leads to the perfect solution. Microdiamant is a privately held company that distributes its products through a network of specialised agents, with subsidiaries in approximately 20 countries across Europe, USA and Asia.

These types of diamond products are not something Master Abrasives has focused on in the past, so the Microdiamant product range now gives the company an opportunity to offer customers these products in the highest quality. Microdiamant manufactures diamond products in all common diamond types; natural, monocrystalline, polycrystalline and nanocluster, and in diamond sizes ranging from 18 nanometres up to 100 microns.

The products added to Master Abrasives superabrasives range can be split into a few categories, the first being Micron Diamond Powders for the superfinishing of hard materials with demanding specifications for surface quality and dimensional accuracy. Micron Diamond Powders are offered in a comprehensive product range in micron and sub-micron size range, and in synthetic and natural diamond.

Secondly Microdiamant offers Diamond slurries for various industries for lapping and polishing of hard materials. Microdiamant offer both engineered and ready-to-use diamond slurries. Engineered slurries offer flexibility to adapt to the exact product needs to achieve optimal performance, process stability and cost-effectiveness. The ready-to-use diamond slurries combine highest-level of precision graded micron diamond sizes with chemical formulations designed to offer exceptional removal rate and surface quality. They also enable customers to achieve high performance but help to minimise total process cost.

Microdiamant also offers liquid diamond GAF's, diamond compounds and grinding pads, composite polishing pads, polishing pads and metallography products as other sections of their extensive product portfolio.

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Magnetic solution combats metal swarf in creep feed grinder

Eclipse Magnetics has provided a hack saw blade manufacturing facility in China with a magnetic filter as the first line of defence against metal swarf.

A creep feed grinder is used to manufacture the hand hacksaw blades from M2 steel. Eclipse Magnetics installed the AutoMag Skid on the grinding machine at the very first stage of the filtration process to capture and remove ferrous particles from the coolant, therefore keeping it cleaner. The reduction in contamination reduces the risk of wear, damage and failure in critical components.

In addition, the AutoMag Skid effectively removes the contamination before it reaches the paper filter, preventing it from clogging up and needing to be replaced frequently. Acting as a primary filter, the magnetic filter takes out the metal contamination, therefore extending the life of the paper filter significantly, in turn saving money and reducing waste.

The magnetic filtration solution has only been installed in the new machine for a matter of months, but it has made overall improvements to efficiency. A significant amount of ferrous contamination is now being removed from the coolant, meaning that the waste can be recycled due to the high steel content, or adequately disposed of in an effective waste management programme.

As part of the Spear & Jackson Group, Eclipse Professional Tools manufactures its 'Predator' range of hand hacksaw blades at the HSB plant in Jiangmen, South China.

The magnetic filter removes almost all the ferrous contamination from the system, in turn greatly reducing the amount of material collecting on the paper filter. This means that the paper use and frequency of its replacement is greatly reduced.

David Liang, general manager at Eclipse Tools Jiangman, says: "The AutoMag Skid has definitely enabled our operators to improve efficiency. When compared with other paper filtration methods, the AM6 not only improves efficiency it also saves costs. It is a maintenance free machine."

The large, powerful grinding machine used to make the hacksaw blades facilitates full depth of cut and uses a synthetic, water-based coolant to facilitate the manufacturing process. With a 3,000 litre fluid tank, flow rates are approximately 160 litres per minute and operate with 10 bar of pressure.

The AM 6 AutoMag filter unit boasts six magnetic cores and a maximum flow rate of 450 litres per minute. With a contamination capacity of up to 7 kg, it has a maximum operating pressure of up to 10 bar. This effective self-contained filtration and fluid recovery system has a fully automated operation which minimises fluid loss during cleaning and is ideal for the company's creep feed grinding machine.

The AutoMag Skid has been installed on the creep feed grinding machine at the very first stage of the filtration process. The majority of the ferrous contamination generated by the grinding process is made up from steel swarf created during the manufacture of the hand hacksaw blades. Contamination generated by the natural wear and tear of the aluminium oxide grinding wheel, however, is not magnetic. This fine, non-ferrous contamination, therefore, is removed from the coolant afterwards using the paper filter.

The AutoMag Skid removes magnetic and para-magnetic contamination, down to submicron size, from the coolant used in Eclipse Tools' creep feed grinding machine. The filter holds the contamination until it is released during the automated 'purge' process, which briefly diverts the filter's purged output so that fluid carries all the contamination to the buffer tank. The buffer tank then feeds the contaminated fluid to the high-intensity coolant roller and the magnetic coolant roller removes the contamination from the fluid. The clean fluid is then put back into circulation, and the contamination is extracted in a form ready for disposal or recycling.

As a result of the magnetic filtration, the coolant is much cleaner. With fewer contaminants circulating around the grinding machine, critical components such as the pump are at reduced risk of wear, damage, and failure. The AutoMag Skid also extends the life of the paper filter significantly, effectively collecting and removing the vast majority of contamination before it reaches the paper filter. The result is that the paper filter needs to be changed less frequently, not only saving money on replacements, but also reducing the environmental impact of disposal.

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Get the most out of your coolant with ultra-fine filtration

Extract the last bit of recyclable material out of your coolant

Reliable filtration of cooling lubricants is very important for the successful manufacturing of grinding tools. High-quality cooling lubricants and their filtration are prerequisites for high product quality, economy, and trouble-free production. The filtration system manufacturer VOMAT from Treuen, Germany supplies high-performance filter technology for exactly this purpose. The FA-series machines are designed in such a way that they provide the machine tool system, with nearly fresh-oil quality meeting NAS 7 purity over a long period of time. Engineering solutions for easy and trouble-free disposal of recyclable materials make these machines optimal work companions.

Steffen Strobel, head of Technical Sales at VOMAT says: "Our systems are ideal for the filtration of ultra-fine particles from oil such as those produced during grinding, honing, lapping, eroding, and other metal working processes. The secret of our success lies in the multitude of engineering first's hidden under the machine hood."

VOMAT uses long-life high-performance pre-coat filters and, if required, HSS pre-filters for mixed processing of carbide and HSS. VOMAT separates clean and dirty oil 100 percent in their full-flow filtration process. Flushing and filtering takes place as required with an automatic back-flush cycle dependent on filter contamination and is therefore optimised for energy savings. Cooling systems, specifically designed to customer requirements, keep the fluid temperature in a tight range thanks to highly precise temperature controls. VOMAT filters are low-maintenance and require very little of your valuable production floor space due to their compact design.

Steffen Strobel adds: "Another advantage of VOMAT's filtration system concept is the flexibility to adapt to various production requirements. The standardised FA series are offered in different capacity sizes and can be individually customised to meet a plethora of production requirements with the help of a wide variety of expansion modules such as machine pumps, supplementary cooling concepts, and more. This also applies to the sludge disposal systems."

Getting the most out of cooling lubricants thanks to material recycling

A standard feature is the collection and disposal of recyclable materials, such as carbide sludge, which is carried out by means of sludge bags. The low removal height (waist-high) is ergonomically advantageous and no tools are required for removal of the bags. The filtration system can continue to operate during the waste removal. Another possibility for collecting recyclable material is offered by VOMAT with its patented "Sedimentator". The carbide sludge is deposited directly into a suitable transport container (20 or 200 litre container) ready to be sent to a recycling company. The residual moisture content of the carbide sludge is around five to 10 percent.

When it comes to HSS pre-filtration, the swarf disposal is carried out by a vacuum belt and goes directly into transport containers which are ready for recycling.

Thanks to the "Sedimentator" developed by VOMAT, the carbide sludge is automatically processed and deposited in a user-friendly manner directly into a suitable transport container for the recycling company.

In pre-filtration of HSS swarf a vacuum belt is used. Its advantages lie in the better filtration and swarf drying performance. Again, the recyclable material is directly deposited into containers specified by the recycling company.

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In-house N2/O2 generation pays dividends

Any company looking to invest in the latest high-purity, low-energy nitrogen and oxygen generators should look no further than the latest series from Hi-line Industries. Hi-line's N2/O2 generators use simple Pressure Swing Adsorption (PSA) technology to help ensure there is no longer any reason to pay for bottled gas or bulk nitrogen/oxygen tanks ever again.

Generating on-site nitrogen and oxygen is a safe and simple process, and while nothing is for free, the potential savings to be made against bottle/tank deliveries are staggering. However, an N2/O2 generator needs to be correctly specified if the gains are to be maximised.

Hi-line N2 generators utilise completely different control technology to traditional PSA N2 generators. A variable speed type technology is used, where the generator only runs when the process is calling for N2 and, when no N2 requirement is needed, the Hi-line generator goes on to stand-by. On start-up, N2 at the exact purity required is delivered due to a buffer/polishing tank along with a high purity storage vessel on the skid, meaning no down-time whilst waiting to reach purity, unlike some technologies.

Bottled gas is sold at high pressure to enable smaller footprint and regulated down. However, if you need a 30 - 40 bar application, then Hi-line can add a booster to the skid to give you the exact pressure required at your process.

The cycle is therefore continuously producing high-quality nitrogen, 24 hours a day. Used correctly, the CMS is fully regenerative and has a life span over 40,000 operational hours.

Nitrogen gas is used in a wide range of industries where safe, inert environments are required, such as the petroleum, chemical, pharmaceutical, paint and varnish sectors, as well as in the production of ferrous and non-ferrous metals, together with electronic and glass products.

Aside from the huge cost advantages available, there are a multitude of advantages associated with in-house N2/O2 generation, not least independence from third-party gas supplies and market price

fluctuations. There is also the elimination of logistical tasks associated with bottles or liquid nitrogen, as well as the management of suppliers. In addition, the equipment is modular and flexible, and has very low maintenance requirements.

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High quality deburring and surface finishing

Rural Northern Ireland conjures up images of hills, meadows, farms, dotted with flocks of sheep and herds of cows. However, not all the buildings scattered across this landscape are barns or even intended for agriculture at all. It's hard to tell from the outside, but some of these buildings contain high-tech metal and sheet metal processing businesses of cross-regional importance. High-tech hiding behind plain façades!

Two typical examples of this phenomenon are Moyfab Engineering Ltd in Kilkeel and Currie Fabtech Ltd in Garvagh. Both came from humble beginnings as repair shops for agricultural machinery and have meanwhile developed into specialists for sheet metal processing, supplying two entirely different industries with their products. The Moyfab courtyard is still filled to burst with great stacks of agricultural equipment for sheep and cattle farming, the products that started it all. Everything is a little tight, as lorries are also waiting to be loaded for transport. Business is booming, Moyfab is highly successful.

The business was first launched 26 years ago, when senior partner Hugh Fitzpatrick began to offer repair services alongside his work as a teacher. In addition to these simple repairs, the business began to develop and produce more and more agricultural equipment for its customers and today it provides an entire product range for sheep and cattle farming. At the same time, the necessary machining options were established and a small machine outfit was obtained. For sheet metal machining, it consisted of one set of guillotine shears and two press brakes. Six years ago, Raymond, who manages the business together with his brothers Shane, Ciaran and Stephen, decided to expand their production options beyond sheet metal machining by buying a second-hand laser cutting system. This system opened up new options for production of the different components. A conversation with an aircraft component design engineer gave Raymond the idea of expanding the business to also include these parts and try his luck in a new market. So Moyfab began to produce parts and non-load-bearing components for aircraft interior design, such as seats or kitchens.

Today, Moyfab parts can be found in aircraft of all well-known aircraft operators, though hidden in whole seats or kitchens. Success came fast and the company's production had to grow rapidly to keep up with it. To meet the great demand, Moyfab is currently in the process of setting up its third fibre laser and is planning to put its fourteenth press brake into operation by the end of this year. In addition, the machining quality demanded by the new customer base was higher. It now also includes deburring and rounding of the edges of laser-cut pieces.

After its first deburring machine did not meet these demands, Moyfab continued its search and finally learned about WEBER and its deburring technology. The rounding results delivered by the WEBER planetary head were convincing. As Moyfab produces a wide range from small to large pieces, process reliability for smaller pieces was particularly crucial. WEBER technology easily manages to meet these requirements as well. This made Moyfab decide to buy a

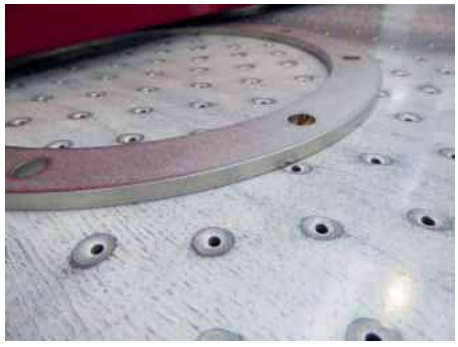
WEBER TT with a grinding roller for deburring and surface grinding, as well as a WEBER planetary head for edge rounding as a second station. The grinding system, which uses dry grinding techniques and is used for mixed operation on stainless steel and aluminium sheets, was supplied completely with the necessary extraction system and pipework as well as commissioned by WEBER.

WEBER grinding machines are characterised by simple, user-friendly operation using a SIEMENS touch panel and precise, reliably reproducible grinding station settings. This ensures the quality and evenness of the grinding results. The grinding roller is adjusted by motor power with an accuracy of less than a tenth of a millimetre. The patented planetary head guarantees perfect rounding results and can be adapted as required with regard to grinding pressure, approach and cutting speed. This means that ideal settings can be found and, if required, archived in the control system, even for the sheet thicknesses machined here, which are usually between 1 and 2 mm. The tools in use are freely available in the market, so the customer can pick their own supplier.

This WEBER product package convinced the customer that it has made the right decision. "First-class installation", was the verdict of Raymond, who has been responsible for building up and is now overseeing this area of operations at Moyfab. To prepare for the future, the company intends to install another WEBER deburring system with an operating width of 1,600 mm next year. As production has doubled each year, this is a logical step for the company of now 80 employees, which has, for years, been divided into chipping processes and die casting on the one hand and sheet metal machining on the other.

Meanwhile, the original Currie Engineering was started by John Currie's father Ian in 1981, primarily as a repair shop for local farmers and local quarries etc alongside of the design and manufacture of agricultural machinery. When John joined the family business, it quickly moved forward into the design and manufacture of high-tech bespoke machines for production lines in the electronic, medical and tobacco industries. The stainless-steel guarding on these high-tech machines had to be outsourced but unfortunately the quality was not of the standard required therefore John made the decision to manufacture these guards himself and thus the fabrication end of the business was born. He decided in the year 2000 to buy a set of guillotine shears and a press brake to manufacture these sheet metal parts himself. Two years later, these machines were followed by the first laser cutting system. John had quickly realised that there was a market with other local companies who required quality, contamination free, non-ferrous metal cutting. These companies covered a number of sectors, including construction, agri-food, security, chemical and transport to name but a few.

Although producing high quality laser cut and folded components, John Currie realised he could further improve the product by high quality deburring and surface finishing. While trying to find a



suitable machine, John came across WEBER at the Euroblech 2016 trade fair. There, he was impressed and persuaded by the deburring results and the quality of WEBER machines. Today his business, which split off from Currie Engineering in 2017 and employs 14 people, focuses on machining non-ferrous metals cut to a thickness of up to 40 mm. For John, a perfect edge quality is vital both in cutting and in edge rounding. That's why he decided to get a WEBER PT with a grinding roller for pre-grinding and surface grinding and a multi-rotation brush head MRB for reworking and edge rounding. This head can machine even sheet steel parts that are only a few tenths of a millimetre thick. It is also suitable for grinding cut faces of components with a thickness of up to 20 mm. In WEBER MRB systems, several rotating brush heads are arranged next to each other with overlapping circles of rotation. This overlap of machining sections ensures that all edges are evenly rounded. At the same time, the MRB head has a compact build, allowing problem-free combination with other machining stations without the machine getting excessively large. Here, too, WEBER supplied and installed the complete system including an extraction system, confirming John Currie's decision.

He was thoroughly impressed by the training and support given during installation.

The two WEBER customers Moyfab Engineering and Currie Fabtech show how humble beginnings can develop into specialised companies, who have found their perfect partner in WEBER and become established and successful in the market through WEBER machinery. Moyfab makes use of the planetary head, which can round even tiny parts reliably and perfectly, while Currie employs the multi-rotation brush system, which is particularly suitable for deburring extremely thin sheets and can simultaneously handle machining of cut faces as well as edge rounding on thick sheets, where this may be necessary.

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Timesavers handles production growth at AA Sheetmetal Ltd

The combination of improved laser processing and increased customer demand led to a bottleneck at AA Sheetmetal Ltd when it came to deburring and surface graining. Traditionally these were manual operations at the Norwich-based subcontract sheetmetal company, but increasing volumes demanded an automated solution, in the form of a Timesavers Series 32, abrasive belt and rotary carousel brush deburring and surface finishing machine with an 1,100 mm working width from Ellesco.

AA Sheetmetal was formed in 1987 by co-directors Alan Lappin and Alan Smith to serve the food packaging industry and commercial catering equipment sectors. This involved laser cutting flat sheet, forming, and welding stainless steel fabrications in relatively small batch quantities. Year-on-year growth saw the business develop, with three relocations to manage the expanding customer base over the years. With this growth came a requirement to invest, which saw the arrival of a flat-bed fibre laser to replace the older CO_2 machine.

"Everything we produce goes through the laser machine and the move to fibre gave productivity a massive boost. The result was more parts which all required edge finishing to some extent, and as this was done manually it put greater pressure on the team," says Alan Lappin. "This got us thinking about reducing the manual content of our deburring to improve workflow and reduce the health and safety aspect of vibration white finger due to use of manual air tools. Then, when a long-standing customer doubled the volume of work it decision to move to the Timesaver machine was made for us, as we simply couldn't have managed that volume with manual deburring and finishing."

A particular requirement of the food industry that AA Sheetmetal services is the need to ensure everything is spotlessly clean, which requires processing equipment to be cleaned down intensively and frequently. The nature of this equipment means a lot of manual intervention reaching into dark corners through slots and along edges. The rounded edges created by the Timesavers rotary brushes are therefore ideal, eliminating any risk to the operator from sharp corners. Additionally, the brushes will produce a non-directional finish if required; ideal for cleaning down with a pressure washer.

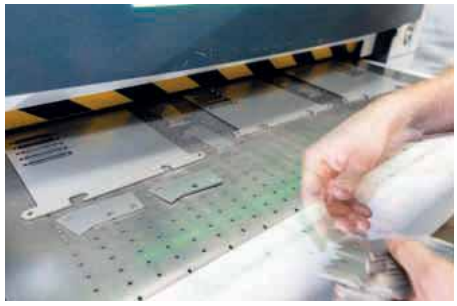
Convenient and easy-to-use HMI makes control of the Series 32 straightforward

The Timesavers 32 series machine at AA Sheetmetal is capable of automatically deburring, finishing, edge rounding and removal of laser oxide skin through its combination of wide abrasive belt and four rotary brushes. Thanks to the vacuum table, which features an integrated cleaning cycle, parts as small as 50 mm^2 can be processed without any manual input. Machine control is provided by the Siemens HMI located conveniently at 45 degrees on the front corner of the machine. From this, the operator can quickly set all of the machine parameters from grind height between 0 and 100 m and a table speed of 0.2 to 8 m/min.

From the control position the operator is also able to view the illuminated work area through the large window. The 32 series machines are ideal for burr removal on

The Timesavers Series 32 1100 WRb

Table speed and height can be set to suit specific workpieces



The vacuum table allows small parts to be processed automatically

laser-cut (including plastic coated, without disturbing the plastic), water jet, punched and guillotined edges. The machine can also process a wide range of materials including stainless and other steels straight onto a 'sticky' conveyor belt, and with the Timesavers' vacuum table, aluminium, copper and other metals that would otherwise require repeated, manual cleaning of the conveyor belt can also be processed.

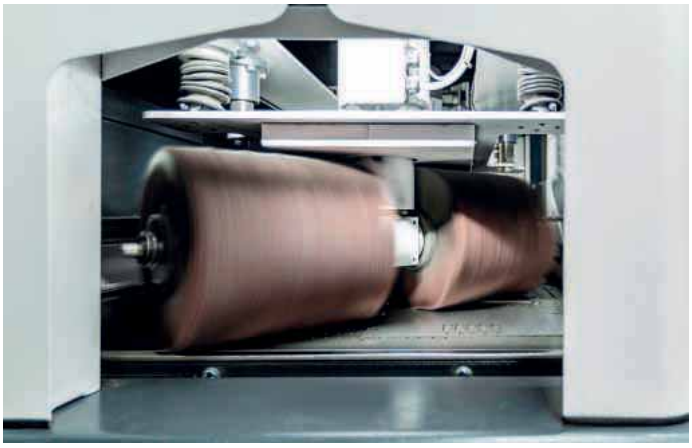
For the type of work being produced by AA Sheetmetal, final visual appearance is important, so the ability to produce consistent brushed finishes and corner radii is a major benefit. Additionally, the speed of the processing of parts through the Timesavers machine means that both sides of a part can be treated equally, so any visual inspection of a completed cabinet will show the finish as good on the inside as on the outside.

"We can now process batches irrespective of size and know that every part will look identical. Furthermore, it makes no difference how complex the part shape is as we know that every edge will be deburred/rounded to the same degree, and the fact that we can deburr plastic coated

material without damaging the metal surface is a major advantage," says foreman Simon Miller.

The secret behind this edge consistency is the Timesavers' Rotary Carousel Brush system that hits every edge from every-which-way. In processing material with this rotary motion, a consistent and equal edge break is achieved, as opposed to the older technology of twin brushes which only work with the flow of material or across it at 90 degrees.

In addition to the consistency and quality generated by the machine, the improved productivity was also vital as business continues to grow. "The Timesavers machine is the equivalent of having 10 people manually deburring," says Alan Lappin. "With its arrival these people are now free to use their skills more productively fabricating and welding finished assemblies. Deburring by hand is extremely time consuming and poses health issues from a vibration point of view and the environment. With the Timesavers having dust extraction the workplace is now dust free and operators no longer have any concerns over the potential damage that using hand tools can bring."



The four rotary brushes have a quick-change feature. The guard is open under supervision for photography purposes

The Timesavers machine was recommended to AA Sheetmetal by one of its customers that used a similar machine from Ellesco and this recommendation along with the versatility of the 32-1100-WRB convinced the two Alans that this was the right option for them. The ability to deburr and grain on the same machine in the same cycle gave them options when processing material. In addition, the ease of use of the Timesavers allows work to be set up very quickly irrespective of batch size.

What Alan Lappin describes as 'intense' training was provided to Simon and two others while the machine was being commissioned. Just 15 minutes was then spent by Simon passing on sufficient knowledge to set and operate the machine in 15 minutes to anyone else that needed to operate the machine. "That was all that was needed. It really was that straightforward and we know that the support is there at the end of the phone at Ellesco if we ever have any questions. Having the machine has given us the confidence to look for larger volume work in the knowledge that we no longer have that bottleneck when it comes to deburring and graining," concludes Alan Lappin.

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DeburringEXPO inspires exhibitors and visitors

"We're highly satisfied with the new trade fair and it's exceeded our expectations." Nearly all 108 exhibitors at the first DeburringEXPO in Karlsruhe arrived at this entirely positive conclusion. 2,038 visitors from 31 countries gathered information regarding the state-of-the-art and current developments in the areas of deburring, rounding and polishing during the three-day trade fair. Their outstanding technical qualifications and decision making authority resulted in concrete orders and top quality leads for the exhibitors. Furthermore, 1,473 visitors took advantage of the opportunity of deepening their knowledge by attending presentations held at the expert forum at the trade fair for deburring and polishing technology.

Taking place from 13th to 15th October, DeburringEXPO made a highly successful custom-tailored trade fair premiere. With 108 exhibitors from eleven countries (22 percent from outside of Germany), event promoters fairXperts GmbH & Co. KG succeeded in putting together comprehensive, representative offerings in the areas of deburring, rounding and polishing.

"Due to the fact that this was a premiere event, we came to Karlsruhe with minimal expectations and were pleasantly surprised," says Jürgen Mang from sales at Kennametal Extrude Hone GmbH.

"Feedback from the visitors was tremendous and practically every visitor had a concrete task in hand, for which a solution is required. Many brought components and drawings along with them, making in-depth discussions possible which resulted in tangible projects."

Lucca Schlichting, from barrel finishing sales at Rösler Oberflächentechnik GmbH, is also very satisfied with the way things went at the debut event: "We'll exhibit again at DeburringEXPO in 2017. As a globally leading company in the field of barrel finishing, there was no question for us that we mustn't miss out on DeburringEXPO, and participation has paid off. We had visitors from a great variety of industries, for example automotive, medical technology and casting, and each and every lead was good because they all involved definite tasks. At times it would have been good to have a bigger booth and more personnel.

It wasn't just the number of visitors that resulted in satisfaction amongst the exhibitors, but rather their high levels of technical qualification and decision making authority as well. 94.6 percent of the expert visitors are involved in company procurement processes.

For Costa Levigatrici S.p.A., an Italian manufacturer of deburring and polishing machines, this led to definite orders: "All of the visitors came here in search of solutions for their own specific deburring tasks, some of which have to be implemented on short notice. Consequently, we were able to sell two machines directly at the event and establish lots of very valuable contacts."

"It was a very successful trade fair for us and I think we'll exhibit again at DeburringEXPO 2017," explains sales manager Roberto Martini.

Gunter Gölz, managing director of Benseler Entgratungen GmbH, was every bit as enthusiastic: "We're very happy that fairXperts has initiated this platform. Our expectations have been more than exceeded. For us, it's been our most successful trade fair presentation ever so far, and thus there's no question that we'll be back again in 2017." For strategic business director Sitanshu Gupta as well, the decision has already been made that Imexsu Europe GmbH will be on hand at the upcoming trade fair for deburring and polishing: "We manufacture deburring products, which makes it extremely important for us to be represented at DeburringEXPO. The promoter has succeeded in making the right audience aware of the event – beyond Germany's boundaries as well. As a result, we not only had significantly more high quality leads than we expected, they were very international as well, for example from Poland, Portugal, Austria, Great Britain and even India."

The fact that the concept developed for DeburringEXPO, which is consistently aligned to the fields of deburring, rounding and polishing, was also well-accepted by the visitors, is not only illustrated by the exhibitors' positive reactions. 80 percent of the visitors were satisfied to very satisfied with the offerings presented at the first trade fair for deburring and polishing technology, and roughly 69 percent would recommend the event to their business partners and colleagues. With regard to visitor distribution, main focal points included vehicle manufacturing, machinery and equipment manufacturing, medical technology, as well as tool and mould making.

Expert Forum in demand

The Expert Forum was one of the highlights at DeburringEXPO. 1473 visitors took advantage of it during the three-day trade fair in order to expand their knowledge of various issues regarding all aspects of deburring, rounding and polishing, and to exchange experience. Roughly one third of the expert visitors chose the day on which they attended the trade fair on the basis of the agenda for the Expert Forum.

The all-in-all highly positive feedback indicates that the suppliers as well as the users of products and services covering all aspects of deburring, rounding and polishing are now at home with their trade fair in Karlsruhe. This is also confirmed by the fact that numerous exhibitors have already entered the next DeburringEXPO to their trade fair calendars, which will take place at the Karlsruhe Exhibition Centre from the 10th through the 12th of October, 2017.

Further information can be found at **www.deburring-expo.com**

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A clever combination

ARKU presents the multifunctional production line with new functions

All good things come in threes, including deburred surfaces. High-quality panels require the perfection provided by combining levelling, deburring and flatness measuring. ARKU presents the production line covering these three steps in hall 11, booth A94 at the EuroBLECH from the 23rd to the 26th of October. Visitors experience a new system for preventing pinched edges and the quick roller change in action.

The multifunctional, fully automated production line reflects a major part of ARKU's portfolio. In addition to the EdgeBreaker® 2000 Plus deburring machine, the system also includes the FlatMaster® 55 80 precision leveller and the FlatJack® automatic flatness control system. The three linked machines handle the key steps in the material preparation process: the EdgeBreaker deburrs and rounds both sides of the panels, while the FlatMaster transforms these into flat panels almost entirely free of internal stress. The ARKU SmartEdge feature of the precision levellers can almost entirely prevent pinched or damaged edges. In addition, the FlatMaster is also equipped with the RollerPickup® quick-change system. This motorised system extends and retracts the levelling rollers and support rollers. It shortens the times needed to fit and remove the rollers, therefore reducing downtime as a whole. As a result, the RollerPickup supports the rapid cleaning of the levelling rollers.

At the end of the line, the FlatJack flatness control system checks the flatness of the pieces. This results in high-quality panels suitable for even faster and easier processing. A central computer serves as a variable customer interface (VCI) and enables the systems to communicate and coordinate their activities with each other.

Levelling, deburring, flatness testing: the production line presented at the EuroBLECH covered multiple production steps

Higher efficiency

"Our production line enables shorter cycle times and more efficient processes as a whole," explains ARKU's owner and managing partner, Albert Reiss. As such, the complete production line has a positive effect on customers' financial and operating figures.

At ARKU, efficiency has been a key focus for 90 years, for both the company's own production and its customers' projects. "Over the years we have constantly initiated new developments", emphasises Albert Reiss. "These have shaped the industry itself and made ARKU the market leader."

Founded in 1928, ARKU is a world leader in roller levellers and press feeding technology, with the world's most extensive range of high-capacity and precision levellers and with more than 50 years' expertise in the field. The company also offers innovative deburring and edge rounding technology.

With its headquarters in Baden-Baden, Germany and ISO-certified facilities in Kunshan, China and Cincinnati, USA, the business operates in almost 30 countries worldwide. The product range comprises precision levellers, deburring and edge rounding machines for parts, cut-to-length and slitting lines, press feeding units and press feeding lines and coil preparation lines for roll formers. ARKU provides engineering expertise to many manufacturing industries, including automotive, railroad equipment, shipbuilding, construction and furniture, as well as laser job shops and others.

Hands-free: the fully automated production line simplifies work for the operators and ensures shorter production times

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GT Grinding stays ahead with Walter Ewag

Specialist grinding company stays ahead using Walter Helitronic tool grinders and tool studio software

GT Grinding's continual quest to meet a growing order book and to improve service delivery levels in the manufacture of special-purpose tooling, as well as tool regrinds for customers across the UK and in all industry sectors, has led the tooling specialist to invest in a Walter Helitronic Power tool grinder.

Supplied by Walter Ewag UK, a member of the United Grinding Group, the machine is capable of processing rotary tools from 3 mm to 320 mm diameters and up to 350 mm long.

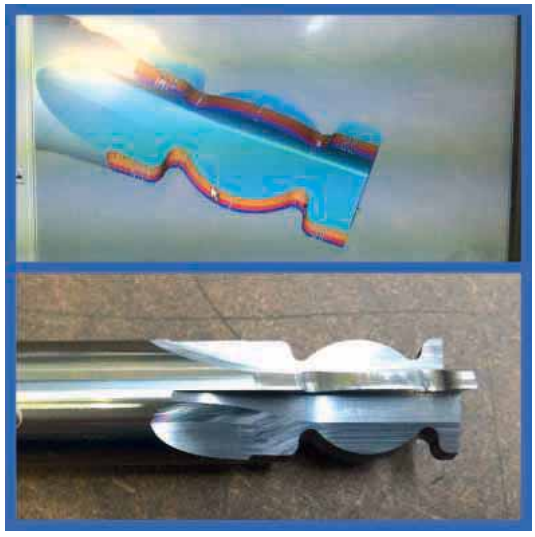
Complementing three other Helitronic machines at the company's Oldham site, the new Power is equipped with an Eco Loader and wheelchanger, as well as the latest version of Walter's Tool Studio programming software, to ensure that GT Grinding "stays head in the design, modification and grinding of rotary tooling," according to Works manager Andy Cooper.

He adds: "This latest machine will undoubtedly also help us to make further inroads into our manufacturing and regrinding operation, especially of routers for the woodworking and plastics industries. And the Tool Studio software will play a key role, too."

With integrated Wizard technology for ease-of-use, Tool Studio 3 includes a host of new routines for 'what you see you can grind' fast tool production simulation, parameter changes and operation for Helitronic Power users. New functionality is included for:

- Thread milling cutters: diameter/flank grinding and OD grinding
- Pocket extensions: import and grind DXF pocket shapes
- Cut-off operations: compensating for worn wheels
- Probing and alignment of asymmetrical flats: more functionality to define probing points/probe the exact position for perfect alignment
- In-process wheel measurement inside the machine
- Core compensation for long tools: core parameter and tolerance band
- Automatic machine axis referencing: using setting disc with electrical isolator
- Coolant hole detection with camera

When such powerful yet such easy-to-use software is combined with the benefits of automatic non-stop production via the Eco Loader, which is located on the machine work table and can accommodate 20 tools as standard and up to 165 tools in the Eco Loader Plus configuration and the integrated wheelchanger (up to eight wheels), then the multi-axis Helitronic Power is a formidable production ally in the war against non-productive time.



In GT Grinding's case, this includes the machining of solid carbide and HSS tools such as special form cutters and slitters as well as 'conventional' drills, milling cutters and reamers.

Andy Cooper says that he and GT Grinding have a long-established history of more than 30 years of using Walter tool grinders and while he "always visits the biennial GrindTec exhibition to keep track of all machine developments," he still always returns to Walter.

He says: "In addition to being machines that actually do what they say they can, the fact is that Walter Ewag UK provides a great level of service back-up. Knowing that any issues with the machines and the software can be addressed very quickly is a great weight off my mind when my main aim is to get quality products out of the door.

GT Grinding's latest Walter Helitronic tool grinder will undoubtedly help the company "make further inroads into our manufacturing and regrinding operation, especially of routers for the woodworking and plastics industries."

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New developments at SCHNEEBERGER

New demo room in Roggwil
Construction of the new show room at the SCHNEEBERGER headquarters was started in 2017 and has now been commissioned.

Light ambience in the new demo room Part of the tank system in the cellar of the new building

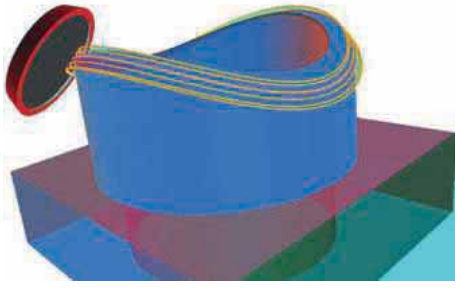
The new, well-lit space fits seamlessly into the existing company building. The 400 m² exhibition area is now able to present the newest generation of the SCHNEEBERGER grinding machines. The new space will also be used for customer training and application development. The foundation was generously designed to carry the heavyweights from our machine range, as well. The most modern cooling, heating and air cleaning technology, combined with LED light installation ensures a pleasant environment.

In order to supply the machines installed in the demo room with cooling lubricants, power and compressed air, 12 pumps with 24 connection spaces including power boxes and supply tubes were installed. 230V power and LAN outlets are also integrated in the GIFAS boxes. The central supply units, compressor, and coolant filter system are integrated within the newly built basement, while the supply hoses and tubes lead into the ground floor through corresponding openings. This installation enables speedy, simple connection and smooth supply of maximum 24 grinding machines. The clean oil tank has a capacity of 3,000 litres and features a battery of 16 cartridges for pre and end filtering. Two separate pressure circuits for process and motor cooling generate 17 and five bar at a volume flow of 2,50 l / min for process and motor cooling.

Connected and supplied in a few minutes

Extended STEP Interface in Qg1
SCHNEEBERGER's own STEP* interface in its Qg1 grinding software has already been presented many times at trade fairs, to in-house visitors and the company's numerous representatives. Extended functions are now available that make the possibilities even more exciting.

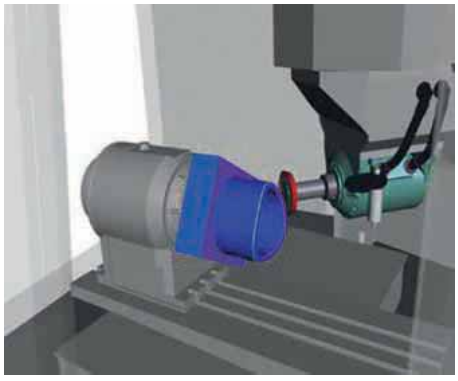
For example, let's examine a cylinder with a corrugated cut, where the corner bevel needs to be ground. Without 3D capability, this is no simple endeavour, especially if the cut features asymmetry. No more than three steps are needed to get this done. After importing the STEP model, select the surface or edge to be processed, which in this case is the outside bevel. You can then select whether the bevel is processed completely or only a segment of it should be processed. As required, the surface may be extended further, either in the direction of the surface normal or at an angle to it. This is also possible without any problems, no matter whether the original model delivers this information or not. Next, just select the matching grinding wheel for this, and the program is finished.



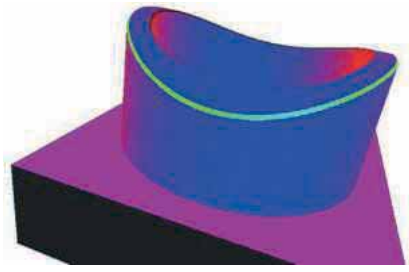
Extended edge projection

* STEP is a general data exchange format for CAD/CAM according to DIN/ISO 10303 and used worldwide. The extended STEP interface is already available and used by numerous customers.

The STEP interface already offers several automated grinding processes like cylindrical grinding, cone grinding and edge extrusion. If the whole thing is connected with Qreator, there's practically no limit to the possibilities. A large part of the STEP grinding programs can also be simulated in the new machine simulation, including the component and grinding wheel. The integrated time calculation also enables the processing duration of the component to be specified very precisely.



Extended machine simulation with 3D model and grinding wheel during corner bevel processing



Selection of the corner bevel

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Production costs reduced by 50 percent

Swiss toolmaker achieves efficiency gains through automation

Fraisa's collaboration with ANCA required a customised solution to run unattended for 50 hours and grind multiple tap types.

Capitalising on the tap market that is predicted to reach $699 million globally by 2020*, automation means the ANCA TapXcell can increase productive grinding hours from an average of 105 to 150 hours per machine per week.

Watch a video here:
https://www.youtube.com/watch?v=XGwroFOuMiI&t=33s

Fraisa is a family-owned business that offers its customers a complete range of solid round tools with endmills, drills and taps. It provides a full customer service offering with logistics, customised tooling, regrinding and recycling of tools. With its headquarters in Switzerland, Fraisa has a strong position in Europe and in the last ten years have entered the United States and Chinese markets.

Josef Maushart, CEO and president of Fraisa says: "We knew that providing taps was a unique selling proposition for us as most of our competitors only manufacture endmills and drills. However, with high labour costs in Switzerland we needed to incorporate automation into the manufacturing process and that took us to the edge of technology as far as cutting tool production is concerned, especially with a complex tool like a tap."

The classic way to grind a tap is to first grind the flute and then on a separate machine, grind the thread. The ANCA TapXcell combines these operations on a single machine which then meant there was opportunity to automate the entire process. Fraisa also wanted the flexibility to change the product without people being involved in the fabrication for small and large lot orders.

ANCA engineering project manager, Amelinda Ilardi facilitated the collaboration with Fraisa: "To remain competitive in high cost labour markets like Switzerland, Fraisa wanted a machine that could grind multiple tap types unmanned for 50 hours. There was no solution on the market and having collaborated with ANCA in the past, Fraisa approached us to develop the technology they needed.

"To enable the machine to run unmanned we needed an in-process measurement capability to ensure grinding stability. To do this, we designed a new application where the thread pitch diameter is measured by a Renishaw MP250 touch probe. Measuring to ±0.002 mm accuracy, this feature is crucial as it ensures every batch of taps are of consistently high quality.

"Not only can the machine run unmanned for 50 hours, it is fully connected being linked to Fraisa's factory ERP system for further efficiency and reliable production data gains. The machine can be remotely monitored using our RedaX product and automatically sends notifications to keep Fraisa's remote staff aware of the machines progress as well as any issues or faults that need to be addressed. In addition, RedaX can be used to track the productivity and up-time of multiple ANCA machines.

"ANCA's commitment to innovation is by being able to deliver custom solutions as an enhancement to our standard product. This requires agile response and capacity in our engineering to deliver what can be quite a complex set of customer requirements." she concludes.

Unique to the market, the TapXcell is a complete production package for tap manufacturers. The grinder itself includes a 37 kW grinding spindle that enables grinding of even taps above M32 as well us dual wheel dressers and between centre workholding. Industry leading iTap software makes setting up all machine operations easy, even for the more complex tool geometries. Grinding capability is complemented by the TXcell's robot loader that manages auto changing of up to 24-wheel packs and tool changing. For Fraisa, ANCA introduced an extended capacity turn table to the current TapXcell design to meet the additional capacity requirements.

Josef Maushart continues: "ANCA has the capability and will to answer our specific requirements and collaborate with our teams to customise a solution fairly quickly. From previous projects I knew they had an experienced engineering team with the capabilities and capacity to take on complex challenges such as automating tap grinding.

"With the change from the manned three shift operation for five days a week to the unmanned seven days operation we cut costs by half. This meant we increased the productive hours from 105 on average, to 150 per machine per week which will deliver serious efficiency benefits."

ANCA (UK) Ltd
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Engis ElectroMill for high precision, high volume face milling

Engis ElectroMill™ diamond and CBN electroplated grinding solutions are designed to replace expensive, complex, tungsten carbide or PCD milling cutters in the production of high quality, flat milled surfaces for high precision, high volume applications, even those with an interrupted cut or where multiple materials must be machined simultaneously.

Designed for use on a wide variety of machining centres, for example VMC, HMC, 5-axis mills, in fact any system with high pressure coolant and 10K+ rpm, ElectroMill improves surface finish and flatness, dramatically extends tool life and reduces cost per part.

ElectroMill solutions are offered either as an integral unit, providing increased rigidity and internal balance, or as a multi-part shell design, offering more flexible options and adaptability for legacy tool holding situations. A number of standard taper options are also available.

Major benefits of Engis ElectroMill include: reduced numbers of operations, setups and inspections, high stock removal

rates and low heat build-up, providing stress-free, cool cutting action. ElectroMill extends tool life compared to conventional milling cutters because the diamond starts and stays sharp with constant controlled micro-fracturing and no dressing cycles are required. In addition, the ElectroMill solution is environmentally friendly, being usable with water-soluble or synthetic coolants.

Significant advances in part quality, as well as cost savings, can be obtained using ElectroMill in sectors, including marine, automotive, aerospace and defence, across a wide variety of components in ferrous, non-ferrous and exotic materials.

Headquartered in Wheeling, Illinois, Engis Corporation is a worldwide organisation manufacturing and marketing superabrasive finishing systems and high-precision micron diamond and CBN powders for operations that demand precision surface polishing and close-tolerance requirements.

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Leading manufacturer of solid carbide tools uses QUICKPOINT from JUNKER

The MAPAL Centre of Competence for solid carbide tools grinds interfaces for replaceable head milling cutters on a QUICKPOINT 3000-60S. These precision parts connect the solid carbide tool head to the shank. The robust QUICKPOINT ensures efficient, high-quality series production thanks to its high level of automation and capacity utilisation, exactly what MAPAL requires from the machine.

Whenever Thomas Baur is standing in front of one of his QUICKPOINT machines from JUNKER, it is usually running at full speed. "QUICKPOINT has one of the highest production hours that we have ever achieved," says the head of the Cylindrical Grinding department at MAPAL. "QUICKPOINT's capacity utilisation is up to 95 percent," adds managing director Ulrich Krenzer.

The MAPAL Group is a leading international supplier of precision tools for machining almost any materials, with over 5,000 employees around the world.

This large machine with enormous cutting force always delivers very high quality "even when used for unmanned production, overnight and on the weekend," says Ulrich Krenzer. JUNKER only uses high-quality components, which ensure a stable process, in its QUICKPOINT machines.

The MAPAL Centre of Competence for solid carbide tools grinds the interfaces for replaceable head milling cutters on a QUICKPOINT machine from JUNKER

The reliability provided by QUICKPOINT is crucial for the company. The MAPAL Center of Competence for solid carbide tools in Altenstadt, Germany produces high-performance drilling and milling tools for renowned customers in the automotive industry, aviation, mechanical engineering, and the tools trade. These include replaceable head milling cutters which have solid carbide blades and a steel shank piece, which are connected to one another by a coupling.

A visit from the JUNKER Group: Thomas Baur (right), head of the Cylindrical Grinding department at the MAPAL Center of Competence for solid carbide tools in Altenstadt, Germany. MAPAL and JUNKER have been working together successfully for many years. JUNKER's Regional Sales Manager Waldemar Görtz (on the left) looks after the company

Benefits for series production

MAPAL's replaceable head milling cutters are manufactured with such precision that they can be exchanged without the need for tool offsets in the machine. "The tool head is unscrewed and the new blade is fitted. You basically press the start button again and production continues," explains Thomas Baur. "This is especially important for series production." Conventional shank tools can normally only be exchanged in the tool presetting room, where the lengths must be precisely set on the measuring machine.

Replaceable head milling cutters represent the more favorable alternative for machining tasks. "The bigger the tool, the greater the benefit," declares Ulrich Krenzer. "When it comes to quality and accuracy, our replaceable head milling cutters perform as well as their solid carbide equivalents."

Accuracy results in high parts quality

To do this, the interface must be ground with maximum precision, "otherwise it just doesn't work," explains Thomas Baur. One of the challenges, he says, is that if the coolant temperature changes by just one degree Celsius, then the tool will not be produced with micron accuracy.

The measurement system used on the QUICKPOINT 3000-60S detects these types of fluctuations and automatically corrects

them, as well as the wear level of the grinding wheel, for example. It is this level of accuracy which results in consistently high quality.

The replaceable head milling cutter system is also beneficial for customers who work with a high degree of automation. "Instead of having to keep three or four complete tools to hand, only the replacement heads are needed," says Ulrich Krenzer. This is because the shanks can be reused and combined with different heads. "This reduces warehousing costs and ties up less capital in the form of tools."

Efficient thanks to high level of automation

QUICKPOINT can be used to grind almost all workpiece contours, materials and material combinations with just one grinding wheel in a single clamping setup. At the MAPAL Center of Competence, they are used for grinding operations such as diameters, shoulders, tapers and surfaces. MAPAL grinds its blanks on the QUICKPOINT 3000-60S. As well as the interfaces, these are mainly products with a large diameter range of 12 to 32 mm. QUICKPOINT is particularly efficient at this task and guarantees reliable, high-quality series production thanks to the high level of automation. MAPAL know that they can rely on this machine.

Excellent service experiences

Thomas Baur finishes by raising another advantage of QUICKPOINT: "We have had a really good experience with JUNKER." He is not just referring to the hardware. "The service is the best. They are there for you should you need it," in his expert opinion.

The JUNKER Group, based in Nordrach in Germany, is the world's market leader in the manufacture of CBN high-speed grinding machines. Just under 1,500 employees the world over are working to secure the company's technological leading edge. All renowned car manufacturers and their suppliers as well as tool manufacturers and other sectors of industry place their trust in JUNKER's innovative grinding concepts. Whether for mass or small series production, JUNKER grinding machines operate to a high standard of precision, economy and reliability.

Alongside Erwin JUNKER Maschinenfabrik, the JUNKER Group also includes ventilation specialists LTA Lufttechnik GmbH and the company Zema Zselics Ltda. LTA Lufttechnik GmbH manufactures air filtration and fire protection systems for commerce and industry. ZEMA reinforces the group as a specialist in grinding with corundum.

JUNKER replaceable head milling cutter 2

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Laser machining company chooses Alicona to measure edge quality and surface finish

Laser machining creates cutting edges with smallest radii while eliminating chipping and tool wear. Laser machining systems of LASERPLUSS have been used in the serial production of diamond and carbide cutting tools for many years. With quality assurance and documentation by Alicona, this supplier invested in a benchmark from the industry, because Alicona 3D measurements are considered the decisive reference in the market.

It takes quite a bit to produce super sharp cutting edges with extremely tight tolerances. One way of manufacturing such complex geometries is using laser machining systems. Precise material removal using a laser is becoming increasingly popular with tool manufacturers as it offers machining possibilities that "conventional methods such as grinding or eroding can no longer cover." This is how LASERPLUSS, a German supplier of laser machining systems, describes a current machining trend in industrial manufacturing.

The company is one of the most innovative in the sector of laser machining. Diamond and carbide cutting tool manufacturers value the company's laser machining systems for producing cutting edges of the highest precision and smallest radii without any chipping. Since measuring cutting edges with radii this small is an at least equally hard task, LASERPLUSS uses Alicona devices for edge inspection and the continuous improvement of manufacturing technologies.

Wolfgang Prem, sales and operations, LASERPLUSS

"The capability to measure small radii, the intuitive handling, and the many applications in an industrial production environment pushed Alicona systems to the top in our decision-making process," explains executive board member Wolfgang Prem, responsible for sales and operations. "We know Alicona is the standard in metrology and many of our customers use Alicona systems as well. This makes for objective comparisons and serves as a solid foundation for exchanging experiences."

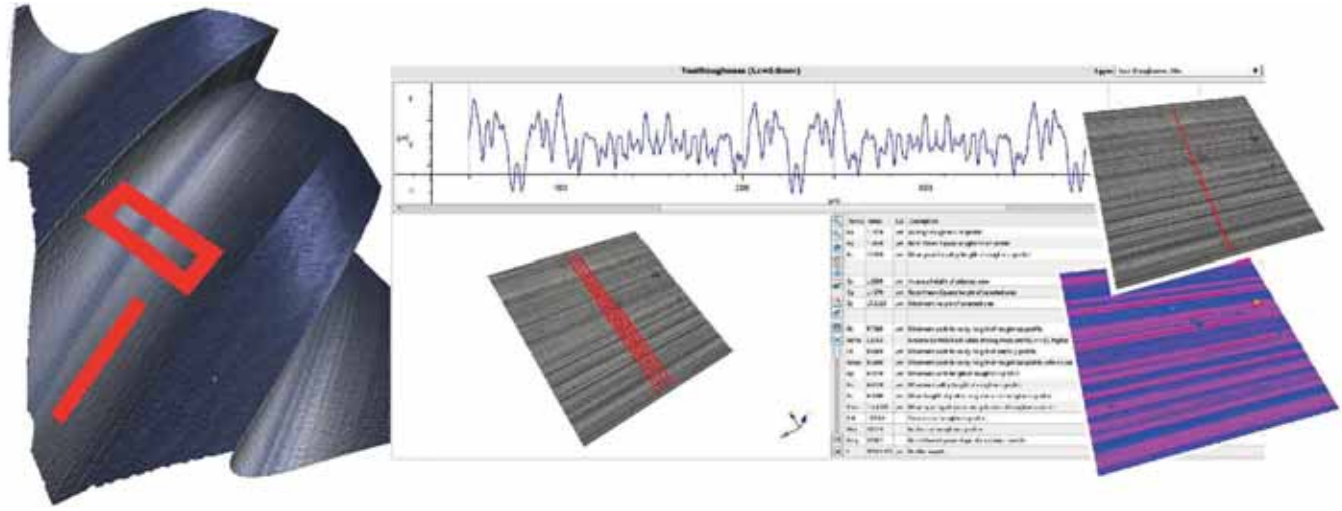
3D measurements to ensure and demonstrate machining precision

Surface machining by applying laser technology is a relatively new surface processing method and competes with conventional mechanical and thermic machining methods like grinding and eroding. 3D measurements and visualisation of edge geometries are great sales tools for LASERPLUSS, since they demonstrate the high quality of laser machining in a simple and illustrative way. They make the advantages of laser ablation over conventional methods plain to see. "In contrast to conventional methods, no cutting force is exerted when producing cutting edges with lasers. This is particularly important for remaining efficient and economical when machining special materials," LASERPLUSS explains. Alicona´s measurement results for tools made of PCD, CVD, and MCD speak for themselves when it comes to demonstrating the advantages and precision of laser-machined cutting edges.

"Better roughness produces better machining results"

In quality assurance and production optimisation, Alicona is mainly used for testing and cross- checking production parameters of cutting lasers from the "Cutter" series in precision machining, used for producing both diamond and carbide cutting tools.

Surface parameters that are verified include edge geometry, edge roundness, contour accuracy, clearance angles, and undercuts. Roughness is another highly important parameter that needs to be measured in quality assurance.



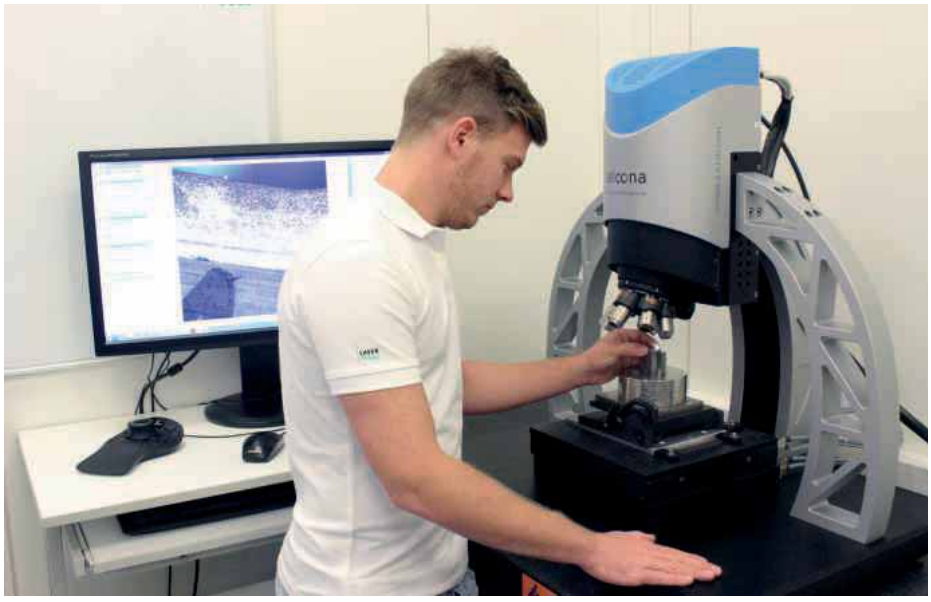
Tool roughness

"Our customers are very demanding in terms of tool roughness, and for good reason. The roughness of the cutting edge significantly influences the machining result," explains Wolfgang Prem. "With Alicona measuring systems, we as a manufacturer demonstrate which Ra, Rq, and Rz values our cutters achieve."

According to LASERPLUSS, the reason why tool manufacturers have started placing more emphasis on roughness is rooted in the advanced possibilities of laser machining.

"In the beginning, achieving good surface roughness results with lasers was challenging. Today, our laser systems have significantly improved and offer a great deal more possibilities. Customers who have been relying on grinding, for example, and who are now looking to extend their machining capabilities need to be convinced that lasers can produce ideal roughness as well. That's exactly what we do with measurements and visualisation by Alicona." Wolfgang Prem concludes.

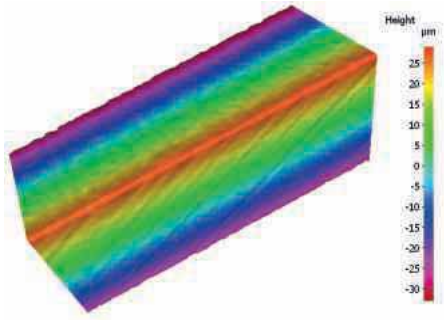
Alicona measurement solutions enable the verification of cutting edge preparation, definition of correct machining parameters such as feed rate and cutting speed, surface finish measurement to determine cutting quality, ideal chip removal throughout areal roughness measurement in the flute, quantification of droplets for improved coating processes proved through areal roughness measurements, detection of edge chipping throughout profile roughness measurement, verification of bevel geometry, full form measurement with Real3D technology, complete reverse engineering and much more.



Alicona InfiniteFocus with user

Alicona is a global supplier of optical 3D surface measurement solutions for quality assurance in the lab and in production. Its key competence is the measurement of form and roughness of even complex, miniaturised geometries. With Focus-Variation the key technology, it offers a technique that combines the functionalities of a micro coordinate measurement machine (CMM) with those of a surface measurement system. For the user, this means to measure both form and roughness of components on an areal basis. The stable and robust technology of Focus-Variation delivers repeatable and traceable measurements even in a production near environment.

Alicona's product range includes a number of standard as well as special solutions. Research and Development acts very close to the direct need of industry, which enables us to design both standard products as well as special solutions based on industrial partnerships.



The Alicona headquarters is situated in Austria. Additional subsidiaries are run in Germany, France, UK, USA, South Korea and Italy, and further expansion is continued. A global network of selected distributors makes Alicona products worldwide available.

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LASERPLUSS RayCutter machine

Customised cleaning solutions for machining

BvL offers a comprehensive portfolio for precision cleaning

Machining and the associated turning work are central steps in the manufacturing processes of a variety of different industries. This machining of metals produces various types of contamination in different work steps. The reliable cleanliness of the workpieces before further machining or after the completion of precision components must be absolutely ensured. This is the only way to avoid production downtimes and quality degradation. BvL Oberflächentechnik GmbH offers a comprehensive range of cleaning systems for a variety of different requirements. Here is a small selection from the many possible systems:

Geyser removes firm burrs with high pressure

The BvL Geyser high-pressure process is ideal for removing swarf and firm burrs. A high-pressure pump generates a water jet which is used for cleaning, deburring and paint stripping, depending on the requirements. The components are cleaned reliably with an adjustable pressure of up to 3,000 bar and a volumetric flow of up to 48 l/min. The GeyserVM high-pressure unit is the core of any high-pressure cleaning unit from BvL. Different nozzle systems allow individual processing. For bores and channels in the component, for example, a lance system is installed with a nozzle that rotates 360° around the longitudinal axis of the lance system. The high kinetic energy breaks the burrs and detaches them from the component.

Focus on clean components

The NiagaraMO basket washing system uses a different cleaning principle. The compact flood/spray system allows thorough all-round cleaning through rotation of the parts baskets or parts carriers around the horizontal axis. The front loading with a roller-guided holding fixture allows direct linking to the existing production process. An additional stationary table with cross-moving in feed and discharge makes even faster throughput times possible, even on components with complex shapes. Optional ultrasound cleaning achieves particularly good cleaning results.

Continuous cleanliness

The YukonDA continuous system is designed for a production process with continuous material flow. The parts pass through the successive treatment zones in an in-line process and can be synchronised if required. The parts to be cleaned are moved past the continuous nozzle frame with offset nozzle positioning. This nozzle system as well as the load capacities and dimensions are individually adapted to the corresponding components. Different wet treatment zones for washing, degreasing, phosphating, rinsing and passivating as well as for drying can be arranged sequentially as required.

At the Turning Days trade fair in Friedrichshafen from 19 to 22 February 2019 in Hall A3, BvL Oberflächentechnik GmbH will provide information on the high level of flexibility of BvL systems and the integration options for high-pressure deburring with the Geyser unit.

Cleaning equipment for reliable technical cleanliness

BvL Oberflächentechnik GmbH is one of the leading manufacturers of industrial cleaning systems. Since 1989, we have been developing and manufacturing individual, integrated water-based cleaning solutions in Germany. From compact to complex, they always impress with their durable quality, intuitive usability and innovative technologies.

A 150-year tradition in mechanical engineering is the basis of the profound expertise as a company in the BvL Group. Your requirements and the Group's own research and development in Germany fuels the drive to always offer the best cleaning solution.

BVL manufactures the high-quality and efficient systems and system components in its own production and assembly in Germany. Well-known manufacturers and suppliers in the field of mechanical engineering, electrical engineering, medical and vehicle technology, rail transport and aerospace rely on tailor-made BvL cleaning systems.

Smart cleaning solutions and constant process monitoring complete BvL's advanced automation concepts. In addition, expert advice and a worldwide sales and service network are always at your side.

The solid foundation is built on three strong pillars:

- Cleaning systems: needs-based plant concepts for high efficiency
- System components: tailored to your requirements
- Service: personal, flexible, competent

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Compact aqueous cleaning machine

Aimed at entry-level users, a compact washing machine has been introduced by Turbex for fast, efficient cleaning of industrial components. Employing aqueous technology for the cleaning process, the inexpensive PURA is a general purpose, single tank spray-wash system whose construction and programming have been simplified to the essentials.

PURA is now the smallest in a range of six machines, half of which also have the capability to flood-wash the components. All models incorporate a patented system whereby the basket holding the parts can be programmed to rotate in the same or opposite direction as the rotating spray nozzles. For some applications, the latter action increases the effectiveness of the washing, especially when processing complex components. They are subsequently dried by a hot air impulse blower.

Despite employing powerful technology, the machine is both functional and simple to operate, the standard wash program being designed so that anyone can use it. The equipment supports uncomplicated handling and a kit including a 471 mm x 321 mm x 200 mm basket and a cleaning agent is supplied, making it easy to get started. An optional oil separator and high-quality filtration ensure long and consistent service life.

Turbex Ltd was established in 1981 and specialises in supplying aqueous systems for component cleaning. The company offers a very wide choice of batch and in-line cleaning machines of the highest quality running to over 100 standard models, backed by expert advice on cleaning agents, component handling and process specifications.

The Alton, Hampshire-based company provides total product support for all component cleaning requirements, based on a long-term partnership approach with customers.

Turbex is the Powerful Force in component cleaning for the aerospace, automotive, rail, medical, optics, electronics, manufacturing and subcontracting industries.

The new, entry-level PURA aqueous cleaning machine from Turbex is a small, single-tank model for spray cleaning industrial components

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Using flammable solvent in harsh climates

Precision ultrasonic cleaning for the Military

A world-renowned manufacturer of military aircraft required cleaning equipment for overhauling components during routine maintenance.

Military aircraft users have specialist requirements in that they need to carry out precision cleaning using flammable solvents together with ultrasonic agitation and heat soaking of various components during scheduled servicing. This servicing needs to take place at various worldwide locations including some extremely harsh climates.

The preferred batch cleaning system needs to be able to utilise a flammable solvent in a controlled manner and cope with the harsh climates. The systems needed to be robust, easily maintainable and have an extended warranty. As they would be operating in countries with hot climates there was a necessity to have the fluid chilled, to maintain the temperature below the flash point, using cooling coils. A safety cut-out was in use continually should the fluid or ambient temperature rise above 40°C.

Having spent some considerable time selecting suitable vendors, the company nominated Layton Technologies as its vendor of choice. The 3-stage in-line system designed and manufactured by Layton was well able to meet all the specialist criteria.

The system included chilled plates and an external chiller unit to ensure that the temperature requirements were always observed. The tanks were heavily insulated to make sure that the temperatures remained at the required level with minimal power consumption. In addition, each tank had in-line particle filtration and ultrasonic agitation to provide excellent and repeatable cleaning of the components. Two of the tanks were heated to 85 deg C and in combination with the flammable fluid tank could remove limescale and carbon from the parts. Fluid level detectors were included in all tanks along with automated fill and drain capabilities.

A machine mounted control panel was used to display and control process times, temperatures and fluid levels and to provide warnings to the operators should any fall outside the pre-set parameters. Each of the systems manufactured was required to be compatible with the electricity supply for the country of installation and this was done with ease by Layton's team of designers and specialist procurement staff.

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Bespoke washing technology – because not every manufacturing process is the same

The continued advancements in manufacturing technology, combined with requirements for ever-higher cleanliness levels in precision engineered components, is resulting in more demand for bespoke aqueous washing systems, according to MecWash Systems.

The UK-based global specialist in the design and manufacture of aqueous parts cleaning and degreasing equipment says that, while its standard range of tailored systems surpassed the specifications required by most manufacturers, bespoke systems address more specialised requirements.

"In the majority of cases our aqueous washing and degreasing systems, combined with the development of specific chemical formulas produced by our in-house laboratory, provide a solution that more than meets a manufacturer's requirement," says John Pattison, managing director of MecWash Systems, based in Tewkesbury, Gloucestershire.

"For some, however, if they're manufacturing a new product, have a unique cleaning challenge or complex production techniques, possibly due to one of its customer's specifications, then a bespoke system might be required.

"Indeed, while all of our systems are commissioned to a customer's specifications and trialled before installation, a bespoke system can be tailored even more specifically to its own unique needs and processes."

With 70 percent of UK companies expecting to increase productivity this year, combined with global demand over the past 12 months for increases of 25 to 50 percent in cleanliness levels within sectors including automotive and aerospace, demand for quality washing systems is expected to rise as companies secure new contracts or increase production.

One of MecWash's existing clients, a leading manufacturer in the aerospace industry, had a specific cleaning requirement for bearing housing engine components. The bearing housings are made of super alloys. The oil and swarf contamination created in the manufacturing process must be completely removed before the components can be used in an engine assembly.

The challenge was to adequately flush out the internal galleries, channels and tubes as the customer's existing immersion equipment was not meeting its stringent cleanliness specifications. The solution was MecWash designing and building its largest machine to date, the 'SuperMaxi', based on existing designs but scaled up to handle the large component size.

The wash, rinse and dry process used in the SuperMaxi features a high flow rate designed for flushing complex components. The components are held in a wash chamber and wash solution is pumped through and around the rotating parts at up to 2,000 litres per minute.

The combination of high flow wash and rinse processes and dedicated jetting of the critical features provides extremely powerful cleaning and highly successful contaminant removal.

A very different challenge arose at Cambridge based C4 Carbides Ltd, which manufactures power tool accessories and industrial band saw blades. It needed to increase its cleaning regime to meet its customers' demands and to ensure 24/7 production, with no costly downtime and without compromising product quality. The company already used a MecWash Duo which was delivering excellent results.

C4 needed to ensure it could achieve an extremely clean surface on a fast moving band of steel, before applying tungsten carbide or diamond coatings to form saw blades.

"Any oil or dirt residue remaining from the production process has the potential to significantly impact the quality of our product, which in turn, could adversely affect our reputation," says Chris Norman, process engineer at C4 Carbides Ltd.

MecWash suggested the company installed two custom made wash systems for the two production lines. Designed and trialled, the exacting results were delivered, and the bespoke washers were commissioned and introduced to the production process.

"These washers provide a continuous cleaning process which is vital for a manufacturer like us where production takes place 24/7and any downtime we incur would lead to higher costs." adds Chris Norman.

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

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Adapt your cleaning processes to future-proof your production

Critical cleaning processes are found in many industries and they all require different degrees of 'clean', but one common characteristic that defines "critical cleaning" is the recognition that if the cleaning is not done properly the product simply will not function reliably.

The landscape for cleaning processes has become more challenging. As a general trend across many industries, components are getting smaller, capabilities are getting greater and tolerances are getting tighter. Consequently, users of modern cleaning systems need to constantly improve their processes while juggling product upgrades, cost reductions and aggressive competition. On top of that are environmental concerns, new regulatory requirements and pressures for a healthy workplace. So, what is the answer to finding a cleaning process that takes into consideration all of the above concerns? Vapour degreasing.

Be ready to adapt

Parts cleaning is essential to many industrial processes. For example, it is critical for successful surface finishing or before processes like electroplating. Finding a cleaning method that works well the first-time, whilst addressing all other concerns is important. Many companies are renewing their interest in the benefits of vapour degreasing over other cleaning procedures because it is a highly-effective way to clean parts. Vapour degreasing is a process that uses sophisticated, "low-boiling" chemistry to remove contamination. Vapour degreasing machines are closed-loop systems and recycling is inherent in the process. Vapour degreasers are effective, small, fast, economical and extremely flexible.

The concept behind vapour degreasing is

simple. The system 'boils' a cleaning liquid into a vapour, contains the vapours inside the system, cools the vapours back into a liquid, and collects this purified liquid for re-use. The low-boiling fluids used within the system have multiple chemical properties that are advantageous to critical cleaning. For example, they usually have a low surface tension and a very low viscosity, therefore they easily penetrate and clean even the tightest of spaces and under the smallest of parts. Most vapour degreasing fluids also are very heavy and dense, typically 20-40 percent heavier than water, which aids in dislodging particulate from the components. Because the cleaning fluid is engineered for specific applications, delicate parts are easily cleaned and dried.

Vapour degreasing systems can be extremely cost-effective because the cleaning fluid is reused indefinitely. In effect, each vapour degreaser is a recycling system. In addition, they also use less energy and have a lower capital investment than aqueous systems.

Option-up

Numerous equipment options make vapour degreasing even simpler and faster. The solvent tanks can be fitted with filtration systems to remove insoluble contamination (particulate). Another option is for the system to be fitted with ultrasonics to enhance cleaning. Automated hoists ensure process control and free technicians from the tedium of lifting parts in and out of the degreaser. "Super heat" and external distillation are other money-saving, performance-enhancing choices. Depending on the application and process requirements, the technology exists to handle the largest parts and highest volumes. These machines, when properly designed, equipped and configured, out-perform the cleaning efficiency of any other cleaning technology, making them the most adaptable option when it comes to guaranteeing precision cleaning processes that will withstand future applications.

Modern cleaning fluids

Companies are developing and commercialising non-toxic, environmentally-acceptable cleaning options that out-perform older fluids. Modern, non-flammable precision cleaning fluids can make a substantial enhancement to the finish of the components. They can ensure that all the surfaces of the product are effectively cleaned ready for the next stage of the process.

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Ajax Tocco, the induction heating expert gets bigger and better

Three of the world's leading experts in the field of induction heating, Ajax Tocco Magnethermic Corporation, Saet-Emmedi and now GH Induction have joined forces, strengthening their position as the world's leading experts in induction heating.

Induction heating is used in many industries for various processes. In very simple terms, it is a non-contact process based on the use of transformers. An induction power supply generates an AC current through a coil/inductor and when a workpiece is placed inside the coil it heats up via its electrical resistivity to the induced current flowing through it. Processes include melting, forging, heat treating, brazing, shrink fitting, curing and welding amongst others. Basically, anything that uses induction technology to heat material, Ajax Tocco can build it and support it.

Ajax Tocco is a US-based company which has been in business since 1916 with a global support network of manufacturing and service centres including Birmingham in the UK. The business manufactures all types of induction heating equipment in sites all around the world. The Birmingham service centre, Ajax Tocco International was opened in 2004: "Here we have the UK's largest induction subcontract heat treatment facility, housing 17 different machines to harden or anneal almost any component our customers send us, from one-off prototypes to continuous batches from automotive first tier suppliers and OEMs," affirms Ajax Tocco's product sales manager, Simon Cockfield.

"The facility also manufactures and repairs inductors and coils that are used for induction heating, anything from a machined crankshaft inductor to a huge coil for melting can be accommodated," he continues. "This is all backed up by a spares

department and a service department, there to provide support to our customers' induction heating equipment for their in-house production."

Although offering a comprehensive subcontract service, Ajax Tocco, as mentioned, is also a capital equipment manufacturer, offering a wide range of induction equipment for melting, mass heating and heat treatment applications.

The acquisition of Saet Emmedi in Italy and GH Induction in Spain has strengthened the Ajax Tocco's group presence in manufacturing induction heat treating equipment, especially in Europe. This is Saet's and GH's speciality, producing highly sophisticated, state of the art machines, mainly for OEMs and first tier manufacturers and particularly for automotive transmission and steering components. Saet and GH machines also offer real time monitoring, with a system that provides remote access to the machines for troubleshooting and offsite monitoring.

Saet is headquartered in Turin, with service centres all over the world, Saet has produced over 4,000 machines since its creation in 1966 with many installed in the UK. Part of the group is Emmedi, a company at the forefront of pipe and tube welding and annealing using induction heating.

GH Induction is headquartered in Valencia and it too has sites around the world, including the USA, India, China, Germany, Brazil and Mexico. The company started manufacturing induction heating equipment back in 1964 and has grown in strength ever since. It has also produced well over 4,000 machines over the years.

"In the heat treatment sector Ajax Tocco, Saet Emmedi and GH Induction machines are used to heat treat a vast range of components from barshafts, camshafts,

crankshafts and stub shafts through to sprockets, steering racks, wheel hubs and roller bearings," points out Simon Cockfield.

"However, we believe that our real selling point is the all-round service we can provide. Leading technology machines from either Ajax Tocco, Saet or GH, a subcontract operation that customers can take advantage of either on a permanent basis or as a backup to in-house production when capacity is short or in the event of a breakdown, plus a comprehensive aftersales service.

"Depending on production volumes, some customers will start by using our subcontract service and then progress onto buying their own machines. Prototypes and trials can therefore be carried out before a machine is actually purchased.

"However, Ajax Tocco's service doesn't stop with the purchase of a machine. A team of skilled service engineers and an extensive range of spares are on hand to get machines back up and running as quickly as possible in the event of a breakdown. Inductor and coil repair are also offered from our expert team of skilled coppersmiths."

Ajax Tocco
www.ajaxtocco.co.uk

Saet
www.saetemmedi.com

GH Induction
www.ghinduction.co.uk

Surface hardening treatment cost

Roger Haw, managing director of Flame Hardeners explains how surface heat treatment is costed

We're often asked how we arrive at our quoted prices, since many heat treatment companies have a £/kg rate, i.e. they charge by the kilo weight being treated.

In general, this kilo rate is suitable for standard treatments such as case hardening, nitriding, hardening and tempering, as a given quantity of energy is used to heat a mass of material to prescribed temperatures and then quench to a prescribed cycle. Handling and jigging, etc. are factored into this rate, although adjustments do sometimes need to be made due to the complexity of some parts.

However, the processes for flame and induction hardening treatments are very similar to machining operations and we have always believed that the most reliable and economic estimates are obtained by using similar costing techniques. Therefore, our prices are always quoted on a per component basis.

The price per component has four elements: machine setting-up charge; treatment charge; tempering charge; inspection charge.

The machine, treatment and inspection charges are all costed at an hourly rate, while the tempering charge is costed by weight, since it is similar to furnace treatment techniques. The reasoning behind this is that setup, treatment and inspection can be estimated in units of time.

The hourly rates, of course, include our overheads, such as the cost of maintaining the appropriate quality assessments, calibration of test equipment, safety inspections, maintenance of forklift trucks and cranes, purchase of non-destructive testing consumables and tools, provision of personal protective clothing to our employees, insurances of many types, business rates, building maintenance, equipment replacement, tooling charges, stationery cost of the many documents involved, e.g. booking in paperwork, production routing sheets, inspection records, advice notes and invoices. As you can see, there are many costs which are not immediately apparent and the list does appear to be endless; however, all of these must be accounted for in overheads to ensure that we remain a viable business in order to continue serving our customers.

The advantage of flame and induction hardening techniques is the efficient use of energy in treating only the specific area of a component that needs to be hard, and sometimes we are asked to harden less than five percent of the total surface area. On the other hand, it may be that the self-same item weighs 20 tonnes and has to be lifted from the floor and mounted in a machine to rotate around its vertical axis. This machine may have to be connected to a bulk liquid oxygen tank and a natural gas supply, which can be compressed before delivery to the machine, or alternatively connection to, for example, a 500 kW induction generator. In hardening this component, therefore, the basic minimum associated equipment will be a 20-tonne crane, a gas compressor, a liquid oxygen storage tank and associated evaporator, or an induction generator and associated cooling equipment. All these elements carry a hidden cost in meeting various regulations (PUER, LOLER, ACOPL8, Health & Safety at Work, etc.), the total of which often exceeds the cost of the energy and labour expended on the part.

This is the reason it is not appropriate for us to quote a £/kg rate.

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Condition-based maintenance using a cloud-based monitoring system

Industrial furnaces in hardening processes usually need to stay functional for up to 30 years. Due to the high stress in the furnace, many system components, such as fan blades or pumps, can wear out and fail unexpectedly, which leads to unplanned downtimes of the systems. To prevent such failures, the American SBS Corporation has developed WatchDogg, a cloud-based monitoring system that supports predictive maintenance. Up to 12 different sensors can be connected to the basic system, which monitor all critical process parameters such as temperature, humidity or pressure. All furnace status data is stored in a cloud and can be conveniently accessed from any smartphone, tablet or PC. This ensures early detection of malfunctions. Plant operators can thus react in good time to maximise the availability of old industrial furnaces.

"Monitoring crucial system components in hardening furnaces is essential to minimise system failures," explains Roland Caminades, managing director of Avion Europa GmbH. "If, for example, the quenching oil is too moist, this can lead to longer cooling times and, if maintenance work is delayed, to fires in the hardening shop.

"Many of our customers are therefore already using our AquaSense sensor to measure the moisture content of their quenching oils. However, there are significantly more parameters that have an influence on furnance availability."

Which is why WatchDogg was designed in such a way that it can manage not only a single sensor, but up to 12 different measuring instruments in parallel. A modular monitoring system of this complexity with an adequate price structure has never previously been available on the market.

Continuous monitoring of mechanical components

If there is no employee in the immediate vicinity of the furnace, local light signals or alarm sounds can be missed. WatchDogg solves this problem because it is a cloud-based monitoring system that collects and processes the central process data and makes it available via an Ethernet or mobile phone connection, available any time and anywhere. It thus supports predictive maintenance and gives an early warning of malfunctions, preventing unplanned plant downtimes.

"The choice of measuring processes and sensors depends on the measured parameter," explains Roland Caminades. "WatchDogg can be connected to completely different sensors to monitor the most important parameters in hardening furnaces, such as pressure, temperature, vibrattion, flow rate or relative humidity."

The sensors do not necessarily need to be installed in the furnace, as they can also measure the critical values indirectly. A vibration sensor can be used to detect when a fan blade is no longer running smoothly in the bearing, as the frequency changes slowly. This also applies, for example, to pumps and other mechanical components.

The sensors are individually set to the desired tolerance range in advance to provide a timely warning of the imminent malfunction.

"As soon as the parameters deviate from the target values, the user receives a message on a computer connected to the cloud and can take immediate countermeasures," explains Roland Caminades. "This makes it possible to plan the maintenance of a specific component at an early stage and hardening shops can significantly reduce the costs for spare parts inventory." For data management, the collected process data is stored in the cloud as milliampere values. The system does not translate the data into a readable message until the signal is transmitted to the defined recipient. This ensures the security of the information at all times.

Easy installation and retrofitting of all industrial furnaces

The cloud-based monitoring system is configured for Europe and bears the CE mark. Thanks to its compact design, it can be mounted on a wall or integrated into an existing control cabinet.

"Old furnaces can be easily fitted with the system by an in-house electrician. They will receive all circuit diagrams from us required to wire up the system and connect the sensors." says Roland Caminades.

In the basic configuration, the WatchDogg initially contains only the signal translator. However, the system can be expanded step by step with additional sensors as required. In the basic version, this is also possible later on with up to 12 data channels. If required, two systems with a total of 24 data channels can also be combined with each other.

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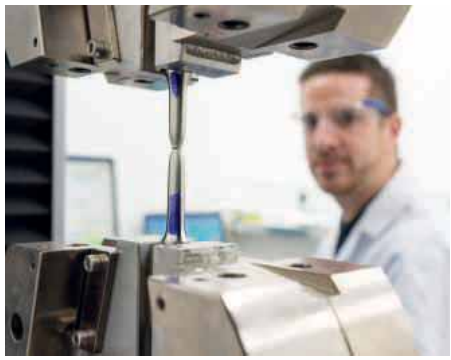
New in-house unit for the mechanical testing of heat treated components

Metal heat treatment specialist, Wallwork Group has opened a new £130K in-house mechanical testing facility, certified by UKAS, at its Cambridge plant.

"Destructive testing is mainly specified by customers in aerospace. However, it is becoming increasingly common in motorsport, medical devices and other industries where there can be no compromise in product integrity. The new facility gives us much quicker results than going out to an external testing lab." explains Andy Fox, operations director at Wallwork Cambridge.

Adding to hardness and shadowgraph is the new Z100 testing rig from ZwickRoell. This gives Wallwork the capability to run tensile, compression and hardness tests on materials and components prior to and post heat treatment. This will help the company quickly identify any material or processing issues that could impact quality. It can also help provide data to refine existing metal heat treatment processes, component design and more.

Confirming that correct heat treatment has been performed on components is



especially important within aerospace, where accurate results contribute to risk-based usage of materials. Wallwork also operates vacuum brazing units at its Manchester and Cambridge sites. These work to many aerospace prime approvals and the new Z100 has the potential to confirm joint strength between vacuum-brazed materials. Metal heat treatment is also performed at two other plants in Birmingham and Newcastle.

"Faster turnaround of testing results is necessary for us to meet customer manufacturing targets and it also makes much easier the internal management of important accreditations. From operating our own commercial pick up/delivery fleet to product testing, we are always seeking ways to improve both the quality and the speed of service to customers. We are now looking at adding inhouse impact and flat tensile testing as part of our continual development process." concludes Andy Fox.

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Audi partners with Tenova LOI for new heat treatment plant

The opening of the Audi-Technikum with the pioneering Tenova LOI Thermprocess heat treatment plant enabled the creation of optimal preconditions to develop lightweight materials and highly economic manufacturing processes for future light metal construction parts. Tenova LOI Thermprocess is both development partner and supplier of the state-of-the-art heat treatment plant.

For many years, a development cooperation in the field of tempering structural cast components has existed between Audi and Tenova LOI Thermprocess. The modular design of the new heat treatment plant was jointly developed according to Audi's specifications. This plant consists of a furnace for solution annealing and aging treatment, a fluidised bed furnace and a quenching device that can be operated with air or water.

"The Tenova LOI heat treatment plant represents an important section in the Audi-Technikum since it is responsible for ensuring the crucial mechanical properties, i.e. stability, ductility of the products", said Erik Micek, CEO of Tenova LOI Thermprocess GmbH. "We are particularly proud of cooperating with Audi to develop highly flexible process designs that allow it to carry out investigations in multiple directions."

The newly developed quenching device represents an innovation with the achievable range of cooling gradients. It is a beneficial precondition for Audi in Neckarsulm to develop in detail new parts of different manufacturing processes and alloys which prove to be suitable for later series production.

"The material development represents the basis for the successful lightweight chassis construction in the Audi works in Neckarsulm. The innovative materials increase the efficiency of our models and are thus essential components towards electromobility," explains Helmut Stettner, plant manager at the Neckarsulm site. Both partners continue elaborating further trend-setting solutions with the aim to optimise the process guidance and the component properties in the production of lightweight construction parts.

The Tenova LOI Thermprocess heat treatment plant with pioneering heat treatment properties and newly developed cooling gradients

Tenova, a Techint Group company, is a worldwide partner for innovative, reliable solutions in metals and mining. Leveraging a workforce of over three thousand, located in 22 countries across five continents, Tenova designs technologies and develops services that help companies reduce costs, save energy, limit environmental impact and improve working conditions.

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In-line blast cleaning

Highly adaptable continuous feed spinner hanger machine for foundry applications

When a Russian manufacturer of mining equipment set up a new foundry, the company chose a continuous feed spinner hanger shot blast machine RHBD22/27-F from Rösler to finish its castings. Besides the heavy-duty foundry design ensuring high cost efficiency and uptimes, the customer was impressed by the operational adaptability of the blast cleaning system. It allows in-line core sand removal and blast cleaning of castings made from different types of metal.

For more than 90 years, the Tomsk Vakhrushev Electromechanical Plant, JSC (TEMZ) has manufactured mining equipment and machinery for other industries. The company's product portfolio includes fans, jackhammers, pneumatic and hydraulic tools, as well as electrical drill presses and saws. It produces the required equipment components as steel, grey iron and aluminum castings at its location in Siberia. A major customer demand for the new TEMZ foundry operation was that the new shot blast machine must be able to cope with the wide variety of different castings. Other requirements were a high cost efficiency and high equipment uptime.

Evgeny Laza, chief technologist at TEMZ, explains: "Very important for us also was that a supplier had at least 15 years' experience in building shot blast equipment, maintains a service organisation with spare parts warehouse in the Russian Federation, has a proven track record with this type of equipment and is an innovator in the field of shot blasting". Moreover, the new blast system had to be integrated into the manufacturing flow in an existing building, which because of the tight space conditions posed a significant challenge to the Rösler engineers.

One reason why Rösler was able to secure this order against numerous competitors was that the RHBD 22/27-F was specially designed for foundry operations with heavy duty wear protection. The blast chamber is completely fabricated from manganese steel, while the "hot spot" area contains a wear lining that consists of replaceable cast and case-hardened wear plates. All other sections inside of the blast chamber are equipped with easily exchangeable manganese steel plates. Rösler also offered the flexibility to adapt the blast machine to the specific space requirements at TEMZ.

Evgeny Laza explains: "When it came to the development of solutions and the handling of all technical details, Rösler reacted a lot faster than the other equipment suppliers. Everything Rösler did was focused on our specific requirements". Another positive factor was that the company had already been operating three shot blast machines from Rösler since 2012.

The continuous blast machine is equipped with an integrated transport system that allows the handling of single work pieces or workpiece batches, weighing up to seven metric tons. Workpiece loading can take place at both ends of the blast machine. After shakeout the castings are transferred to the transport device of the shot blast machine with carriages supplied by the customer. There they are placed in a special lifting device. Once the parts are in place the operator enters the part specific blast program into the PLC and drives the workpiece trolley into the blast chamber.

The blast chamber is equipped with four Gamma 400 G turbines with a drive power of 22 kW each, arranged in-line. During the blast process the castings are continuously rotating. The high-performance turbines, designed and built by Rösler are equipped with throwing blades in a "Y" shape design. Compared to conventional turbines they generate an up to 20% higher blast performance while simultaneously maintaining lower energy consumption. In addition, the throwing blades can be switched around allowing the use of both their sides. A blade exchange takes place with a quick-change system without having to remove the turbine. This results in uptimes, which are at least twice as long compared to conventional turbines.

Automatically adjustable shell valves allow for adaption of the blast media flow, up to a maximum of 290 kg/min (640 lbs./min) to the castings being blasted. The rotational speed of the turbines and the spinner/hanger trolley can also be adjusted to the respective blast cleaning task by frequency inverters. Before travelling to the unload station, the cleaned parts pass through a cleaning station, where residual sand can be removed with a manual compressed air system.

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Components for refuse collection vehicles

Efficient blasting of highly stressed parts

Lifters for emptying waste containers and waste compactors are among the most highly stressed components on refuse collection vehicles. Continuous mechanical handling of bins and containers mean that paint finishes must be highly durable to provide long-term weather protection for these assemblies.

Zoeller Systems spol. sro. was established in 1992 as a subsidiary of Zöller-Kipper GmbH. It built its production plant for lifters and compactors in the Czech town of Říčany, CEO Karl-Heinz Wider says: "This location in the region south-east of Prague was selected due to the favourable transport connection. Another reason was the availability of well-trained skilled labour."

From modest beginnings, Zoeller Systems has developed in the last 25 years to occupy a site with an overall area of 28,000 m², 10,000 m² of which is dedicated to production, while the number of employees has risen to 290.

A new surface treatment line was commissioned early this year. Raw components for compactors and lifters are first welded and machined, followed by surface treatment and subsequent completion of all production processes and test routines.

"We opted for pre-treatment of parts using the new blasting technology because customers expect a superior surface quality, even on highly stressed parts," says Josef Burian, head of the Paint Shop. Initial experience has now been gained with the system.

When asked for the reason to choose AGTOS as a blasting system supplier, Burian emphasises the persuasive AGTOS concept and system flexibility. This ensures the achievement of consistent quality for both small and large parts.

A variety of investigations were conducted prior to the acquisition of the new line in order to determine the best pre-treatment and coating. This involved salt spray testing of surfaces coated through the new system. In addition, the appearance of the lifters under practical conditions was compared to results achieved on workpieces coated using the old method. This also convinced the management of the effectiveness of the new technology.

Machined areas of the workpieces are covered prior to the blasting process to protect them. The precision of these components is crucial if the final product is to function perfectly. The parts are suspended and conveyed to the AGTOS hanger-type shot blast machine and are then fed in manually. The automatic feed unit takes charge of the holder in front of the blasting chamber and advances the workpieces individually into the chamber. They are blasted there for 3 to 10 minutes, depending on the blasting program selected. Workpieces exit the blasting chamber optimally prepared for subsequent wet painting.

The new type HT 10-20-3.6-08-07.5 shot blast machine has eight frequency-controlled AGTOS high-performance turbines, each delivering 7.5 kW of drive power. This ensures that the abrasive reaches every surface, even where complicated geometries are involved. Easily replaceable wearing plates made of tool steel protect the manganese housing of the high-performance turbines. Manganese steel wearing plates also provide optimum protection for the blasting chamber itself against the effects of the abrasive.

The abrasive completes a cycle. It is collected following the blasting process, cleaned and metered back into the process again. Dust created during the blasting process is fed through negative pressure to a cartridge filter unit, where it is extracted from the air. It is disposed of in a big bag. An automatic abrasive refill hopper ensures a uniform process.

A maintenance platform facilitates maintenance and adjustment work. It is reached using a safety ladder with handrails and foot protection.

The shot blast machine can accommodate and process workpieces with dimensions of up to 1 x 2 m (width x height). A double bucket elevator reduces the installation height, ensuring it fitted in the production hall. The customer attached particular importance to a dust-free process which is

AGTOS HT 10-20-3.6-08-07.5 hanger-type shot blast machine with a blasted workpiece

ensured by means of the effective AGTOS cartridge filter unit. It is designed to facilitate the return of cleaned air to the hall. This contributes to energy efficiency and also reduces heating costs.

If necessary, a manual blow-off station allows the operator to remove any abrasive that is still in cavities. Falling abrasive is collected in an 8 m long hopper and fed back into the blasting process. Manual tasks are reduced to a minimum as a result. Thus, the new process differs strikingly from the previous version. Before, large components were first subjected to complete manual blasting in a blasting chamber, while small parts were not blasted at all.

A remote maintenance module enables external access to the blast machine's electronic components. It therefore aids and simplifies troubleshooting.

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Automated blast system removes heat treatment salts from HSS end mills

A leading overseas manufacturer of high-quality tooling has recently installed an automated Guyson Multiblast® RXS400 blast system for the dual purposes of removing of oxidation and heat treatment salts from HSS round end mills and to provide an attractive cosmetic surface finish prior to applying anti-rusting oil. Along with the surface preparation of tooling, typically these highly compact automated blast systems are often specified, by customers, for grit blasting turbine blades and medical implants.

Blast trials were initially undertaken at Guyson's Component Finishing Centre in Skipton, to prove the process, establish process timings and optimise the most suitable blast media. The compact and automated Guyson RXS400 (Rotating indeXing Spindle) system was selected as the most appropriate machine to suit the customers budget and production output targets. The process now achieves a consistent white metal finish in the required time, with virtually no operator involvement apart from load and unloading, thus removing the vagaries of manual blasting and leaving the operator to perform other duties if required.

Guyson Multiblast RXS400 Automated Blast Cabinet with Cyclone and Dust Collector

The Guyson Multiblast RXS400 machine is a twin spindle rotating indexing blast system which provides two driven work spindles at opposite ends of a rotary arm. This arrangement allows one of the spindles to be outside the blast chamber during the blasting operation for simultaneous loading or unloading of the component, whilst the other is inside the blast cabinet being active.

Surface blasting of the HSS drill components is achieved with three powerful Guyson model 900 blast guns mounted on a vertically traversing arm, stroking up and down the various drill lengths, and then a post blast compressed air wash is directed at the drills to remove residual dust and blast media.

The external area around the loading zone is enclosed with an aluminium frame fitted with clear Perspex panels and a vertically sliding pneumatic safety door fitted to the middle of the front panel. This vestibule helps minimise any sound escaping from the blast zone. Hinged pneumatic entry and exit doors allow the component in and out of the blast zone. On the right-hand side of the cabinet is a full width side opening door to facilitate easy access for maintenance and setting up purposes. For safety reasons this door is interlocked to prevent blasting when open.

After grit blasting, the used blast media is extracted via a Guyson CY600/12 cyclone reclamator that separates out the reusable blast media from dust, blast debris and undersized media. The extraction system is completed with a Guysonmodel C800 twin cartridge dust collector fitted with a secondary HEPA 14 filter. The entire blast system is controlled via a Mitsubishi PLC/ 'Graphic Operator Terminal' (GOT), with full colour display screen, which facilitates repeatable blast settings to be simply stored and retrieved in quick access menu systems.

Prospective user of Guyson blast or wash systems are encouraged to submit sample components for free feasibility testing to the company's extensive 'Component Finishing Centre' at Skipton, North Yorkshire.

Guyson International Ltd is a privately-owned family company with a worldwide reputation for excellence in the design and manufacture of blast finishing, spray wash and ultrasonic cleaning equipment. Formed eighty years ago, the company is registered to BS EN ISO 9001: 2015 and BS OHSAS 18001:2007 and its head office is located at Skipton, North Yorkshire. Guyson has four international subsidiary companies: Guyson Corporation of the USA, located in Saratoga Springs, New York State; Guyson SA, situated near Paris, France; Guyson Sdn Bhd in Penang, Malaysia and Guyson CN, in Wuxi, Jiangsu Province, China.

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Hodge Clemco blast rooms for any application

Leading the way in surface preparation since 1959, Hodge Clemco has consistently been the leader in the manufacture and supply of abrasive blasting and surface treatment equipment. The product portfolio ranges from portable abrasive blast cleaning equipment, hand blast cabinets, blast rooms, a full range of expendable and recyclable abrasives, abrasive recovery, and dust extraction & collection equipment.

The range of blast rooms ensure Hodge Clemco can meet any requirement, offering steel panel rooms, low noise rooms and weatherproof containerised rooms. Panelled rooms are designed to be modular and offer the flexibility of being available in a range of sizes. The booths are designed for internal location and manufactured from heavy gauge steel plates with external structural frame. The smooth internal surfaces allow for easy cleaning and efficient grit recovery, while the internal faces of the room are lined with hard wearing shot blast quality rubber for durability.

Where noise reduction is paramount, look no further than an acoustic low noise room. Hodge Clemco's engineers will fully assess site conditions to optimise the noise reduction and thermal insulation properties and again with a modular design it means the room can be installed in almost any size and configuration.

If factory space is at a premium or a temporary site is to be utilised the containerised weatherproof blast room provides an instant and economical solution. They can be based upon standard freight containers which reduce the design and fabrication costs that are normally associated with blast room manufacture.

Hodge Clemco's blast room range also offers many media recovery options, including the 200p media cleaning recovery, scraper floors and screw systems. Dust extraction is also integral to any blasting system, their team will consider the main factors when determining the correct dust collector for a system, such as air speed, air flow and filtration area.

Hodge Clemco's skilled engineered products team can turn any concept into a final design. They have an extensive portfolio of equipment, but the main advantage is their ability to tailor a solution to the exact needs of the customer's application. This is all backed up by in-house technical sales advisors, latest 3D design software and modern manufacturing facilities. A dedicated installation team will ensure the system is installed accurately and efficiently. Regular maintenance and service visits by engineers following install will ensure the equipment is kept running smoothly and economically.

Hodge Clemco has also announced a new partnership with the Institute of Mechanical Engineers training program, offering industry-leading training courses covering all aspects of surface finishing including blast cleaning, painting and inspection techniques.

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Innovation in shotblasting and shot peening technology

Straaltechniek International offers the most advanced solutions in the high-end metal processing industry and supply customisation for each specific problem. A global network of sales and service points provides support in the execution of an extremely diverse range of projects.

The company provides metal processing companies within different sectors with the most innovative solutions. This is achieved with a strong focus on R&D and with an extremely flexible organisation. Straaltchniek's extremely skilled engineers fully immerse themselves in each specific problem, while at the same time setting the highest standards. Where possible, it incorporates insights gained in previously delivered installations in a new concept.

Straaltechniek designs, develops and builds complete installations for shot peening and high-end blasting applications. These are delivered on a turn-key basis and are fully adapted to the client's individual requirements. Where possible, manual interventions are kept to a minimum by employing a high degree of robotisation.

Besides customised solutions, Straaltechniek International delivers a wide range of standard blasting equipment with accessories. It can also supply compressed air and paint spraying equipment. It is also the exclusive supplier for metalising equipment from British company Metallisation.

With more than 30 years' experience, the company has accumulated plenty of expertise in the field of dry-ice and wet blasting, shot peening and blasting agents.

Shot peening and high-end blasting in the aerospace industry

Aeroplane components are subject to constantly changing loads, so that the dangers of metal fatigue are always lurking around the corner. Shot peening is the proven solution for this. Straaltechniek International has been applying this technique successfully for years on, for example, undercarriages, turbine blades, discs and shafts.

Straaltechniek International designs, develops and builds complete shot peening and high-end blasting installations for the aerospace industry and supplies these on a turnkey basis. The solutions are fully adapted to the wishes and requirements of the customer while processes with a repetitive character are automated as far as possible.

An innovator in shot peening, it has vast knowledge of the extremely critical process specifications which have been drawn up by the engine and aeroplane OEMs. It is therefore not without reason that innovations in shot peening have enabled them to take a crucial step in their manufacturing processes.

The installations of Straaltechniek International are eminently suitable for compliance with standards such as: NADCAP, AS9100, FAA and EASA.

Landing gear manufacturer

Straaltechniek offers a total solution to truly meet all client requirements, whatever they may be. For a client in China, for example, it developed an innovative, robotic shot peening machine with one of the highest uptime percentages in the world.

This client, a subsidiary of aviation giant AVIC, produces parts for fighter aircraft. The company was founded in 1958 to develop aircraft for the Chinese Air Force.

Shot peening is used to improve the lifespan of landing gear. To remain competitive, the company needed an improved process with minimum downtime and one which combined steel shot and ceramic beads in a single machine. Collaborative effort by Straaltechniek International and the client's project team resulted in a fully-automatic shot peening machine that met the following minimum requirements: use of both steel shot and ceramic beads in a single process; fully-automatic recycling and classification of peening media; high uptime percentage.

The company made a conscious decision to appoint Straaltechniek International to develop this machine. Due to flexibility in the design phase and ability to collaborate perfectly with the client, it was possible to offer a total solution in which every client requirement was truly met.

An important process for guaranteeing a long lifespan is the application of a plasma coating to protect the surface of the metal. Prior to this coating process, oxides, etc. need to be removed from the surface and the surface has to be roughened; for this step in the process Straaltechniek International developed a high-end grit blasting machine with a fully-controlled blasting process. This means that quality is guaranteed and process variation is virtually zero.

OEM engine manufacturer

Over the decades, Straaltechniek has acquired a great deal of know-how in relation to highly-critical process specifications that are set by engine and aircraft OEMs, and its innovations in shot peening represent a vital step in their production processes.

A leading British manufacturer of aircraft engines was looking for a partner that did more than just build machines. Working in close collaboration with the company's project team, Straaltechniek International developed a complete system that is more than the sum of the individual parts.

The fundamental principle was a process that did not involve manual interventions. The robotic shot peening installation that was supplied met all the client's requirements, amongst other things through process innovation, blasting media classification and process control. Highlights included: maximum productivity by using two fully-automated robots; use of two-diameter steel shot; fully-automated changeover for 10 different nozzles; fully-automated classification of peening media, resulting in best quality continuity without variation; continuous process control and process corrections during the shot peening process. This is possible by using a 'closed-loop' system, which also provides monitoring and data logging.

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The blast cleaning specialist

Vixen Surface Treatments Ltd is a global specialist in the design and production of surface treatment machinery. Vixen exports 40 percent of all machinery overseas and has a strong and respected customer base, including major companies such as Jaguar Land Rover, British Aerospace, Caterpillar, Siemens, Red Bull F1, Black & Decker, Rolls Royce, Hotpoint and Sharp Electronics. The core range of products include wetblasting machines, dry blasting cleaning cabinets and degreasing and phosphating equipment.

Vixen's most popular range is the Aquablast range of machines, which achieve outstanding finishing results on a variety of components. The Aquablast machines come with many standard features, including a fully stainless-steel construction, powder coated finish, large viewing window, a lightweight polyurethane blast gun and a heavy-duty polyurethane abrasive pump.

Vixen's design team is capable of producing bespoke machinery perfectly tailored to the customers' requirements. For example, a bespoke Aquablast machine was created in order to process manufactured medical implants. The bespoke Aquablast 915 which was designed and manufactured at Vixen came with many special qualities. This special machine had two blast guns in order to fully blast the implants, which rotated on a spigot whilst inside the blast chamber. This gave each part a uniformed finish which was very important to the customer.

Vixen takes pride in offering first class worldwide customer service, with a team of engineers that commissions new machinery globally and that 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.

The aftersales team work alongside the service engineers who perform regular maintenance, inspection and repairs of the surface treatment machinery and equipment. Dependant on the customers' preference, care plans can be offered in bronze, silver and gold which include monthly or quarterly services, including break down cover which is also available.

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Famous aircraft coming back to life with the help of Indestructible Paint

The enthusiasm and expertise shown by Indestructible Paint Ltd towards the renovation of classic and historical aircraft is now being further demonstrated with a remarkable World War II restoration project. The Birmingham-based performance paint and coating specialist has responded to a request by Heritage Air Services, a dedicated team currently bringing a Dakota C-47 back to its former glory with the aim of the aircraft's involvement in the 75th D-Day Landing commemorations in the summer of 2019.

"This is a highly impressive project and one for which we were delighted to offer our products and expertise," comments Brian Norton, Indestructible Paint's managing director. "The twin objectives of protection and appearance to match the plane's original livery are central to our involvement, which demonstrate both our product capability and the skills of our laboratory team."

The aircraft itself was located in America and brought back to the UK in sections for the restoration work to be undertaken. Based at Coventry Airport, the project, under the management of Ben Cox at Heritage Air Services, is set to address significant airframe corrosion issues alongside extensive mechanical repairs before its involvement in the events in 2019.

"Our team identified two areas where we are able to contribute: the performance and aesthetic objectives," continues Brian Norton. "We therefore provided our IP9064 epoxy strontium chromate primer which is resistant to all normal aircraft operating fluids. The whole of the aircraft will be coated with the product which will also be colour-matched in our laboratory to match a panel taken from the original aircraft.

"Additionally, our IP6 range of low VOC air-drying, pigmented polyurethane finishing coating will provide flexibility and chemical resistance for light alloy sections. Significantly, we are supplying this product in six different colours so that the aircraft can be restored with all of its original markings including its unique 'Night Fright' logo towards the front of the aircraft."

The restoration team points out that the specific aircraft, of a type that would take on a civilian role after the war as a DC–3, has its own specific proud history. The Night Fright name itself helped to define its role during the war where it made a key contribution as part of Troop Carrier Command operating from Membury Airfield in Berkshire. Ultimately, it will become part of a planned museum on the same site which will be open to the public.

"This is the latest in a series of aircraft restoration projects with which we have been involved in recent years," continues Brian Norton. "Today, the global aerospace industry is a key market for our expertise and products, many of which have been developed to meet specific performance needs in the sector, so we believe it reflects our involvement in the industry, both past and future. The team that is hard at work at Coventry Airport deserves enormous credit for its efforts and we look forward to the aircraft's deserved participation in next year's D-Day commemoration events," he concludes.

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ATEX certified drum pump ideal for transferring flammables

Motor-driven drum emptying pumps are recognised as a safe, clean and efficient method of transferring liquids from small drums, buckets and IBC's and Finish Thompson EF Series of drum pumps are acknowledged as one of the most competitively priced and high-quality motor driven pumps in their class. A new ATEX option has now been added to the range for use with flammables, or in hazardous areas.

Available through pumping specialist Michael Smith Engineers, the EF Series ATEX sealless drum pump is certified for safe container-to-container transfer of flammable or combustible liquids such as acetone, alcohol, diesel fuel, gasoline, kerosene, tolulene, xylene and mineral spirits.

The addition of this new ATEX option further extends the EF drum pump range providing users with the ideal method of transferring not only flammable liquids, but also oils, detergents and other similar liquids at flow rates up to 64 litre/min, at discharge pressures up to 6.1 m. Thanks to three material options of stainless steel, PVDF or polypropylene and five different tube lengths of 40 cm, 70 cm, 100 cm, 120 cm and 135 cm, there is a pump to suit most drum emptying applications.

There is also a wide choice of motor options which are all interchangeable with any tube selection. These include two speed 110 V and 230 V single phase splash-proof motors, a 12 V Lithium Ion cordless rechargeable option and now the new ATEX certified air motor.

Compared to hand-operated pumps FTI drum pumps enable

precise amounts of liquid to be transferred to smaller containers with less risk of spillage and also help to eliminate the handling problems associated with heavy containers.

More details can be found at: **https://www.michael-smith-engineers.co.uk/products/finish-thompson/drum-pumps-and-barrel-pumps/ef-series**

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