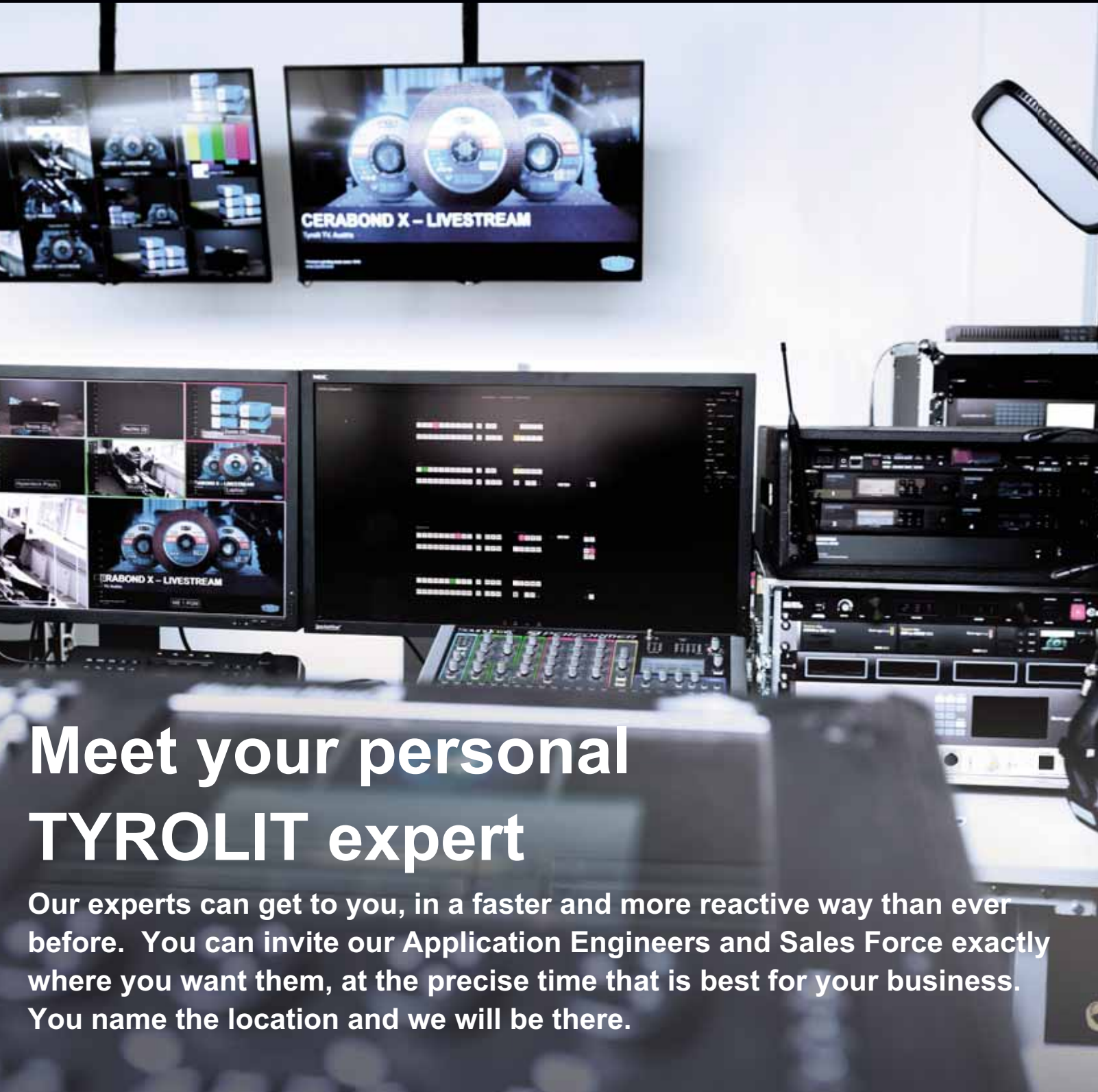


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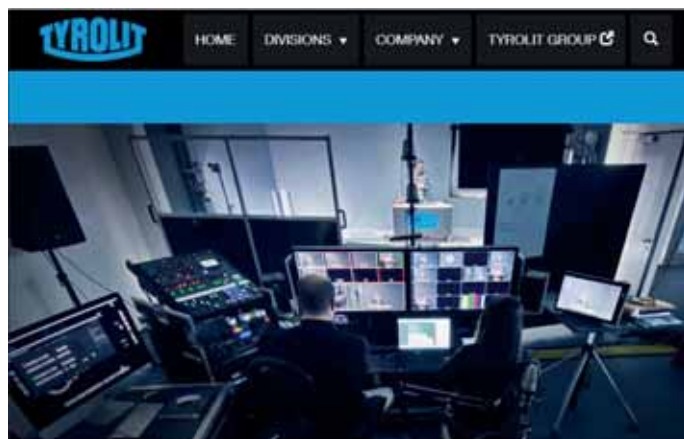
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NEXT ISSUE - APRIL 2021

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- Blast Cleaning
- Component Cleaning
- Polishing & Lapping
- Tool & Profile Grinding

Meet your personal TYROLIT expert

The world faces challenging times and the TYROLIT experts can't get out to you like they used to. But actually they can, in a faster and more reactive way than ever before. You can invite our application engineers and sales force exactly where you want them, at the precise time that is best for your business. Whether your office, your workshop, you name the location and they will be there.



Introducing TYROLIT TV

TYROLIT has spent hundreds of hours working intensively to create its very own television studio. Now it is ready and TYROLIT is looking forward sharing this with you. This is new territory and one that the company is very keen to explore with you. It wants to know what works, what doesn't and what you can do to get the most out of this brand new, state of the art facility.

TYROLIT will be holding regular product presentations and live interactive training sessions in the studio. These sessions will also be available to download for your ongoing use. TYROLIT is very aware of changing times; the way it goes about its business is changing and it is adapting to that change in a really good way.

At the launch event, a TYROLIT application engineer demonstrated the industry leading range of grinding discs and showcased the brand new range of Cerabond X fibre discs. You can tailor training sessions or create a bespoke appointment with one of the experts. In short, it's like having application engineer on speed dial in your pocket, but you get them visually in real time, understanding the problem and creating the solution.

TYROLIT is one of the world's leading manufacturers of grinding and dressing tools, as well as a system provider for the construction industry. Headquartered in Schwaz, Austria, the family-owned business combines the strengths of being a part of the dynamic Swarovski Group with over a century's worth of individual corporate and technological experience.

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Spot the difference

They say that a year is a long time in politics but, in 40 years in trade and technical publishing, the changes are far more apparent

By Roger Barber

After a few years in telesales and in the field with Industrial Exchange & Mart, I joined Production Equipment Digest in 1984 as a sales executive.

1984 was momentous in other ways: Margaret Thatcher was Prime Minister and Ronald Reagan won a second term as US president. It was also the year of the Miners' Strike, Band Aid and the murder of Indira Gandhi.

Against this backdrop, Britain was actually doing rather well and the machine tool and engineering sectors were booming. Trade & technical magazines were sailing along nicely and life in advertising sales couldn't have been better. Business lunches and client entertainment were paramount in generating advertising and if you worked hard the rewards were amazing.

It was therefore something of a shock when, after purchasing the AGB Pergamon Group of which PED was a part and then merged with Maxwell Business Communications, Robert Maxwell died on his luxury yacht in 1991. I was then advertisement director of PED at the time and recall the moment when we received the call announcing his demise. Within a couple of years, the empire collapsed, PED was folded and we were all made redundant.

In the ten years or so after this, I worked freelance and launched Essentials for

Industry with Barry Smith of Colby Publications. This was the era when colour separations were king, even though the advances in the printing process rendered them unnecessary. Interestingly, there are still publishers charging for these today!

In 2003, I identified a need in the market for a production grinding and surface finishing magazine and launched Grinding & Surface Finishing. Now in its 18th year, it has established a position as the leading magazine in its field, supported by a raft of leading machine tool companies and major players in the production grinding, blast cleaning, honing, deburring and component cleaning sectors.

A year later, armed with research carried out in the engineering market, I decided to launch a magazine mailed exclusively to subcontractors in the UK and Ireland. Comprising companies with 10 employees or less that made 80 percent of purchases of machine tools and ancillary equipment, Engineering Subcontractor is unique as it specifically targets these readers rather than relying on a "catch all" approach.

Over the past few years, along with other publishers, we have been propelled into the world of hits, traffic and webinars that now dominate our world. However, even a leading online platform provider has shown the continuing importance of printed magazines by launching its own magazine.

Feedback from our readers shows that they still want magazines to read that are informative and well designed to guide them to what they should be looking at online. They tell us they simply don't have time to trawl the internet aimlessly to find what they don't even know they need. Despite the challenges that it had brought, it has provided a wake-up call to publishers to reassess our priorities for the readers.

So what makes our magazines different? Firstly, they are easy to read with clearly defined features and sections. Overall, we also publish more editorial than other magazines in the market. Less advertising of course makes it harder, but we still want to maintain issue sizes to maintain the editorial content. We also edit press releases to fit



our own editorial style. Contact details, i.e. company name, telephone number, email and web address are included for readers to follow up their interest.

Finally, I would like to thank all the companies that have supported us over the years and continue to do so. I am confident that we will meet the challenges full on and enable our advertisers and readers to be successful.



THE ART OF GRINDING.

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Custom grinding solutions for flexible aircraft maintenance

by Claudio Tacchella

Among the numerous factors that guarantee the safety of flights, whether civil or military, there is one that is particularly important and it is called maintenance. In general, maintenance consists of all the operations of lubrication, repair, overhaul, reconstruction, replacement, adjustment and tests carried out on the aircraft with the aim of keeping it in a state of airworthiness. The aircraft manufacturer in fact ensures that checks, verifications and procedures are carried out for each individual piece designed for its life cycle Maintenance Planning Document (MDP). For this purpose, the Maintenance, Repair and Overhaul (MRO) industries play a primary role, carrying out all maintenance activities on the parts subject to inspection and testing. We are talking about highly specialised companies and technicians certified according to the Part 145 rules of the European Aviation Safety Agency (EASA) regulation. To give an idea of how strategic this sector is, just think that in the world there are only 2,072 certified aeronautical maintenance companies of which 94 percent are in Europe, with the UK in first place followed by France, Germany



The AKP range for landing gear grinding machines with gap bed

and Italy. In this context, the MRO industries perform maintenance on hundreds of different aircraft models and, consequently, process several thousand components, including mechanical ones.

Aircraft landing gear, turbine engines, mechanical transmissions, bearings,

recirculating screws and tie rods are just some of the parts subject to overhaul during maintenance. It often consists of cylindrical grinding operations, given the very high micrometric precision and quality required. It is therefore easy to understand their need to be able to perform mechanical machining with the maximum possible flexibility and with fewer setups on the machine tool used. For these requirements, the Italian company AZ Spa of Thiene (VI), which has been designing and manufacturing special large cylindrical grinding machines for more than 40 years, stands out.

Sarah Pizzolato, marketing director of AZ SpA says: "Our long experience in the aeronautical sector allows us to offer innovative integrated grinding solutions that are very flexible and customised to individual customer needs. The modular design allows us to create unique machines of their kind, which are highly appreciated by the international aviation industry, direct, indirect EOM and MRO."

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



AZ SpA has an impressive modular range of grinding solutions designed specifically for the aerospace industry

RUA, RUX, RU and RUG for universal grinding machines for external and internal diameters range, to the more specific grinding machines for technical issues to be worked on. These include the AKP range for landing gear grinding machines with gap bed, the GSB range for internal landing gear grinding machines and the LBC range for landing gear orbital grinding machines for external and internal diameters or for asymmetrical heavy parts with rotating table.

Some operating capabilities of the range include: on the RU line the distance between centres from 1,000 to 6,000 mm; swing over table from 400 to 1,200 mm; on the GSB line max internal grinding diameter 350 mm and on the AKP line max swing on the gap 3,600 mm. Different wheelhead configurations are available, wheel diameter range from 508 to 760 mm, which can be fixed or rotating manually at +/- 20°, or automatic with B-axis at +/- 30° or +/- 360° for external and internal grinding processes. There are also the most innovative solutions for Silicon carbide, corundum, CBN and diamond grinding wheels which allow grinding of all aerospace materials, metals and their alloys including chromium and, in particular, those subjected to the most innovative systems for thermal spray techniques, such as H.V.O.F. (High Velocity Oxygen Fuel). The AZ-aerospace range uses the most advanced mechatronic solutions that are all customisable, energy efficient, safe, reliable and comply with Industry 4.0 requirements. For the technical assistance service, in addition to the remote assistance and monitoring services available on the grinding machines, AZ Spa has recently developed an innovative technology called



Different wheelhead configurations are available for internal grinding processes

AZ-SmartService which, thanks to Augmented Reality (AR) technology, helps customers all over the world to connect with AZ technical support. With special AZ-SmartGlasses device, the AZ highly skilled tech support can see through the eyes of the operator and give precise instructions on the correct operation to be performed and in real time.

Sarah Pizzolato explains: "On the other side, the operator can see notes and components highlighted by AZ with the help of Augmented Reality. This technology reduces human errors, the risk of wrong spare part identification and the time of spare part delivery, costs and time in technical assistance."



With AZ-SmartGlasses the operator can see notes and components highlighted by AZ with the help of Augmented Reality (AR)

The AZ-SmartGlasses are already configured and ready to use with an easy interface and preinstalled remote connection application. Just switch them on, connect to a Wi-Fi net and call AZ. This AZ-SmartService technology has proven successful in the recent months of travel restrictions between nations due to the COVID-19 health emergency. Thanks to the AR technology, AZ never stopped and was able to carry out the testing of the grinding machines, the installation by the customer, training, use and maintenance.

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AZ's grinding solutions enable the grinding of faces, shoulders and chamfers

Precision grinding services for aerospace landing gears

For seventy years, Duval Precision Grinding has been committed to providing aerospace OEMs with the highest quality products possible. All forms of aviation depend on landing gears that are safe, reliable, and resilient. Duval accommodates these stringent requirements by embracing technologies such as cutting-edge coordinate measuring machines (CMMs) and fostering the growth of its highly qualified and experienced team.

Qualified and experienced in aerospace component grinding

“Precision is our only product” is more than just a company catchphrase at Duval. Every employee is committed to meeting the growing demand for landing gears and other flight-critical components. As the quality of aircraft components is so crucial, Duval engages a full team of adept operators, machinists, technicians, and programmers. This experience, paired with versatile equipment, allows Duval grinders to grind a wide spectrum of products with tight tolerances. Duval provides grinding services such as inner diameter (ID) grinding, outer diameter (OD) grinding, surface grinding and jig grinding, which allows it to meet exacting specs on a variety of complex, high-performance components with exceptional precision.

Able to handle high tolerances and difficult coatings

Aerospace landing gears and components present unique grinding challenges. The parts must be corrosion-, wear- and thermal-resistant, while also providing the necessary strength to withstand the demanding forces placed upon them by the aircraft.



Although the steel in landing gears is strong and flexible enough to withstand the forces of landing, chrome coatings and high-velocity oxygen fuel (HVOF) coatings are often used to reduce frictional wear and increase corrosion resistance. These coatings tend to be very hard and brittle. Duval's team of experienced grinders is able to work with these materials in a way that won't chip or damage the surfaces of the products.

Heat treatments are available as a way to increase the performance of alloys like 300M and HP9-4-30 to better achieve each customer's goals. However, heat treatments can distort a part, causing it to bend or bow slightly. The Duval team is able to compensate and adjust for these low-level distortions and ensure an even plating layer on the part, keeping components usable and preventing product loss.

Maintain your production schedule

In order to meet increased demands, Duval invested in a new OD grinder, modified its jig grinding capabilities to handle larger parts and expanded its rigorous inspection processes. This additional equipment allows the team to reduce turnaround times and increase the range of part sizes with which it can work.

Customer satisfaction is of paramount

importance at Duval Precision Grinding. There is always someone available to customers to communicate the status of parts and provide quick and responsive service. Manufacturing landing gears and components often leads to delays, often due to engineering changes. By expanding capacity, Duval can expedite its operations and help OEMs get the job finished on time, even if it is already behind schedule.

Duval Precision Grinding is dedicated to exceeding customer expectations and industry demands. This commitment to timely, precise, and reliable service is why aerospace OEMs choose Duval.

For over 70 years, Duval Precision Grinding has been a leading provider in precision grinding services for aircraft parts and other components of various industries including medical, nuclear, and commercial. Customers should always know the status of their parts and that the parts will meet their specifications. With almost 30 highly experienced and committed employees, the company is confident it can perform even your most demanding grinding jobs.

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OTEC SF-HP Stream finishing machine for larger aerospace components

High end surface finishing of metal components used in aerospace manufacturing is essential and can be critical to the part's or an assembly's performance. Depending on the part, this may manifest itself in a contribution to reducing fuel consumption and therefore CO₂, it may show in reduced wear through less friction leading to lower maintenance costs, and often it will be a precursor to the application of advanced hard coatings followed by further surface finishing to remove hard droplets.

For over 25 years, AS9100 certified Fintek has been providing subcontract surface finishing expertise to aerospace precision engineers producing parts such as connectors with difficult to finish threads, turbine blades, blisks, and actuation gears. The company has not only been using machines designed and manufactured by OTEC Präzisionsfinish GmbH, it has also been their agent for exclusive machine supply in the UK. Subcontracting gives Fintek a unique insight from solving real world surface finishing problems, while its close working relationship with OTEC gives them access to world class research and development and the newest machine technology.

Following in the footsteps of the company's advanced stream finishing machines the latest machine from OTEC, the new SF-HP, was launched in Germany at the end of 2020. It is creating something of a stir because it is pushing the boundaries of the size and weight of workpieces that can be precisely deburred, edge-rounded, smoothed and polished to a mirror-like finish in an automated process.



Jonathan Dean, Fintek's managing director, elaborates: "The SF-HP includes many innovations. Significantly larger, workpieces up to 650 mm in diameter and 650 mm long and weighing up to 200 kg can now be accommodated. There are numerous process head and spindle axis settings, giving the ability to fix a highly controlled and precise flow through the process media which also enables the accurate targeting of specific workpiece surface points. This means we can now surface finish items such as larger turbine blades where retaining close tolerances of the blade edge profile is vital to the blade's real-world performance on wing."

Another significant inclusion in the SF-HP, is OTEC's patented 'Pulsfinish' as standard equipment. Until now, this has been an optional addition to their stream finishing

family of machines. The pulse drive technology delivers precisely defined and repeated movement intervals between the process media and workpiece by quickly changing the direction of rotation of the heads. Along with the quick acceleration and deceleration of the heads, these rapid changes in movement increase the finishing forces exerted. Typically, this makes it possible, to deburr, edge-radius and smooth from Rpk 0.3 µm to Rpk 0.1 µm in a single work step in just a few minutes.

The precision of minimal material removal is also enabling stream finishing to be applied to some additively manufactured components. The relatively rough finish following structure removal from AM parts means post finishing is often required to complete a commercially acceptable part. Finishing by hand can be costly and providing internal surfaces are not too complex or fine, these can be quickly transformed by stream finishing in a fraction of the time.

Also integrated into the SF-HP is automation for holding, machining and workpiece change. Where multi-step processes require different media a simple container swap system provides for rapid change-over to keep production speeding along. Operation and programming is via a large and clear 15 in multi-touch colour display. This makes it easy to store repeatable process steps for quick recall and to ensure consistent accuracy, and it also makes training new users much easier.

Fintek deploys a range of stream finishing, drag and disc finishing systems from OTEC and so can advise on the best machine, media and process cycle to achieve a target surface finish. It can supply the machine and expertise to manufacturers who wish to add an SF-HP or any other surface finishing machine to their in-line production. OTEC machines have been designed to be as compact and ergonomic as possible to reduce valuable floorspace requirements.

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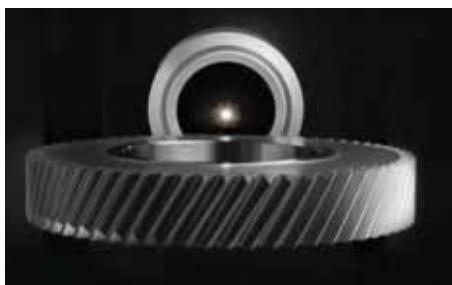
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New white light sensor technology



The initial development stages of optical metrology by Klingenberg were focused on applications used primarily in the lab. However, the solution now available is directed toward series application of cylindrical gear measurement. The primary advantage is greater efficiency through a reduction in measurement times of up to 40 percent.

Klingenberg has systematically advanced optical metrology and has introduced a new white light sensor technology that is ideally suited to measurements in the sub-micrometer range. This will allow the tactile pitch measurement to be replaced by optical measurement, significantly reducing measurement times in serial measurement applications.

The company first presented the initial development stage of its hybrid solution with optical metrology at the EMO Hannover exhibition in 2017. The application at that time centred on digitisation of axially symmetrical gear components. Components such as bevel gears and cylindrical gears, as well as other geometries, can thus be measured with an extremely high point density, followed by additional processing. This additional processing is extremely flexible as, in addition to simply depicting the results as a 3D model, comparisons can be made against a CAD target geometry, while a geometrical evaluation can be conducted by creating sectional views. This application can be used for reverse engineering, for example.

"In the last three years, we have significantly advanced our Klingenberg Optical Metrology system," explains Markus Finkeldey, project manager of Optical Metrology at Klingenberg. "Particularly in terms of sensor systems, measured data acquisition, and further processing, there has been significant progress."

High accuracy in the sub-micrometer range

In the first development stage, a high-precision laser triangulation sensor was used. This sensor technology is well suited to the digitisation application described above.

However, physical limits in laser triangulation restrict its use for measurements in the sub-micrometer range on gear components.

"Because tactile gear metrology on the precision measuring centres over the years has achieved an extremely high level of maturity and thus also an impressive measuring accuracy, our customers' expectations for optical metrology on a Klingenberg measuring machine are correspondingly high," says Peter Mancasola, application engineer at Klingenberg. "A restriction in accuracy that is accepted for digitisation is not acceptable for other measurement tasks."

New white light measurement system

Klingenberg has therefore focused its efforts on the entire signal chain in optical metrology and has joined forces with other development partners to develop a white light measurement system tailored specifically to the requirements of gear measurement. The active, current-carrying elements, such as a high-power light source, electronics and signal processing, are arranged separately from the sensor in the control cabinet. This prevents thermal effects from occurring on the sensor itself as

well as in the area surrounding the sensor, for example on the 3D tracer head.

Compared to a laser sensor, this sensor has a significantly more favorable, compact design. In addition, this sensor works equally in all directions due to the coaxial light directed toward the component surface and back. The large lens aperture enables measurements with highly inclined surfaces, which are inevitable occurrences on gears. Due to the system's high resolution, measurements in the sub-micrometer range are now ensured.

Reducing measurement times in serial measurement

Digitisation of the entire component is an application for which optical metrology is ideally suited. For serial measurement of high-precision ground running gears however, it is not necessary to measure the entire component geometry with a high point density. Instead, the focus is on high measuring accuracy at the level of the tactile measurement while also reducing the measurement time. Klingenberg has worked out a solution to this with its latest development stage in optical metrology.

In serial measurement of a cylindrical gear, the profile and lead are typically measured on three or four teeth, with pitch measurement is performed on all teeth. This tactile pitch measurement necessarily involves inserting the stylus into each tooth space. With optical measurement, nothing is inserted into the tooth spaces and pitch



measurement offers the greatest potential for reducing the measurement time.

Through optical measurement of the pitch using one continuous, uninterrupted rotation of the component, the measurement time advantage increases with large numbers of teeth to up to 80 percent. It is not necessary to scan a large area of the gear with multiple revolutions.

This optical pitch measurement is combined with the tactile measurement of the profile and lead. Overall, the total measurement time decreases by up to 40 percent. In this way, in situations where there is a high utilisation rate of the measuring machine, the costs for the optical metrology option are quickly recovered.

High-precision measuring results

Decreased measurement time is not the only key factor, however. Just as important is a high achievable accuracy of the measuring results, even in the case of extremely complex gears with ground surfaces and steep profile angles. This is the result of intensive optimisation of the sensor technology, the analysis algorithms and the measurement strategy.



Measurement software user interface

The only difference in operation is that optical pitch measurement must be selected in the same cylindrical gear measurement software customers are already familiar with. The measuring cycle is automatically modified accordingly, and the pitch measurement is performed with the optical sensor. The changeover between the tactile 3D NANOSCAN probing system and the retractable optical HISPEED OPTOSCAN sensor takes place automatically within approximately 1.5 seconds in conjunction with the entire measuring run.

During a series of internal analyses, Klingelberg evaluated a typical component spectrum of cylindrical gears from the area of passenger car transmissions, electromobility and gauges. In a range of gear geometries with different reflection

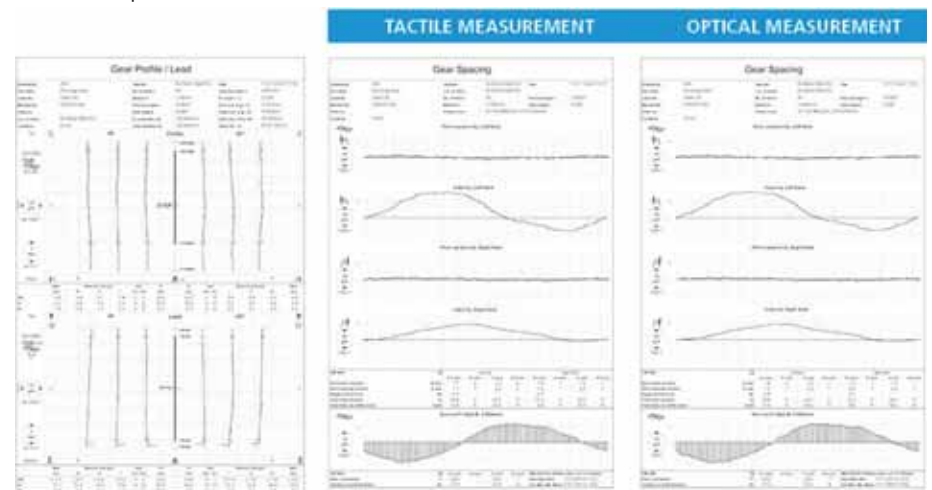
and absorption characteristics, as well as various gearing qualities, accuracy on par with tactile measurement were achieved. The system can be used even for gears with extremely fine surfaces and roughnesses of $R_z = 1 \mu\text{m}$.

"To determine without a doubt whether a component is suitable for optical measurement and whether a corresponding measurement time advantage can be achieved, we provide our customers with test measurements and demonstrations in our premises," says Holger Haybach, head of Application Engineering at Klingelberg.

In terms of the measurement time advantage that can be achieved, the more teeth there are, the greater the advantage. However, even a component with 29 teeth benefits from a significant time advantage, as the examples in the table show.

metrology can reduce measurement time. However, optical measurement is also ideal for fast scanning sequences on complex geometries.

Dr Christof Gorgels, director of Product Line Precision Measuring Centres at Klingelberg, comments: "For the further development of the system, we already have a number of ideas, including tooth root and tip measurement, axis position, roundness and other form measurement tasks. We would also like to use our customers' feedback to set priorities. That is why we are delighted at the keen interest in Klingelberg Optical Metrology and the conversations with users that we have had as a result."



Measuring results, profile and lead (l) Measuring results, pitch, comparison of tactile and optical (r)

		
Toothed gear data	$Z = 75$; $m_n = 1.92 \text{ mm}$; $\beta = 25.3 \text{ degrees}$; $\alpha = 18.7 \text{ degrees}$; $d_a = 162 \text{ mm}$	$Z = 29$; $m_n = 2.2 \text{ mm}$; $\beta = -31 \text{ degrees}$; $\alpha = 20 \text{ degrees}$; $d_a = 79.5 \text{ mm}$; clamping between centers, measurement without axis position
Hybrid measurement, consisting of	axis position (tactile), pitch, gearing concentricity, tooth thickness variation (optical)	Pitch, gearing concentricity, tooth thickness variation (optical)
Total measurement time:	2 min 35 sec	1 min 50 sec
Conventional tactile measurement:	4 min 15 sec	2 min 45 sec

Gear measurement examples

Next development stages

The system offers great potential for further applications. For example, for measurement tasks consisting of tactile operations involving time-consuming individual touches and complex movement patterns, optical

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Master Abrasives installs Micromatic CNC grinding machine

Master Abrasives has installed the Micromatic PLUTO 18 machine at Total Carbide, a leading manufacturer of sintered Tungsten Carbide wear parts based at Westcott Venture Park near Aylesbury, providing an advanced materials and engineering base for Westcott Space Cluster.

Total Carbide was looking for a cost-effective new machine for its tungsten carbide measuring probes. The component has a chamfer on the front corner which was ground by interpolation on their previous machine. The required stock removal was 0.5 mm on diameter and surface finish was 0.4 µm Ra with an outer diameter and length tolerance of +/- 0.25 mm. The new machine was to accommodate a volume of 2,000-3,000 pieces per month with FANUC CNC to grind OD, face, chamfer and corner radius features, allowing a smooth transition for operators and for work to continue in their toolroom.

PLUTO-18 has been specially designed by Micromatic Grinding Technologies to focus on compactness, high-performance and provide an economical grinding solution. It is best suited to produce highly accurate small components and can perform both plunge and traverse grinding operations. The effective guarding design makes it 'total productive maintenance' friendly and its standard configuration makes it adaptable for factory automation too.

A few features of PLUTO-18 include its suitability for batch production of shaft type components with a maximum wheel outer diameter of 400 mm (width 50 mm). A rigid anti-friction wheel head is utilised for better geometrical accuracies and an integrated table provides higher rigidity. PLUTO 18 measures only 1.66 m (W) X 2.2 m (D), which can help to save nearly 30 percent space compared to the footprint of a similar hydraulic grinder. Its customised user-friendly graphics screen helps ease in machine setting and operation.

Kelly Warrington, Customer Services team leader, provides vital assistance from the office for applications engineering support. Kelly worked closely with Master Abrasives application engineering manager Ian Meredith to provide Total Carbide with



Andreas Hohmann, managing director at Total Carbide, with Ian Meredith, applications engineering manager at Master Abrasives



Andreas Hohmann, Nitin Kumar from Micromatic Grinding Technologies and Master Abrasives' Ian Meredith

quotes and information on the Master range. This also included organising shipment to its facility and making contact with engineers to confirm delivery dates for the new machine.

Videos demonstrating capabilities of different machines by Micromatic Grinding Technologies are available on its YouTube channel. Master Abrasives can also show machines in action at its grinding and finishing showroom based in the Midlands, as well as superfinishing devices, metrology equipment and abrasives.

Master Abrasives is an independently owned company providing solutions for industry with a complete range of abrasives, power tools, tool services and machinery and equipment. The Daventry-based company has built an enviable reputation for quality and service that is as strong today as it was 50 years ago. The well-known trademark of 'Master' represents the high-quality product range and services offered by the company worldwide.

Micromatic Grinding Technologies, part of the internationally active Ace Micromatic group, manufactures a wide range of grinders in CNC, PLC and hydraulic versions from its three plants in Ghaziabad near New Delhi. This includes cylindrical, centreless and special purpose build machines.

Versarien plc is an advanced engineering



Chris Whetter, Total Carbide CNC grinding team leader and the engineers are delighted with their new machine

materials group. Leveraging proprietary technology, the Group creates innovative engineering solutions for its clients in a diverse range of industries. Versarien has eight subsidiaries operating under two divisions.

Total Carbide Ltd is part of Versariens hard wear and metallic products division and a leading European manufacturer of sintered tungsten carbide primarily for wear resistant applications and arduous environment.

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Powerful new off the shelf solution for manufacturers of CNC grinding machines

Powerful new software from NUM provides manufacturers of CNC cylindrical grinding machines with an innovative means of adding non-circular grinding capabilities to their products without incurring significant development time and cost.

Non-circular grinding is used in a wide variety of automated manufacturing applications, such as the production of camshafts, crankshafts, cams and eccentric shafts. However, it is an extremely complex task, because the non-circular contour leads to constantly changing engagement and movement conditions between the grinding wheel and the workpiece.

NUM has now added non-circular grinding functionality to its NUMgrind cylindrical grinding software, which forms an application-specific element of the company's renowned Flexium+ CNC platform. It is fully compatible with other Flexium software, from release 4.1.20.00 onwards.

NUMgrind is specifically designed to simplify the creation of G code programs for CNC grinding machines through the use of a highly intuitive graphical human machine interface (HMI), conversational-style 'fill in the blanks' type dialogues or a combination of the two.

Unlike conventional CAD/CAM



workstation tools for generating CNC machine tool control programs, NUMgrind is intended for use in the production environment. It enables shop floor personnel to handle everyday machining tasks very quickly and efficiently, plus the work can be easily shared amongst several people and several machines. The NUMgrind HMI can of course also be run on an office PC.

Application-dependent projects, and the corresponding ISO part programs, can be created, tested with NUM's Flexium 3D simulation software and transferred to the

targeted machine. The operator simply determines the sequence of the grinding process via the HMI and enters the necessary data for the grinding operations, grinding wheels and dressing operations in the dialogue pages. Programming is further simplified by the fact that the HMI is supported by a comprehensive library of predefined shapes, which includes eccentric circles, hexagons, pentagons, polygons, Reuleaux triangles and rhombi. The CNC program is then created completely automatically and stored in an executable form.

The closed shape of the workpiece is defined in the XY plane. However, grinding is performed by interpolating or synchronising the X-axis with the C-axis (workpiece spindle). Axial movement in the Z-axis can also be accommodated, by means of oscillation or 'multi-plunge'. The Flexium+ CNC system's NCK transforms the contour from the XY plane into an XC plane, and calculates the corresponding compensation and in-feed movements, taking the grinding wheel diameter into account. The speed profile is also transformed, so that the speed and acceleration are automatically adapted to suit the physical attributes of the machine.



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KREBS & RIEDEL celebrates its 125th anniversary and gears up for the future

Innovative grinding technology since 1895

The cornerstone of the KREBS & RIEDEL grinding wheel factory in Bad Karlshafen was laid some 125 years ago. Today the family owned company operates worldwide as a manufacturer of individually manufactured precision grinding wheels and impresses with innovation and solution-oriented application technology advice.

Customers from the automotive, aerospace, mechanical engineering, medical technology and wind power sectors rely upon the high-precision products manufactured by Krebs & Riedel. In addition to conventional internal and external grinding wheels, cutting wheels, cup wheels and grinding segments with ceramic and synthetic resin bonds, KREBS & RIEDEL also manufactures CBN and diamond tools with ceramic bonds. The medium-sized family business with over 250 committed employees and an annual turnover of 31 million euros is one of the leading German manufacturers of abrasives. An export share of around 48 percent shows the companies international orientation.

KREBS & RIEDEL has subsidiaries in China and India, as well as 30 international distributors including Advanced Grinding Solutions Ltd of Coventry in the UK. A team of application technology consultants looks after customers worldwide. The company attaches particular importance to research and development and works closely with several research institutions. Important investments in sustainability management and the expansion of the Bad Karlshafen site are currently being planned.

KREBS & RIEDEL is a specialist in the field of gear applications and supplies top gear manufacturers around the globe. These grinding wheels are used on many gear grinding machines, including those from the manufacturers Gleason, Kapp Niles, Klingelnberg, Liebherr, Mitsubishi, Reishauer and Samputensili. Single-profile and composite tools for fine or polishing grinding operations are available to achieve the fine surface quality and high load-bearing proportions. These combinations can be combined and

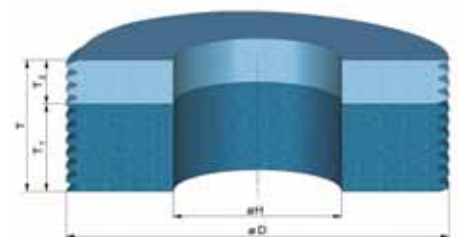


delivered with the tried and tested compositions as well as with the Blue Moon specification. Advanced Grinding Solutions now supplies Krebs wheels to several top UK gear manufacturing companies who are able to call off specially profiled wheels for gear production on fast deliveries. Under agreement Krebs can keep customer's blank wheels in stock and upon order will profile these to suit and then supply within just two or three days.

The effective Blue Moon 147A and 148A wheels for continuous generating gear grinding increase economic efficiency through extended dressing cycles and increased removal rates in the grinding process. By using special abrasive grain geometries and proportions in connection with an optimised pore space design, a very high level of ease of cutting with little heat input and high cutting performance is achieved. Unprofiled or pre-profiled for modules 1-12 in the highest quality according to customer specifications for grinding speeds of up to 80 m/s.

Continuous generating grinding with fine and polishing zone

KREBS & RIEDEL produces a wide range of dressable grinding worms with a ceramic bond for your gear machining. All



specifications guarantee the highest profile accuracy with the lowest thermal loads on the workpieces. The combination of our

grinding worms with fine-grain or polishing worms creates powerful tools that enable grinding and polishing in one application. The following design variants of the compound screws are possible: unprofiled or pre-profiled forms for modules of 0.8-5, with larger modules possible upon request.

KREBS & RIEDEL offers a new carbon fibre base body variant for CBN and diamond abrasives. The proportion of carbon fibre guarantees maximum strength with the lowest weight. The body is up to 75 percent lighter than a comparable steel body. In addition to easy handling during assembly, extremely smooth running is achieved. This means that the load on the grinding spindle is lower. In addition, they offer significantly better damping behaviour than conventional base bodies. This is with interrupted cuts and grinding processes with changing contact conditions. In addition, the carbon base bodies are often used when machining small filigree components. The grinding behavior is more harmonious and leads to improved surface quality.

With the new CBN wheels, an increase in productivity can be achieved through increased stock removal with an improved service life. Thanks to the fact that the base body can be reassigned, good economic efficiency is also achieved, despite the higher material price. Therefore, it is not just a short-term thought, but a trend that will also prevail over the long term. The working speeds are up to 100 m/s. Depending on the composition, higher working speeds can also be achieved.

Managing director at Advanced Grinding Solutions, Chris Boraston comments: "When selling very high precision grinding machines that cost from £250,000 to well over £1,000,000, it's clearly important that only the very best grinding wheels are used



and indeed these are the only way in which we can fulfil and exceed our customer's expectations.

"KREBS & RIEDEL is very process focused and studies a customer's application in detail before suggesting what type of wheel should be used. They certainly do not simply offer an alternative to an existing wheel and prefer to look very hard at the application and to offer wheels based upon their own experience rather than someone else's. Furthermore, we can rely upon the support of technical engineers who will also help set-up a customer's grinding machine to ensure that test wheels on trial bring the results that are necessary in terms of large improvements in quality, cycle time, or often both.

"Such has been the success that we have had here in the UK with KREBS that we now hold an extensive stock here for same day/next day delivery to our UK customers and this stock holding is growing as more and more engineering companies discover the advantages in improved part quality and in cost savings that KREBS wheels brings to them. Furthermore, unlike some other

grinding wheel companies, KREBS understands that many end users do not want to purchase lots of wheels for stock if that can be avoided and therefore for most grinding applications there is no real minimum order quantity and where there is we are also able to retain wheels here at our base in Coventry and only supply and invoice as customer's actually need them.

"Some of our UK customers literally only order a single wheel from us two or three times a year, while others have several hundred wheels every month. Some buy large CBN wheels that can be expensive and others need small internal grinding wheels for bore grinding or jig grinding applications. KREBS is able to support all customers both large and small and that's very important indeed to us, as is their amazing track record of never having been late in supply on their quoted delivery time of a single wheel over the many years we have been doing business with them."

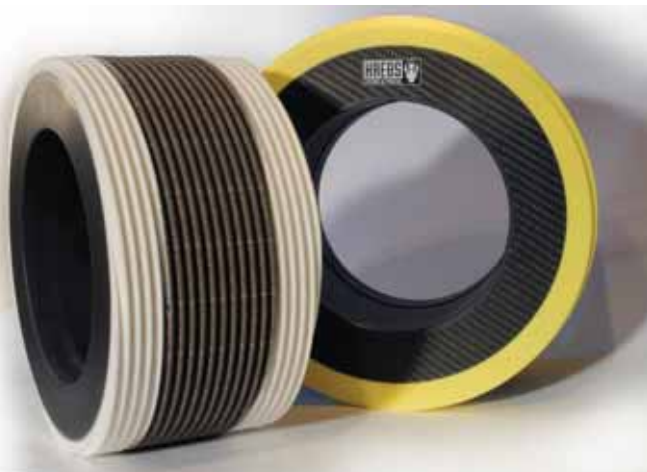
Customers wishing to improve their grinding processes are invited to contact AGS who can arrange for free of charge test wheels to be made available to prove out the superior quality and efficiency that is achieved when choosing the latest wheel technology from KREBS & RIEDEL.

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New heavy duty carbide burr range

Master Abrasives has developed a brand new range of heavy duty (HD) cut carbide burrs for high stock removal, now available from stock.

The new Master HD burrs are designed specifically for high stock removal applications. The unique geometry makes the burrs run smoother, last longer and reduces hand arm vibration (HAV) levels.

As well as providing excellent stock removal, Master HD burrs are suitable for blending cast lines, digging out and radius work. They are ideal for use on materials such as WCB carbon steel, stainless steel, duplex, super duplex and nickel based materials.

Sales and business development manager, Andy Wright states: "We developed these burrs as a solution to help manufacturers improve productivity and grinding performance. Our sales team has been testing the HD cut in various applications with excellent results, finding an impressive improvement in stock removal and smoother grinding performance."



The new heavy duty carbide burr range from Master Abrasives. Cylindrical ball nose, oval, ball nose tree and ball nose cone shapes are available

Available shapes include the cylindrical ball nose, oval, ball nose tree and ball nose cone. A selection of popular sizes is now stocked and available for application trials. Other shapes and sizes can be made to order in Master Abrasives' high-quality carbide.

A brand new product video has been

launched to show the selection of burr shapes available, the unique geometry and demonstrate the burrs in action providing excellent stock removal. The video is now available to watch on the Master Abrasives YouTube channel.

To discuss application requirements, contact the customer service team or your nearest distributor.

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Master Abrasives

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New agencies give Advanced Grinding Supplies the 'cutting edge'

Gloucester-based Advanced Grinding Supplies Ltd has been appointed as the exclusive agent in the UK and Ireland for both Meister Abrasives and Alfons Schmeier Abrasives. As a distributor and agent for several of the world's leading cylindrical grinding machine manufacturers and also for numerous high-quality grinding tooling and consumable companies, the prestigious new agency lines further expand Advanced Grinding Supplies' already comprehensive grinding related offering.

Meister Abrasives offers a broad range of abrasive solutions, from the very smallest bore grinding applications of 1.3 mm diameter up to surface grinding applications using 1,500 mm diameter tools, all to specific customer designs. CBN, DIA, conventional and Ceralox tools are used, depending on the application.

Schmeier Abrasives provides internal grinding wheels and fine grinding media made of CBN, diamond, silicon carbide and

corundum in a ceramic bond, in conjunction with threaded and cylindrical shanks, plus grinding spindle extensions and dressing tools. Satisfying a wide range of functions, the company's quality grinding tools are offered in sizes from 0.8 mm to 180 mm and are available in a wide variety of shapes.

Advanced Grinding Supplies director Peter Harding enthuses: "Advanced Grinding Supplies' excellent reputation is founded on the first-class service we provide, our in-depth engineering knowledge and, not least, the high-quality and cost-effective nature of the products we supply. We are therefore delighted to have recently been appointed as the sole agent for the technically superior Meister Abrasives and Alfons Schmeier Abrasives brands for the UK and Ireland.

"Many current users of Meister and Schmeier products are companies that we already supply tooling and consumables to or are users of machines we are UK agents



for, such as STUDER. The important new agencies represent a perfect fit for our company and will ensure a seamless transition for existing customers and also allow us to further expand our activities. These globally renowned brands complete our now comprehensive abrasives offering and will deliver a wide range of technical and cost benefits to our customers."

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TYROLIT diamond dressers

Understanding the true cost of consumables

A new set of challenges driven by a global pandemic has been game changing for the aerospace industry, with the need to drive down cost and increase efficiency in every corner of its business. The requirement for closer collaboration with strategic partners can be a sure-fire way to achieve a common goal. When those companies have decades of experience, operate on a global scale and focus on innovation, the outcome can be world-class.

TYROLIT has a wealth of process knowledge and employs specialists from many fields of manufacturing to deliver both product and application engineering technology. Having mutually beneficial relationships with key industrial partners has been fundamental to TYROLIT's growth and success over the years.

The modern aero engine is an engineering accomplishment with few rivals. Using cutting-edge material science, design and manufacturing methods, it is possibly the most complex mass produced product in the world today. Despite the down turn created by COVID 19, the long-term projections for the aerospace market still predict large growth with increases in volume driven by increased passenger numbers, as well as the need to improve fuel efficiency and cut pollution levels.

The production of turbine blades represents a substantial part of the overall manufacturing costs. The turbine blade is subject to harsh conditions inside the engine. A modern blade can see temperatures in excess of 1,370°C (2,500°F) in a commercial engine and upwards of this

in military applications. High stress and vibration in addition to this could easily lead to blade failure. However, due to design expertise and first-rate material science, industry leading turbine blades perform efficiently in these strenuous conditions. Yet the same exacting design conditions and high-end material performance lead to unique manufacturing challenges.

While efficiency is ever important, consumable expenditure remains a significant factor in the overall manufacturing costs of an aero engine.

The manufacturing engineering team at a leading production facility has highlighted spend on diamond dresser rolls as a key target for cost reduction. The diamond dresser roll is a high precision consumable for CNC grinding platforms, which allows extremely accurate full form profiles to be dressed onto the grinding wheels quickly and efficiently. Diamond rolls are a very high value consumable and often seen as a key way to reduce costs within the process.

Manufacturing engineers insightfully realised that merely targeting a reduction in



costs for this component may not necessarily offer the greatest returns. Instead, the engineering team worked closely with TYROLIT to better understand the failure mode of this consumable item. The engineers identified key high detail features, such as small radii and with reduced surface area which is accurate to just a few microns, which not only makes them expensive to produce but also results in premature wear and short life.

Through monitoring of the process and feedback of information to TYROLIT, a better understanding of the wear profile was achieved. Additionally, a greater appreciation was gained of the impact that the secondary finishing operations had on individual diamonds within the roll. Utilising the in depth component knowledge of the engineering team and the pioneering super-abrasive manufacturing methods of TYROLIT, a bespoke turbine dresser roll was designed and manufactured. As part of TYROLIT's next generation diamond dresser approach, polycrystalline diamond inserts were utilised to support the profile and maintain the high accuracy demanded of turbine dresser rolls. Yet even with a higher cost, it still offered significantly improved wear performance.

An additional key feature of this roll is TYROLIT's right first time approach to production, maintaining extremely tight manufacturing tolerances throughout the process, which reduces or eliminates the need for a secondary finishing process to be required on the diamond dresser roll. This results in an extremely sharp macro surface and increased utilisation of the diamond.

As with any process, increased control brings with it increased costs. However the production team carried out monitoring and analysis of the dresser to understand the true process costs rather than the headline price of the dresser itself. Understanding the process in this way is key to understanding the true value of the consumable.

A bench mark was taken across two turbine products currently being produced by two different competitors to TYROLIT, at differing price points. Throughout the process competitors prices remained confidential, however, it was disclosed that in both cases the TYROLIT product had a higher initial purchase cost.

On the first component, part for part, the TYROLIT roll produced more than three times as many components as the competitor product. Taking into account the



increased purchase cost it was reported that the TYROLIT product offered a 53 percent cost saving over the year on a consumable cost-per-part basis.

On analysis of the second component, again the TYROLIT product offered in excess of a threefold part output before roll failure. When taking into account the purchase costs, the result was a 63 percent saving over the year. Due to the cost savings being so both remarkable and clear, plans are afoot to introduce this product onto all lines.

This is just one example of where close collaboration between innovative partners can generate excellent returns. Improvements of this magnitude can only be achieved by resisting the easy route of driving down PRICE to make initial short-term gains, but by understanding the problem and utilising expertise in the supply chain. This leads to better solutions, which in turn ultimately improve both COST and efficiency to create true VALUE.

TYROLIT diamond roller dressers - engineering excellence and quality

TYROLIT diamond roller dressers are manufactured by the reverse plating process. This production method allows the largest possible diamonds to be used and guarantees maximum profile accuracy and dimensional precision with minimal wear. TYROLIT diamond roller dressers are used mainly in the turbine, automobile and tool manufacturing industries. They are ideal for

the following grinding processes: CD / non CD (Continuous Dressing) HSCD (High Speed Continuous Dressing) IPD (In Process Dressing) High-speed pendulum grinding.

TYROLIT diamond roller dressers are subjected to quality control throughout the entire production process. Only in this way can shape, position and profile tolerances with micron accuracy be reliably assured. Modern measuring processes document the quality achieved with each individual roller dresser. Every TYROLIT diamond roller dresser is supplied with a test piece and a test certificate.

Thanks to the latest manufacturing, processing and measuring techniques, we are able to guarantee the highest quality and precision. The shortest lead times and speedy, personalised attention to customer requests round off the service offering of this production unit.

A complete grinding system from a single source

The function of a profile roller dresser is to achieve a geometric profile and the desired wheel topography. The coordinated system of the TYROLIT diamond roller dresser with the corresponding grinding wheel reduces thermal stress on the work piece, enabling you to achieve optimum grinding results.

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Choosing a grinding wheel

Weiler Abrasives boasts an extensive line of abrasive grinding wheels designed to deliver the performance welders and fabricators need to get the job done right and done fast.

Weiler has grinding wheels made for working on all metals in both Type 27 and Type 28 designs. These wheel styles each have triple reinforcement for added stability in aggressive applications but differ in their profile to offer unique advantages:

Type 27 wheels have a flat profile with a depressed center that performs best between 25 and 35 degrees. However, effective stock removal with these wheels is achievable at working angles up to 45 degrees.

Type 28 wheels have a concave design that is aggressive at lower working angles and increases access to tight spaces. Their optimal performance angle is between 0 and 15 degrees from the surface.

Grinding wheels are mixed combinations of resin and abrasive grains. The abrasive does the work and grinds metal when it makes contact with metal surfaces, while the bond holds the abrasives in place and helps the wheel keep its shape. Choosing a grinding wheel with the right composition for the application and material will ensure consistent results and continuous efficiency.

Grinding wheels come in different exterior diameters made to accommodate different size grinders. The inner diameter is also important to note. Wheels attach to angle grinders on a spindle, known as an arbor. Arbor size varies, and an exact match for the grinding wheel ensures a secure fit. Weiler's lineup of grinding wheels offers compatibility with 5/8-inch and 7/8-inch arbors, and includes wheels with 5/8-11 threaded arbor hubs for easy spin-on/spin-off mounting.

Aluminum is a preferred material for countless metal fabrication applications due to its lightweight and natural resistance to rust and corrosion. While only weighing around 30 percent as much as steel, aluminum can be just as strong and sometimes even more durable when made in the proper alloy.

Tiger Aluminum grinding wheels are ideal tools for working on aluminum-based alloys. This silicon carbide grinding wheel is enhanced with an aluminum oxide blend for a consistently high cut rate throughout the



wheel's life. A non-loading formula keeps the wheel from gumming up, allowing operators to get more work done in less time without compromising durability. Tiger grinding wheels for aluminum are contaminant-free, so there will be no after-rust.

The most important factor when grinding stainless steel is to use contaminant-free or INOX wheels. This designation means the wheels are manufactured with additives that contain less than 0.1 percent iron, sulfur and chlorine. Weiler grinding wheels overcome this challenge and there are two options available:

Tiger Ceramic are the Max Performance option. These stainless steel grinding wheels have the fastest grind rate of the entire line and feature innovative ceramic alumina grain. This contaminant-free grain rapidly cuts through stainless steel at low temperatures to prevent heat damage.

Tiger INOX grinding wheels are free of contaminants and feature bonded abrasives made from white aluminum oxide grains specifically manufactured for working on stainless steel. This grinding wheel delivers a fast cut rate and long product life on stainless steel.

Weiler Abrasives manufactures several different grinding wheels for use on carbon and structural steel. These leading-edge grinding wheels are all dependable, consistent and made to last:

Tiger Ceramic: Tiger Ceramic grinding wheels are Weiler's most versatile grinding wheels. They are also the most effective,



featuring grains that continually sharpen for reliable results and maximum time on the job. Cool-cutting Tiger Ceramic wheels will produce minimal discoloration on carbon and structural steel workpieces.

Tiger Zirc: If a high-performance option is required, Tiger Zirc grinding wheels produce optimal results. These wheels have a zirconia alumina grain infused with advanced ceramic alumina for added boost in cut rate.

Tiger AO: The performance line offers the Tiger AO grinding wheel. Tiger AO grinding wheels have a hard resin bond that lasts a long time and contains aluminum oxide grains that will provide an even, clean and sharp cut.

Wolverine: If there are industrial-grade grinding requirements, Wolverine grinding wheels are the best buy. These wheels provide the rapid cut rate and consistent performance needed at a good value to keep operating costs low.

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Effective LEV ensures workplace air is clean and safe to breathe

By Carl Latham, divisional sales director (Aftersales), Filtermist Systems Ltd

The Health and Safety Executive's (HSE) current manufacturing sector plan includes an inspection programme targeting fabricated metal premises in a bid to reduce incidents of occupational lung disease.

The recently published HSE Health and Safety at Work, summary statistics for Great Britain 2020 states that there are still approximately 12,000 deaths from lung disease every year as well as an estimated 48,000 people who worked in the last 12 months who currently have "breathing or lung problems" they regard as caused or made worse by work.

Based on those currently with breathing and lung problems and who had ever worked, the following factors were identified as causing or making their ill-health worse: airborne materials from spray painting or manufacturing foam products in 13 percent of cases; dusts from flour, grain/cereal, animal feed or straw in seven percent of cases; airborne materials while welding, soldering or cutting/grinding metals in 10 percent of cases and dusts from stone, cement, brick or concrete in nearly 20 percent of cases.

A range of lung diseases can be caused by exposures in the workplace, including: respiratory cancers, including lung cancer and mesothelioma; Chronic Obstructive



Pulmonary Disease (COPD); silicosis, asbestosis and other forms of pneumoconiosis; occupational asthma; diffuse pleural thickening and pleural plaques; allergic alveolitis and byssinosis.

Employers have a legal responsibility under COSHH (Control of Substances Hazardous to Health) Regulations 2002 to protect employees from exposure to any substance considered hazardous to health.

A hierarchy of controls should be used to identify the most effective control measure for each situation, but the HSE generally recommends using Local Exhaust Ventilation (LEV) on all CNC machine tools as the most effective way of controlling contaminated air at source.

LEV systems capture, contain and treat air contaminated with oil mist, fume, smoke and dust at source before it has an opportunity to escape into the wider working environment. The term 'LEV' means a system that includes a hood, or multiple hoods, ducting, a filter, a fan and a discharge mechanism.

LEV TExT reports

For those employers that have installed LEV systems on their machine tools, COSHH regulations require thorough examination and testing (TExT) at least once every 14 months by a competent person. Some applications require more frequent testing: these include processes in which blasting is carried out in or incidental to the cleaning of metal castings in connection with their manufacture which require testing once a month and processes giving off dust or fume in which non-ferrous metal castings are produced which require TExTs once every six months. Full details can be found in HSE



publication HSG258 - Controlling airborne contaminants at work: A guide to Local Exhaust Ventilation (LEV).

COSHH Regulation 9.4 states that in addition to regular testing, 'every employer shall keep a suitable record of the examinations and tests and of repairs carried out as a result of those examinations and tests and that record or a suitable summary thereof shall be kept available for at least five years from the date on which it was made.'

The HSE recommends including a wide range of information in LEV Test Reports to ensure an accurate record of both the LEV system and the examination results. It seems like common sense to experienced LEV engineers to include as many details as possible, but Filtermist still hears from customers who have been given a one-page summary sheet as the outcome of an LEV Test. This is all very well until there is a problem and it proves difficult to back-track and cross-reference with previous test results.

Ideally, LEV Test Reports should include the following information: initial risk assessment; safety policy; method statement; customer name and date

examination took place; reference number for system that the report relates to; substance / process being controlled; a photo of the LEV system and product reference; details of the systems intended performance; test point details including photos or schematic drawings; quantitative assessment readings and details of any repairs required; statement of competency for the test engineer and report observations and recommendations for improvement

Operator checks and servicing

As well as the legal responsibilities employers have under COSHH, employees are also required to play a part in ensuring any control measures are working effectively. Operators should report any defects in the LEV system 'forthwith' to ensure any performance issues can be addressed as quickly as possible. Using a visual aid such as a pressure gauge or monitoring system helps employees to fulfil this obligation. Machine operators should also undertake and log daily, weekly and monthly checks. Ideally manufacturers of LEV systems should supply a user manual and LEV logbook at the point of sale to

support this requirement. Regular servicing by experienced engineers is also recommended for many LEV systems as this enables any issues to be identified and resolved in between routine LEV Tests.

No-one should contract a lung-disease as a direct result of their working environment so everyone has a role to play in ensuring the air in their workplace is clean and safe to breathe.

Useful links

COSHH essentials sheets:

<https://www.hse.gov.uk/metalworking/ecoshh.htm>

HSE publication: Controlling airborne contaminants at work A guide to local exhaust ventilation (LEV):

<https://www.hse.gov.uk/pubns/priced/hsg258.pdf>

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"An absolute Godsend"

Refined Alloys is a brand-new company opened in February of 2020, that prides itself on its refurbishment, repair and remanufacture of alloy wheels to industry standard achieving OEM quality.



Due to the COVID-19 restrictions, the company had to close its doors on 23rd of March with many other companies in the automotive industry having to do the same.

However, the reopening on the 4th of May has seen a flurry of work come in and the company's AirBench is really starting to show its worth.

"The bench is an absolute Godsend; we can't do without it," says Refined Alloys' Sophie Attarid.

Refined Alloys opted for a FN189784A type unit, with single stage filtration perfect for rubber and aluminium dusts. The bench is used when dismantling wheels which are then taken to be prepped and cleaned and after wet or dry blasting, the bench is utilised once more to sand down any rough edges of aluminium before lacquer/paint is applied or the wheel is diamond cut.

"The AirBench is on all day every day, you can really notice the quality," adds Sophie Attarid.

The unit was also supplied with rubber matting which helps protect both the tyres

and the AirBench surface from any minor scratches that would be detected in the level of finish desired by Refined Alloys.

During AirBench's visit, it was clear Refined Alloys run a well organised, tidy, and clean operation, where the unit fits perfectly into their stages of preparation.

"Customers often comment on the cleanliness of our workshop, I'm convinced its 90 percent down to the AirBench," says Sophie Attarid. She goes on to describe her overall AirBench experience: "Easiest company to deal with, Simon Cook's a very nice guy who always kept to his word, from start to finish. The bench was ordered, payment was made, we were given a date, the bench arrived on the date given and we were called beforehand and given notice of when it would arrive."

For more information, contact:

AirBench

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Limited edition at the start

KEMPER optimises CleanAirTower and increases its performance

With the comprehensive relaunch of the CleanAirTower, KEMPER has promoted its established general ventilation system to a higher level of protection. The extraction technology specialist has optimised the filter tower in terms of extraction capacity, plant safety, service life and design.

“Our CleanAirTower is the ideal addition to any air pollution control concept,” emphasises Björn Kemper, chairman of the board of directors of KEMPER GmbH. “In this way, metalworking companies effectively ensure the protection of their employees in welding and cutting processes, especially those with a high or very high risk potential.”

Highlights include: filter life extended by 20 percent; greater plant safety thanks to new pinball method; introduction of the first 150 general ventilation systems in black.

Pinball method for greater plant safety

Thanks to a completely redesigned internal construction, the extraction capacity increases by 10 percent compared to the previous model. The newly developed pinball method prevents sparks and coarse particles from penetrating the filter and damaging it. Because they collide with special sheet steel elements on the inside, their energy is automatically extracted.



Thanks to the innovative air flow, the filter life is extended by 20 percent compared to the previous model.

In the new CleanAirTower, KEMPER has completely redesigned the head of the filter tower. Extraction openings are no longer located circumferentially on the side, but in the cover of the general ventilation system. A new tornado principle at the head of the filter tower ensures that the contaminated air is drawn in with a very high degree of efficiency. The optimisation also changes the design of the filter tower head. The element can be retrofitted in existing systems.

Indispensable for high risk potential

As part of a mix of measures for effective occupational safety, the CleanAirTower is the ideal supplement to source extraction. Especially for welding processes with high to very high potential risk, the general ventilation system helps to comply with limit values and ensure a high level of occupational safety. This means the CleanAirTower also ensures that employees at surrounding workplaces are effectively protected from welding fumes. It separates more than 99.9 percent of alveolar dust particles that could enter the bloodstream.

The general ventilation system from KEMPER operates according to the recommended principle of layer ventilation. Automatic dust removal means that operation is uninterrupted. Welders dispose of the hazardous substances completely free of contamination. The optimised internal construction also reduces the cleaning effort.

Since the general ventilation system feeds the cleaned and heated air back into the hall, companies can save up to 70 percent of their heating costs. Instead of a one-off investment, the CleanAirTower is also available as a leasing model at attractive monthly instalments. For the market launch, KEMPER is bringing out a #nextlevel edition.

KEMPER GmbH is a manufacturer of extraction plants and filter systems for the metal processing sector. The medium-sized, family-run business based in Vreden, Westphalia, is the technology leader with its highly efficient filter systems that filter even ultrafine dust particles from the air when welding fumes are generated. The product portfolio includes extraction tables for cutting processes and the entire accessory chain for industrial safety and air quality management for the metal processing industry.

KEMPER was founded in 1977 and has today more 400 employees. The management consists of Björn Kemper, Michael Schiller and Frederic Lanz. As well as headquarters in Vreden, Germany, the company also has a production site near Prague in the Czech Republic. It is represented worldwide by over ten branches and more than 50 permanent trading partners.

KEMPER (UK) Ltd
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Smart controls for central vacuum systems

Dustcontrol UK has entered a new era of smart technology with the launch of two comprehensive control systems that are set to cover up to 90 percent of its stationary units worldwide.

Both high on energy-saving and environmentally friendly, the new Smart Panel and Base Panel will be a gamechanger in the way its stationary machines are operated, offering a high degree of functionality and automation as standard.

The Base Panel is a standardised and configurable product with a clear and simple definition of functions and built-in frequency drive. It has been developed as a compact and efficient control system suitable for Dustcontrol UK's central vacuum systems.

Taking Dustcontrol UK into the era of industry 4.0, the Smart Panel comes in a compact, standardised format and delivers a configurable solution suitable for the majority of Dustcontrol's more complex installations. It will be used in combination with an energy-efficient, externally mounted frequency converter for starting and controlling the motor.

James Miller, managing director of Dustcontrol UK, says: "The new control systems will make our stationary units more modernised and efficient than ever. We will now be able to offer a connected, comprehensive solution for both service and maintenance, filling in the demand of a more automated solution applicable to nearly every imaginable setup."

"The Base Panel has been necessary to guarantee simple effectiveness and ensure that our customers with smaller central vacuum systems get the best solution for their specific system. The Smart Panel will provide our customers with a system that offers extended standardised functionality and connection possibilities in an energy, cost-efficient, and environmentally friendly way.

"Ultimately, the new technology will give us significant benefits in terms of preventative maintenance, as well as helping us provide better service and support to our customers."

Smart Panel is delivered ready to be connected to Dustcontrol UK's Cloud-based



solution, enabling data logging, monitoring, and control of the system. Connection can be with either a fixed connection or a 4G connection via a SIM card. The comprehensive solution including service and maintenance was available from last autumn.

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No particles escape this quality

Mechanical and electrostatic filtration systems by LTA Lufttechnik reliably separate unhealthy or efficiency reducing pollutants as well as improve indoor climates and prevent wear.

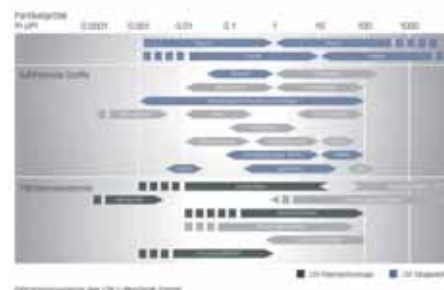
Viruses, bacteria, pollen and other germs can be found on surfaces and in the air. Their concentration can reach particularly high levels in closed rooms. Filtration systems significantly reduce the concentration of these harmful substances. They filter harmful pollutants such as pollen and spores from the air. Viruses measure between 0.05 and 0.12 µm in size.

In the case of viruses and germs, the use of electrostatic filtration systems with HEPA post-filters (High Efficiency Particulate Air) is recommended. These filters have an efficiency factor of over 99.95 percent and can separate particles larger than 0.01 µm. HEPA post-filters are ideal for high-traffic areas such as manufacturing plants, conference rooms, open-plan offices, cafeterias, and waiting rooms. In addition, electrostatic filtration systems have

disinfecting and odour-eliminating properties that kill off viruses and bacteria and substantially improve indoor climates. In the mechanical and metalworking industries, turning, milling, and grinding can all produce oil and coolant mist. Oil mist consists of particles from coolants, which become suspended in the air as aerosols. These microparticles or aerosols of approximately 1 µm in size are hazardous to health and reduce the efficiency of machine tools, while also contaminating machines, measuring devices, floors, and production halls.

Electrostatic or mechanical filtration systems with an efficiency factor of over 99.9 percent improve production conditions by reliably protecting employees in their places of work. Reusable, low-maintenance filter elements increase the sustainability and cost-effectiveness for the entire production chain.

As is the case with oil mist, dust and smoke produced during metalworking and production are also hazardous to health and



increase wear. Mechanical filtration systems for dust improve health, working conditions and production safety.

LTA Lufttechnik GmbH belongs to the JUNKER Group and manufactures air filtration and fire protection systems for trade and industry.

The JUNKER Group, headquartered in Nordrach, Germany is the world leader in the production of CBN high-speed grinding machines. Close to 1,500 employees worldwide maintain the company's technological edge.

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Making the most of metrology

The benefits of integrating metrology into the production process

Manufacturers are under pressure to increase productivity to meet rising customer demands for high quality products, while simultaneously cutting costs. While it is a vital process, end-of-line measurement is traditionally perceived as time-consuming and a hindrance to manufacturers' goals to improve productivity. Here, Mike G John, head of engineering at industrial metrology specialist, The Sempre Group, explores how integrating metrology into production can transform the process from a hindrance to a valuable asset:

Manufacturers commonly treat production and quality separately, using measurement equipment as a last step to verify the part and prove compliance. This can cause issues as it becomes too late to rectify any faults, wasting valuable production time and resources.

Consequently, it becomes unclear why parts, such as bearing surfaces, are not up to specification or aren't industry compliant. The manufacturer does not know at what stage things went wrong, let alone why. Overworked metal, for example, may be caused by inaccurate temperature sensors, but checking the part at the end of production prevents the manufacturer from identifying and rectifying the issue as soon as it occurs. Armed with little information, manufacturers face broad sweeping reworks that can delay production and pile on added costs.



Finding faults so late in production can be costly to the manufacturer and slow productivity. Manufacturers should therefore stop using metrology as a policing mechanism and start using it as a tool to increase productivity. A more integrated process would allow them to quickly isolate compliance issues and rectify them with tool changes, probe realignments or other quick improvements, before product quality is affected.

Without streamlined communication between metrology and production, it can also take anywhere up to two weeks to get a product from the shop floor into the quality

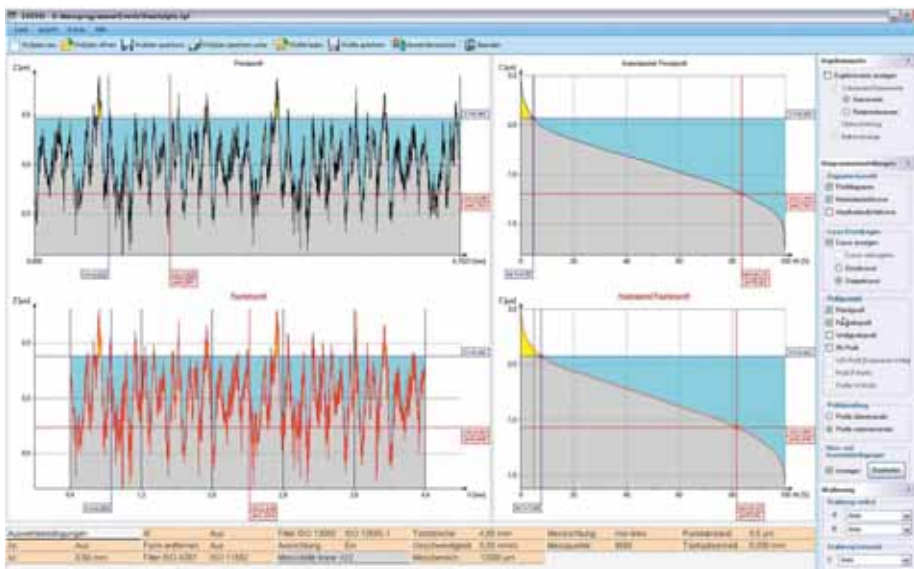
department creating a huge bottleneck in the process. By incorporating metrology equipment to perform continuous inspection directly on the line, manufacturers can reduce scrap rates, minimise rework and remove delays. Quality also increases as parts are inspected at multiple stages, so it is easy to identify and rectify issues as they occur.

Let's put this in context. A scrap rate of just five percent can wipe out up to 95 percent of your profit, depending on margins. The bottom-line benefits of bringing metrology and production together can be huge.

Integration

Shifting approach doesn't involve an entire overhaul of a production line, but the incorporation of a series of steppingstone technologies. A good first step is to choose smaller parts that are easy to measure and purchase technology to inspect them on the production line using a basic solution. For example, data loggers offer a compact, battery powered technology to sample temperature data from a range of parts and could provide valuable insights, ensuring that parts do not overheat, which can compromise the final finish.

The manufacturer can then move onto larger components while incorporating a wider array of measuring systems. These may include non-contact solutions like



Opticline for shaft parts, Micro-Vu visual CMM for small prismatic components or planar field of view scanner for flat parts. Many of these have the option to be automated with robots and other processes to further improve productivity and connectivity in the age of Industry 4.0.

For instance, a Scottish manufacturer approached us because it needed help improving its grinding productivity. We developed a bespoke optical shaft measurement program and ran some trials, proving it was repeatable across its processes. The result was a zero percent scrap rate and it could spend more time manufacturing, rather than reworking, its parts.

Automating surface finishing

Having automated and programmable equipment, such as robotic arms, can also make surface finishing quality checks easier. Automotive manufacturers can check the surface finish of combustion engine cylinders by manually placing a component in front of a bore inspection probe, such as the NovaCam bore inspection. To avoid this manually repetitive and time-consuming process, manufacturers can invest in a robot arm. The robot can automatically place the components, so metrology equipment can automatically check for any points where excessive friction or surface faults could cause the pistons to stop moving. Automating these tasks also allows staff to be removed from low value, monotonous jobs and into more important and manual areas of the business, further boosting productivity.



Wireless connectivity of static and portable equipment, such as the Jenoptik Waveline handheld series, to the Industrial Internet of Things (IIoT) creates a factory-wide data collection network. Operators can quality check surface finish on the go and easily transfer data through Bluetooth® connection. Data analysis can then be easily shared with customers to show the quality of the products throughout the production process. Monitoring data in a connected way allows manufacturers to detect trends in production and take proactive steps to reduce wasted and faulty goods.

Ditch the paper

Traditional paper systems for reporting increases the risk of human error, reduces traceability and increases the difficulty of accessing key information. By investing in Industry 4.0 technologies and digitising quality management, manufacturers can have full control over their measurement data across production. They can then use this information to make better business

decisions, improve traceability and increase productivity.

Using paper and isolated data storage systems, such as Excel, can cause unnecessary quality checks to occur. Consider this example, a hydraulic actuator supplier has used roughness and contour measurement equipment, such as the Jenoptik W800 series, to ensure the component is aerodynamic and compliant with aerospace regulations, before sending it to the manufacturer. The manufacturer's paper-based system does not have access to the digital measurement data. They are forced to replicate the supplier's measurements and waste time, rather than accessing the relevant data on its EQMS. By investing in integrated data collection software, such as ProLink QC Calc Real-Time software, quality data can be automatically collected, monitored and used to drive compliance reporting between stakeholders.



Accurate surface finish is also a must for highly regulated industries, such as medical device manufacturing, where components such as hip implant stems require a particular surface roughness to effectively fuse to the femur. Bringing metrology into production allows manufacturers to take control of quality management and have full visibility of their processes. Manufacturers can easily comply with strict regulations, such as ISO 17025 ISO 9000, 21 CFR part 11 or AS9100, to provide evidence of accurate, high-quality and traceable data.

To meet rising customer demands for high quality products, while keeping down costs, we suggest manufacturers integrate metrology throughout their production process.

By investing in Quality 4.0 technologies and digitising quality management manufacturers can make data backed decisions and have better understanding of their processes.

The Sempre Group

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Steering housing production with Engis single pass bore finishing

For many hydraulic and automotive honing applications, Engis Superabrasive Single Pass Bore Finishing offers the best of both worlds: high precision tolerances in a large scale production environment. Development over many years has led to significant advances in bore size, geometry and customisable surface finish, so much so that bore size control has now reached the limits of current air gauge capability.

The Single Pass process uses a combination of superabrasive-plated tools, preset to exact dimensions, which are passed through the bore, rotating as they complete the honing operation. The number of tools required for any specific task depends on: the amount of material to be removed, the surface finish required and the specified final geometry: roundness, concentricity, bow and/or size.

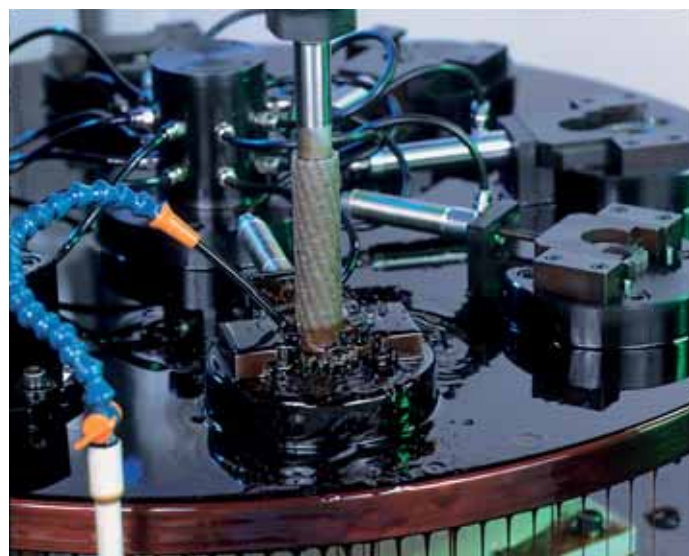
It is this preset tool sizing, combined with the slower wear of the superabrasives, that enables the Single Pass process to achieve the tightest bore size requirements with excellent statistical process control. In order to achieve the best bore precision it is essential that the cutting tools follow the centerline of the existing bore with the least possible force and this is achieved by allowing either the component or the tooling to float. In situations where the part length is greater than three times the diameter of the bore, both axial and radial float are necessary.

In the case of this particular steering housing, it was determined best to hold the part rigid and float the tooling, so spring-loaded holders provided the radial float for the tool assemblies, together with a special, free-pivoting union which was incorporated inside the mandrel of the tool. In this instance, up to 0.038 mm of ductile iron needed to be removed and, as the bore had limited clearance at the bottom, a semi-blind bore finishing tool design was needed.

The tooling progression consisted of a series of six tools ranging from 40/50 down to 200/230 mesh diamond. The process tolerance needed to be held within a total range of 0.7 μ m, including variation in bore shape and overall gauge accuracy and repeatability.

Using the Single Pass process, tool size can be maintained for relatively long periods of time, but it is important not only to monitor and control the size of the final finishing tool, but also of each tool in the progression. In addition, in order to achieve the required bore precision, each phase of the process must be correct, including the tooling, fixturing, floating mechanisms and gauge systems.

Today, many automotive sub-assemblies require increasingly tight clearances between mating components; the Single Pass Bore Finishing system helps make these requirements a reality.



Boxout Information Tables

Steering Housing

Material: Ductile Iron
Bore Size: 42.164 mm
Type: Semi-Blind
Length: 96 mm

Tooling Progression Diameter

Station 1: 42.130 mm
Station 2: 42.147 mm
Station 3: 42.157 mm
Station 4: 42.161 mm
Station 5: 42.163 mm
Station 6: 42.164 mm

Grit Size

40/50
40/50
40/50
60/80
100/120
200/230

Bore Quality Required

Size: +/- 0.0013 mm
Roundness: 0.0013 mm
Straightness: 0.0013 mm
Surface Finish: 0.5 Ra

Achieved

0.0007 mm (1.67 Cpk)
0.0003 mm
0.0007 mm
0.25 Ra

Engis UK

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www.engis.com



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. Sunnen 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.

To find out about the latest technology in bore sizing and finishing, visit Sunnen.com or contact your local Sunnen representative.

**For more information contact
Sunnen Products Limited
at +44 1442 393939 or visit www.sunnen.co.uk**


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Partnership · Precision · Performance

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Sunnen and ANS collaborate on friction and wear reduction technology

Sunnen Product Company and Applied Nano Surfaces (ANS) develop new program focused on the ANS Triboconditioning process that reduces friction and wear on a variety of honed parts and components

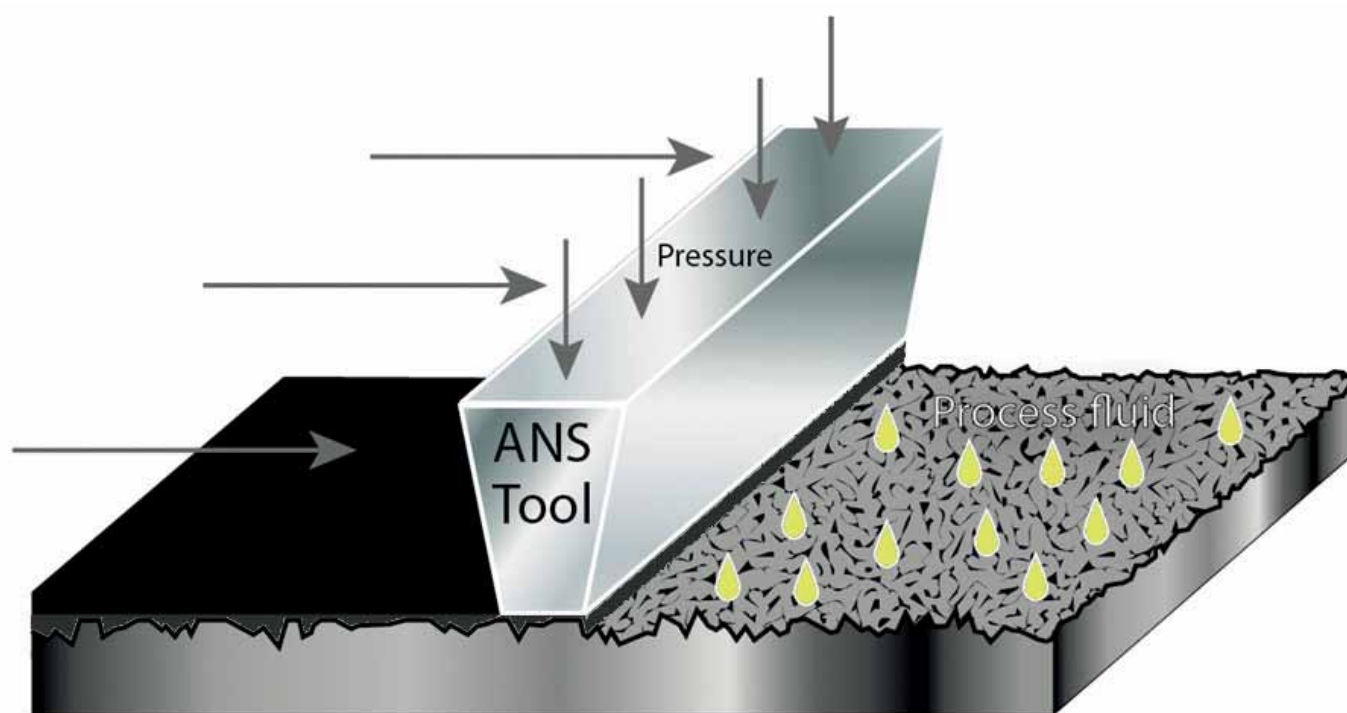
Sunnen Products Company and Sweden's Applied Nano Surfaces (ANS) have entered into a joint market development agreement to advance technology and applications based on the unique Triboconditioning® process recently patented by ANS. The process reduces friction and wear on various steel and cast-iron surfaces while improving

surface finish, preventing seizures, and enhancing product life.

"ANS is on the leading edge of friction reduction technology," says Chris Miltenberger, president and CEO of Sunnen Products Company. "We are excited about working with ANS on the development of new products and surface finishing methods

which will bring unique solutions to all segments of the manufacturing industry.

Triboconditioning is a combined mechano-chemical surface treatment process which uses a machining procedure to level off surface peaks and apply a friction- and wear-reducing compound to the component surface. Unlike spray



Triboconditioning is a combined mechano-chemical surface treatment process which uses a machining procedure to level off surface peaks and apply a friction- and wear-reducing compound to the component surface. The process is very cost-efficient in mass production environments, making it perfect for in-house manufacturing as a part of component manufacturers' production lines

The **Science** behind

Lapping, Polishing, Grinding and Honing

Engis

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



coatings, the compound becomes an integrated part of the component structure at a nano level. The process is mechanically simple and, in most cases, can be done with Sunnen precision honing equipment. It is very cost-efficient in mass production environments, making it perfect for in-house manufacturing as a part of component manufacturers' production lines.

Key applications include automotive engine components such as valve train parts, cylinder liners, crankshafts and connecting rods, as well as industrial applications such as hydraulic motors, rock drills, pumps, chains, gears and compressors.

"ANS is looking forward to combining our knowledge of friction reducing technology with Sunnen's expertise in surface finishing," says Christian Kolar, CEO, Applied Nano Surfaces Sweden AB.

"The solutions under development have the potential to be a real game-changer in component efficiency and product lifetime."

Headquartered in Uppsala, Sweden, ANS offers unique surface treatment technologies on a broad range of industrial and automotive applications.

Sunnen is a worldwide leader in the manufacture of precision bore creation and finishing equipment with headquarters in St. Louis, Missouri and manufacturing and technical support facilities in Europe, China, India and Brazil.

For additional information contact:

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Email: hemel@sunnen.co.uk
www.sunnen.com



Sunnen and Applied Nano Surfaces have entered into a joint market development agreement to advance technology and applications based on the patented Triboconditioning process. The process uses a Sunnen SV-2115 vertical hone to reduce friction and wear on various steel and cast iron surfaces while improving surface finish, preventing seizures, and enhancing product life

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Subcon Drilling Limited is a highly professional company whose entire experience and energy is focused solely on Gun Drilling, Deep Hole Drilling, Honing, CNC Machining and Superfinishing.

With the knowledge and extensive experience of over 30 years, **Subcon Drilling** continually provides a professional and personal approach with total dedication to quality to a list of long serving clients.

Our BS EN ISO9001:2015 Quality Management System is an integral part of our business. Focused on quality, Subcon Drilling is recognised as the leading Gun drilling and specialist machining provider in the U.K., continually meeting and exceeding our customer's demands.

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New chapter at Ellesco promises new focus and growth

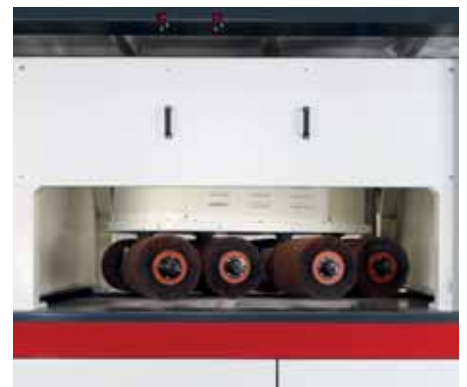
After 40 plus years under the stewardship of the Simonis family, Christchurch-based metal finishing specialist, Ellesco, is now under new ownership, with Guy Newton returning to the business after taking a controlling interest from Vincent Simonis and his family.

This new chapter in this long-established, market leader, will inject a combination of fresh capital and enthusiasm to the business and comes with plans to double machine sales within 2-3 years, which Guy is confident of achieving. This ambitious sales growth will be supported by a raft of new approach to financing of machines and customer support. The innovative approach will see greater flexibility for customers in terms of staged payments, extended warranties and service, among many other developments, such as offering best practice pricing to facilitate the use of old machines in part exchange for new ones.

"I am grateful to have the opportunity to progress Ellesco into its next chapter after over 40 years of success under both Leonard and Vincent Simonis. Returning to a known business, one with a long history and large customer base, has been an opportunity I embrace with enthusiasm. Ellesco will be reinvigorated with the new investment and plans for quicker lead-times through higher stock are already in hand.



Guy Newton's return to Ellesco as its new owner signals a new chapter for the business, with ambitious plans already taking shape



"With over 2,000 operational machines in the UK and our own team of manufacturer trained service engineers, we are looking to enhance our service offer through more flexible packages, delivering greater value to the customers. In addition, service packages can be managed to provide extended warranties on new machines.

"I am grateful for the support of Timesavers and other long-term suppliers and look forward to our experienced team delivering improvements for the customers and, of course, seeing everyone again at MACH 2022."

Of course, while some things change, others remain the same with the core of Ellesco's business concentrated on the Timesavers/Grindingmasters range of deburring and surface finishing machines.

Here, the number of machines in stock and available for live or virtual demonstrations will be increased. Ellesco will also be developing a range of service packages that can be tailored to suit individual customers ranging from a general once a year service to multiple service visits and discount structures on consumable supplies and extended warranties.

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Kemet introduces Xebec PATH™ to beautiful deburring

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

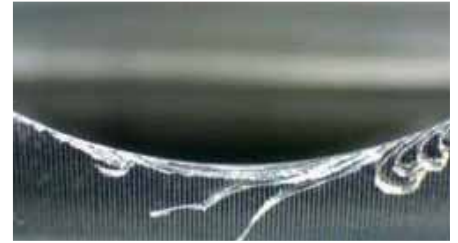
Kemet is always monitoring technical developments around the world and is delighted to be able to offer a comprehensive deburring solution in the full range of Xebec deburring and polishing products. The range includes tools for a range of applications for deburring after face-milling, end milling and drilling; threading and drilling, as well as polishing brushes to remove cutter marks on top surfaces, side, inner diameters and channels.

In addition to the ceramic brushes is a range of back burr cutters, specifically for deburring front and back of drilled or tapped holes. These are supplied with a

custom programmed tool PATH™, so there is no additional programming needed by the user. Coordinates are supplied along with the tools for your specific application. Thanks to PATH™, the cutter cuts into a 3D curved edge with the optimal cutting angle ensuring no secondary burrs are generated. The tool life is dramatically extended by continuously shifting the contact point of the cutting edge. In tests these tools have been proven to cut machining times by up to 90 percent.

Made from micro-grain cemented carbide, the cutters are sharp and long lasting, with a highly heat resistant AlTiCrN coating suitable for machining a wide range of materials from non-ferrous, for example aluminium and brass, to more difficult materials such as titanium and Inconel. The helical blade provides a cleaner cutting edge and prevents secondary burrs.

The combination of the spherical deburring cutter and the custom-made tool PATH™ enables hole deburring on a 3D curved edge using a CNC machine. High-speed and excellent quality deburring



is achieved while maximising the tool life. The tool path data can be used as soon as it has been installed on a CNC program, saving the time needed to develop the program.

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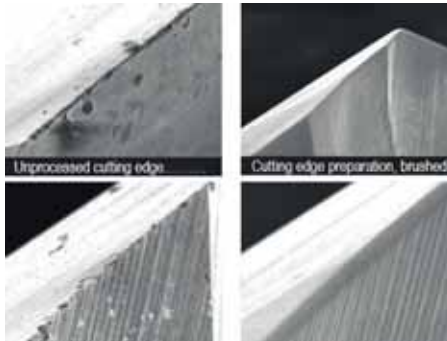
Deburring in the medical industry

Focusing on perfectly deburred bone plates at Medartis AG

As a global innovative manufacturing leader in medical implants, Medartis AG drives technologies and solutions for osteosynthesis and purchased their first Gerber brush polishing machine for deburring titanium parts back in 2008.

Additional Gerber brush polishing machines are now in use at Medartis AG, located in Basel in Switzerland and the group manager for Process Engineering at Medartis, Peter Scheuble, is very pleased indeed with their performance. When Medartis was looking for an economic method for rounding edges and deburring parts for their project, it became aware of the Gerber Company at a trade fair and, after seeing the Gerber BP-MX deburring machine, quickly focused on carrying out trials to engineer a solution together.

The BP-MX brush polishing machine brushes away sharp edges and burrs and creates precisely defined radii or contours on edges with high accuracy, at the same time polishing the surface. This technology



is often employed in the machining of cutting tool inserts where different but fully defined radii are required from one insert type to the next. After the successful subsequent tests carried out by René Gerber AG, the machine was specified and modified according to the needs of Medartis.

As Peter Scheuble emphasises, his wishes and needs were dealt with in a highly competent and individual way and Medartis is very satisfied with the machines and the service support from Gerber. The purchase of the BP-MX machine for the double-sided controlled deburring of titanium blanks eliminated the previous laborious manual de-burring process and the employees were able to be deployed elsewhere within the business for other relevant work steps. Medartis saw several benefits from the investment they made in the Gerber machines and, apart from the labour saving, the parts are now better defined, have a regular improved quality and the process is both easy and automated.

Due to its high toughness, parts made from titanium place high demands on the machines when machining the parts and defining the process is important. The residue-free deburring result was achieved in a gratifyingly short cycle time. All burrs left over from the previous milling operations were completely removed down to the root of the burr using the Gerber BP-MX brushing machine. This gave Medartis a perfectly deburred bone plate which is then ready for further process steps. The desired deburring result and process reliability is guaranteed by regular, fully automatic measurement and tracking of the bristle length as the brushes wear. By changing parameters such as the brush

material, brush density, brush speed, table speed, working pressure, operating time and the polishing agent it is possible to create different contours, shapes and surface roughness as is desired to arrive at the perfectly deburred and polished component.

Peter Scheuble states that the Gerber machine satisfies Medartis in several additional ways. The floor space of the entire installation is so small that it was optimally integrated into the available working area and thus lean measures can be implemented in a targeted manner. The simplicity of operation and software is very impressive and operators can activate another processing program or make adjustments with just a few basic input commands. Loading the BP-MX is at an optimum working height and can be carried easily and the integrated SPS control is user-friendly and leaves nothing to be desired.

For Peter Scheuble, the high efficiency and the uniformity of the deburring result are the outstanding features and comments that the Gerber deburring machine is the ideal product for the company and Gerber a matching competent partner.

Apart from medical parts, another main application for the Gerber machines is the edge preparation, deburring and polishing of all types of cutting tool inserts and Gerber can list worldwide industry leading clients such as Plansee-Tizit, Sandvik, P.Horn, Sumitomo, Iscar, and Kennametal amongst its many end users.

Gerber's focus is on the generation and subsequent polishing of radii, chamfers and recesses on components made from ultra-hard materials and they have, following years of cooperation with leading insert manufacturing companies, designed special purpose machines for the manufacture of



indexable cutting tool inserts. Inserts are brushed on a planetary table with the rotary motions of the table, workpiece carriers and brush producing an equal and highly controlled radius on the edges of cutting tool inserts. Through the use of various types of brush combined with variable machine parameters it is possible to produce various contours and shapes on insert edges including the full radius, waterfall and flat forms that are used throughout the insert manufacturing industry. This controlled erosion process is



carried out using loaded abrasive nylon brushes for standard type inserts and brushes made of natural bristles coated with diamond paste for inserts with special forms, those that require coating, or those that have chip-breaker grooves. Tungsten carbide, ceramic, CBN and PCD inserts can all be machined.

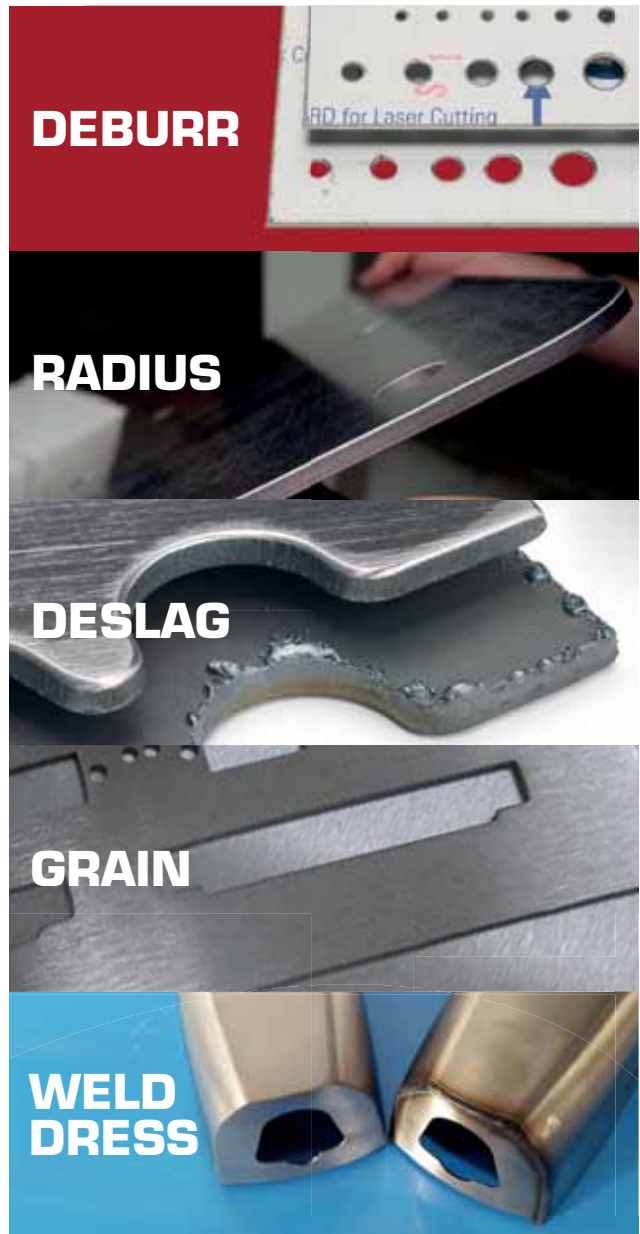
A wide variety of Gerber machines is offered from fully automated ones capable of processing over 1,500 cutting tool inserts per hour to simple cost effective "bench top" models that despite their low cost and size can still produce 250 or more inserts per hour. The higher output automatic machines may be specified with systems that automatically monitor and then compensate for, brush wear.

The machines are fitted with brushes from 300 mm to 420 mm in diameter with a capacity of up to eight carrier plates. Each carrier is loaded with a cage that holds the inserts during the machining process. The cages are easily and quickly manually loaded, while all machines are highly versatile and offer very fast changeovers of a matter of just a few minutes. Furthermore, the larger machines within the range, being equipped with touch screen Siemens PLC controls, are able to store and recall all operating programmes for even easier and faster setups.

Apart from insert production, Gerber machines are also used for the manufacture of valve plates, pump components and rotors etc., whereby parts need to be deburred with edge forms being controlled.

All Gerber brochures are available on UK distributor Advanced Grinding Solutions Ltd's website.

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Danish tool manufacturer puts its trust in VOLLMER

Danish tool manufacturer, TN Værktøjslibning has a name that may be a bit of a mouthful, so it often shortens it to TN Slib. The word "Værktøjslibning" means "tool grinding" and that is exactly what the company does. It produces coated, solid carbide milling cutters and drill bits, which can be made to order or can be chosen from more than 50 standard models. The Bjæverskov based company also offers resharpening services and advice.

At the beginning of 2020, TN Slib decided to purchase the VGrind 340S tool-grinding machine, which Biberach-based sharpening specialists VOLLMER introduced to the market a year earlier. The VGrind 340S is a newer iteration of the time-tested yet highly innovative machine concept on which the VGrind series is based.

TN Værktøjslibning (TN Slib) is one of Denmark's leading tool manufacturers located approximately 50 km south-west of Copenhagen. Among the central tenets of the company's vision are high product quality and a focus on customer relations that are founded on mutual trust and cooperation. The company employs 25 members of staff that work to produce, coat and resharpen solid carbide tools such as milling cutters and drill bits. TN Slib specialises in developing bespoke stepped milling and drilling tools in close collaboration with its customers. Currently, its customers hail primarily from Europe, but it is attracting ever-increasing interest from businesses from further afield. To increase the quality and precision of its cutting tools, the manufacturer invested in the VOLLMER VGrind 340S grinding machine at the start of the year.

TN Slib makes around three-quarters of its sales in the production of bespoke, solid carbide tools. The company also offers standard tools for cutting metals such as steel, aluminium, cast iron or copper. TN Slib's customers are chiefly in the medical technology, aerospace and automotive industries. To improve the performance and operating life of its tools, TN Slib coats them using two dedicated coating machines. A new CNC milling centre was procured specifically to test different coatings. Around 5 percent of the company's sales come from its resharpening services.

Using the VGrind 340S grinding machine, TN Slib seeks to drive forward the



development and production of small milling cutters and somewhat larger drill bits with diameters of between 0.3 and 8 mm. Delicate tools like these are facing increased demand in the manufacturing industry because of the ever-tighter spaces encountered in mobile devices, medical equipment and automotive technology. VOLLMER designed the VGrind 340S especially for machining small solid carbide cutting tools. With its two vertical spindles for different grinding wheelsets, the grinding machine allows for multi-level machining. This enables TN Slib to cut down on non-productive time and further improve tool quality. Five optimally configured CNC axes achieve interpolation with short travel distances for the linear and rotational axes,

which in turn reduces the time required to machine workpieces and allows for incredibly tight tool tolerances.

A key factor in TN Slib's decision to purchase the VGrind 340S was that the machine has the versatility to produce both small and large batches. The proven NUMROTOplus software enables three-dimensional simulation of production processes and makes it possible to carry out collision monitoring in advance. To allow the company to operate the grinding machine around the clock, tool manufacturer TN Slib opted for an optional automation solution. This came in the form of the HP 160 pallet magazine, which allows up to 900 workpieces to be fed-in for unmanned machining of tools with different shank diameters.

"Medium-sized tool manufacturers like TN Værktøjslibning are increasingly using machine tools that are tailored to their specific requirements," says Jürgen Hauger, CEO of the VOLLMER Group. "The basic concept behind our VGrind product family enables us to configure sharpening machines on a modular basis and optionally adapt them to processes that are desirable for tool machining, especially for custom toolmaking."

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ANCA's new era of automation

Intelligent solutions for maximising productivity 24/7

ANCA Integrated Manufacturing System (AIMS) uses smart automation and IT integration to connect tool production processes and systems.

ANCA's launch of integrated solutions with AIMS, connects sequential processes in tool manufacturing, to bank the benefits of automation and integration. AIMS facilitates streamlined tool production, linking separate processes to each other and factory IT systems. The future of toolmaking is here, with AIMS providing versatile, modular options for common manufacturing challenges to optimise cutting tool production.

AIMS offers functionality that is adaptable to each factory's needs, from smaller scale, data-based options to the full AIMS setup across a series of machines with endless possibilities. Central to any AIMS system is the AIMS Server that manages data flows between the elements of the AIMS system and established IT platforms, such as your ERP system. Building on this, customers can choose from a suite of "auto" solutions for reducing production costs, resolving labour challenges and integrating systems to improve product and process quality. From transferring tools between operations with AutoFetch robot options, fully automated tool measurement and process compensation using AutoComp and managing data via the AutoSet hub, AIMS delivers streamlined manufacturing, with



connected tool production processes integrated to IT systems that takes tool production to the next level.

"ANCA is here to provide tool manufacturers with solutions to support production that work across all industries and applications and expand to complete tool production needs. This is a new landscape for interconnected technology, working end to end," says Chris Hegarty, ANCA Group CEO.

"Integration and automation solutions provide infrastructure to manufacture tools with increased productivity and higher quality. ANCA has the industry-leading software and control capabilities to deliver a

system for production management that tackles time, cost and labour inefficiencies where it counts.

"We are delighted to be accelerating into the fourth industrial revolution with advanced, smart factory solutions for cutting tool makers, intelligent automation for connecting processes and data management."

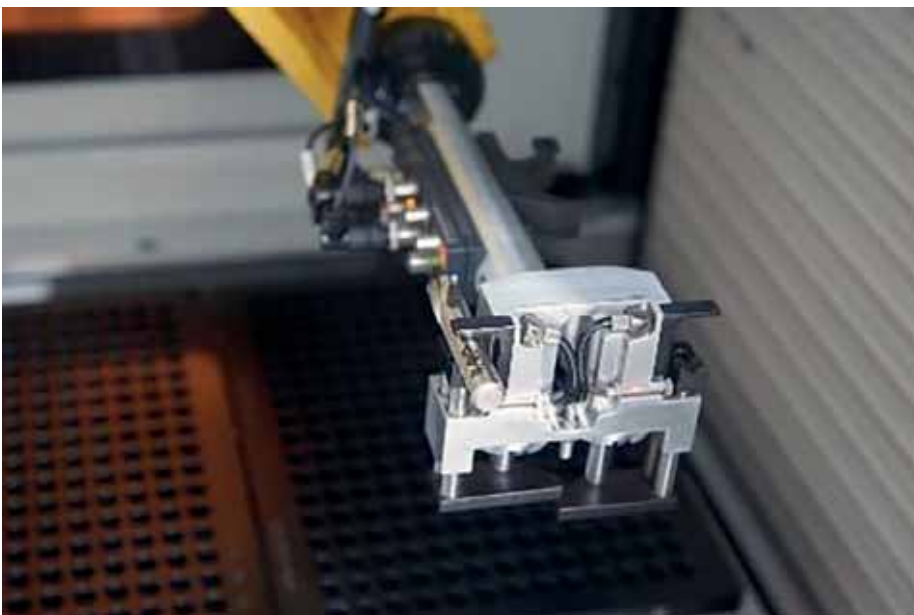
Connect, automate and create with AIMS

AIMS project lead, Duncan Thompson says: "Automated options that can be applied in the real world and tailored to a machine shop's challenges mean that tool manufacturers can reap the advantages of integrated processes and systems in a practical way."

Over 70 percent of ANCA customers seek machines with robotic functionality. ANCA's world-first technology developments utilise automation to gain efficiencies and have helped reduce production costs by 50 percent.

Duncan Thompson explains: "Our customers continue to look for custom solutions for increased automation in their operations and AIMS is ANCA's holistic response; a tangible option for a smarter factory. Automation that works best is targeted to repetitive processes that can occur alongside value-adding individual skills. AIMS slots in to seamlessly automate routine processes.

"Seeing this level of integration in action is pretty amazing. Our easy-to-view, virtual



demonstration really highlights the ways that AIMS works to boost tool production. AIMS can be deployed to a single process or across an entire production line, towards end to end tool manufacturing.”

The AIMS online demo exhibits interconnected grinding technology solutions that eliminate wasteful manual handling, reduce machine downtime in between batches and take away the need to have operators constantly monitoring and adjusting production machines.

For complete tool production, AutoMark X offers automated laser tool marking

The new AutoMark X is ANCA's tool marking solution designed particularly for the needs of cutting tool production. ANCA already has you covered with critical tool grinding processes, i.e. CPX for blank preparation, and tool grinding on ANCA's TX, MX and FX tool and cutter grinders. AutoMark X will work seamlessly alongside ANCA CNC grinders and automates the tool marking process, further extending unmanned production operations.

Tool manufacturers are seizing options that streamline processes and save labour

costs. AutoMark X is capable of automated pallet loading and takes care of the tool laser marking process, freeing up operators to perform more value-adding tasks. AutoMark X is designed for integration with AIMS, being able to automatically receive and dispatch pallets from AutoFetch, while connectivity to the AIMS Server provides details of the message to be marked on the tools.

Product manager, Jan Irzyk said: “This machine is efficient and compact but, more than that, it can be integrated with your ERP and AIMS, so that technology can work together. Removing the need for manual handling, our new laser marking solution pushes tool marking capabilities into lights-out production.

“For full production, flexibility is important. This system accommodates a variety of tool sizes as well as mixed batches. With an easy to use interface and customisable marking, it is a complete solution that boosts labour efficiency.”

With over 45 years' experience delivering CNC grinders to customers around the world, ANCA carries a reputation for delivering customer-focused innovations



that meet market needs. Products that use smart automation for every day applications offer increased productivity and profitability. Integrated manufacturing, and machines that work together for complete tool production provide comprehensive options for manufacturers across multiple industries.

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Energy saving Walter Helitronics are good for owners and for the environment

Walter Ewag UK, a member of the United Grinding Group, reports that energy savings of up to 40 percent can be achieved through optimised operation of its Walter Helitronic tool grinding and erosion machines by, for instance, sensible warm-up and shutdown programs, the recovery of thermal energy and optimised machining via machine control software routines.

This figure also includes an 11 percent reduction in the machines' energy consumption because Walter now uses more environmentally-friendly components in machine build compared to those widely available 15 years ago.

All measures and claims are independently assessed by experts from the German Steinbeis Sustainable Energy Competence Center.

Walter's awareness of climate protection begins with the design and construction of its machines, for example, by utilising modern drives and improved part loading, compressed air and extraction, as well as by the use of energy-saving LED lights and frequency-controlled coolant pumps. This also continues through production by optimised machine operation. Some of the technology improvements made include:

Feed and spindle drives - the use of highly efficient synchronous motors and regenerative braking energy feedback into the power grid, including linear motors in the vertical axis on certain models and passive weight compensation.

Coolant supply via frequency-controlled pump: high efficiency motors (efficiency



class IE4) and up to six individually switchable coolant valves optimise coolant supply.

LED lights are used in all machines, including the status light.

Central lubrication – 'impulse' lubrication means, for example, that the lubricating oil pump runs only for a few seconds until lubricating pressure is built up. The pump is then switched off until the next lubrication cycle.

Each machine's vapour separator is equipped with potentiometer control and a free-running fan wheel, which allows optimal adjustment of the extraction volume. The EC motors are IE4 rated.

In addition, says Walter Ewag UK, machine users can adopt various routines to gain further improvements in energy efficiency, including:

Off-work switching – each Walter machine has an 'off-hours' switch so if the machine remains switched on beyond the end of the

shift, a standby mode if effected after the last tool has been processed. In such mode the coolant pumps, extraction system, hydraulics and grinding spindles are set to 'off' and the axes drives are set to pulse lock.

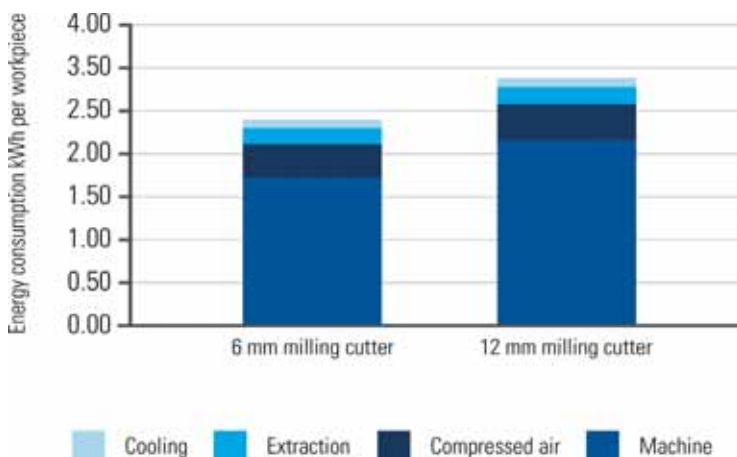
The machine warm-up program can be automatically started at a selected date and time. The machine remains in stand-by mode and, one hour before the start of work, it starts to warm up so it is at operating temperature and can go into production immediately when the operator arrives.

During work breaks or in the case of any 'inactivity', a number of units are switched off, i.e. vapour extraction, coolant pumps and sealing air.

Machines with linear and torque motors have a central supply and return of the motor cooling medium, and customers have the option of using the waste heat generated for heating buildings.

Machining process simulation – with the Helitronic Tool Studio software or Cybergrinding, tools can be simulated in advance on an external PC workstation to save valuable working time while also reducing the test operation and test parts.

Savings with up-to-date Walter Helitronics: average savings per workpiece are 0.34 kWh per year, based on 3,500 operating hours and producing a mix of 6 mm and 12 mm milling cutters.



Walter Ewag UK Ltd

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Floyd's new quick change tool grinding clamping system

Whilst widely known as 'the sliding head tooling experts', Floyd Automatic Tooling is also introducing new tool clamping technologies from Swiss manufacturer Schaublin that will emphasise why the company offers so much more than tooling for the precision component machining industry. To cater for manufacturers of cylindrical cutting tools, Floyd Automatic can offer the quality and diversity of the Schaublin range of products and, in particular, the exciting SRS range of collet clamping heads with its unique precision runout adjustment system that give repeatability within 2 µm. Floyd offers the flexibility of the Schaublin SRS system for grinding machines using W or B type draw type collets. The SRS system is an exciting prospect capable of enhancing the capability for tool grinding shops.

Floyd also offers the patent pending PR25 quick change collet system. Perfect for clamping drills, end mills, reamers and other cutting tools, the quick change PR25 is perfect for cutting tool manufacturers in a production environment where a lot of collet changeovers are required. With no

'on-machine' changes necessary, minimal run-out, low-wear characteristics and minimal dispersion of the run-out, this high-quality solution is a 'must-have' for grinding shops and cutting tool manufacturers. These new clamping solutions are supported by Floyd with the complete range of Schaublin precision W, and B type collets available in the famous 'orange box'.

Complementing the SRS and PR25 quick change heads, the Schaublin series of HSK A, HSK C and HSK E tool holders are high-quality and ultra-precise. The Schaublin HSK series has been developed to ensure optimal toolholding precision when working on high-speed machining and grinding centres, transfer machines and other high-end machine tools that demand the utmost in precision with high clamping forces.

In addition, Floyd Automatic also offers a diverse range of quick release clamping heads for axial draw-back collet chucks. The serrated clamping heads offer easy set-up with high rigidity levels and impressive clamping forces. For more sensitive



components, precision polished clamping heads are also available for perfectly precise workpiece clamping on conventional and CNC turning centres.

If you want to get a firm grip on your productivity and quality when clamping components on manual and CNC turning and cylindrical grinding centres, Floyd Automatic Tooling also has a complete range of solutions.

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Radiusing of tooling components with drag finishing technology

Tenfold increase of tooling uptimes and improved process stability

To date, voestalpine Rotec GmbH, a global leader in the manufacture of precision steel pipes and tubes, has been using a manual process to place a radius on its stamping tools. Within the framework of its continuous process optimisation program the company replaced this manual operation with an automated Rösler drag finishing system R 4/700 SF. With the single piece dry drag finishing process the usable life of the stamping tools can be at least doubled. For some tools the uptime can even be increased by a factor of ten. For this reason, the return on investment period (ROI) is well below two years.

With eleven manufacturing locations in Europe, North America and Asia, voestalpine Rotec is a globally operating company that is specialised in the manufacture, refinement and marketing of precision steel pipes and tubes. Since the company belongs to the internationally operating steel and technology corporation voestalpine, the customers have direct access to comprehensive knowhow ranging from steel liquification to the complete pipes and tubes. The development of innovative products and manufacturing technologies takes place in four divisions.

Within the corporate structure, voestalpine Rotec, headquartered in Krieglach, Austria, belongs to the metal forming division. At this location the company manufactures primarily belt tensioning tubes for the automobile industry. The complex manufacturing equipment for making pipe and tube components is also designed and built at the same location. Hannes Winkler, assistant to the plant manager at voestalpine Rotec and responsible for process optimisation, explains: "To be able to make our products at internationally competitive costs, our company is utilising continuous improvement processes."

Cost reduction by increasing the usable life of tooling

Even before wear became visible, stamping tools like arbors and die plates had to be replaced because of minor fracturing at the



The compact, universally usable drag finisher R 4/700 SF is equipped with a carousel with four rotating spindles. Each spindle holds three workpieces. Separate rotary drives of carousel and spindles allow the individual, entirely independent adjustment of their rotary speeds. For the ergonomic, simple and quick loading of the spindles the carousel can be moved to the load/unload station by the push of a button

edges. Frequently the edges were reworked by hand, but this did seldom extend the usable life of the tools. With around 50 million manufactured components per year, tooling supply was a significant cost factor. Therefore, it was not surprising that the process optimisation specialist was looking for an automated, repeatable edge radiusing process for prolonging the service life of the tooling.

Cost-efficient dry processing in a drag finisher

Edge radiusing of the tools is an ideal application for the drag finishing technology. This unique mass finishing system allows the precise, targeted surface finishing of high-value, complex workpieces. Exactly defined process parameters guarantee absolutely repeatable finishing results.

"From my previous occupation at a supplier of motor sport components I knew that Rösler Oberflächentechnik builds such equipment. That is why I contacted Rösler first. Of course, we also contacted other suppliers of mass finishing equipment and asked them to run processing trials for us," continues Hannes Winkler. In the end the customer chose the R 4/700 SF system, because Rösler was the only supplier, who could offer a dry finishing process for the tools. He adds: "The dry solution eliminated the process water cleaning system required with the wet processing solution. This reduced not only the capital expenditure but also resulted in lower operating costs. Of course, the quality and long service life as well as the high availability of the Rösler equipment also played an important role in our decision."

Automated finishing that is perfectly adapted to different tools

At the heart of the compact, plug-and-play drag finisher is a carousel equipped with four rotary spindles, each spindle allowing the mounting of three workpieces. The carousel and the rotary spindles are outfitted with separate drive motors allowing the setting of totally different rotary speeds for carousel and spindles. The processing bowl is filled with processing media, which in this particular application consists of crushed walnut shells and aluminum oxide. A vibratory motor mounted below the processing bowl ensures the optimum mixing of the processing media. Required bowl changes can be quickly carried out with a forklift truck.

For the actual process the tools to be finished are manually mounted to specially designed workpiece fixtures, which in turn are attached to the spindles equipped with quick-connect couplings. To facilitate this operation, the operator moves the spindles to the load/unload station with the touch of a button. This allows quick, ergonomic and simple loading/unloading of the workpieces.

Once the respective processing program,

stored in the programmable system controls, has started, the carousel with the spindles is lowered so that the rotating spindles are immersed in the processing media. Carousel and spindles are moving clock and counterclockwise at the defined rotary speeds. At the midpoint of the processing cycle, depending on the tools to be finished, the total finishing time varies between 15 and 45 minutes and the rotary direction is usually changed. This guarantees an even radiusing of the tool edges on all sides.

Continuously growing workpiece spectrum shortens the amortisation period. Initially it was planned to use the drag finisher for five frequently used tool types. Hannes Winkler reports: "The new mechanical drag finishing system produced such good results that the usable life of these components could be practically doubled and in some instances even increased by a factor of ten.

"Since commissioning the drag finisher about six months ago, we have increased the spectrum of work pieces to be finished mechanically to around 20 different tool types. This helped reduce the amortisation

period to well below two years. By continuously adding additional workpieces, the amortisation time will decline even further."

This positive experience led the voestalpine group of companies to list Rösler as the exclusive supplier for this particular finishing application.

Besides the mechanical edge radiusing of additional tool types, the process optimisation specialist is also considering a polishing application. Hannes Winkler concludes: "At the moment we are conducting processing trials. If the results are as we expect, we will purchase a second processing bowl with the required processing media. A key advantage of the Rösler drag finisher is that processing bowls can be easily exchanged allowing us to quickly switch from one application to another."

Rösler UK
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The processing bowl of the plug-and-play drag finisher can be easily exchanged with a fork lift truck. This allows quickly switching from one application to another without having to replace the processing media



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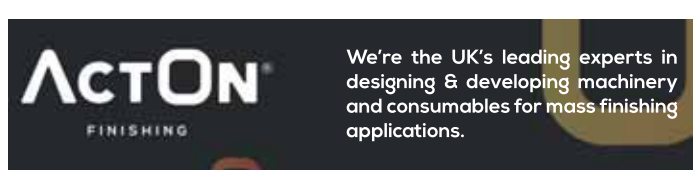
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Achieve a mirror polished finish on medical implants and instruments in one step

ActOn Finishing is expanding its surface finishing services for the healthcare industry by offering dry electropolishing systems: a cost-effective and time saving solution for mirror polishing medical implants and instruments.

In a demanding sector like healthcare, the dry electropolishing process is key to achieving the surface finish required for implants and medical instruments. The DLyte system has been designed to meet the safety regulations imposed by the industry and has proven the biocompatibility of the products processed with this system.

DLyte electropolishing vs mechanical surface finishing

In a mechanical surface finishing process, parts would go through different steps to be deburred, surface roughness to be improved and mirror polished. The process



would also require different medias and compounds and in some instances, different machines in order to achieve the final result. Moreover, liquid electropolishing can reduce the surface roughness of a non-electropolished surface by only 50 percent.

DLyte, on the other hand, is a fully automated dry electropolishing system which will enable you to mirror polish medical implants and instruments in just one step. Here a few more reasons why you should consider dry electropolishing to surface finish medical implants and instruments:

- Implant's initial shape is not affected during the process
- DLyte uses a non-abrasive surface finishing process, which reduces the roughness while maintaining the part's geometry and respecting tolerances.
- The parts' resistance to corrosion is significantly improved



The life span of Implants and medical instruments is influenced by corrosion. In a liquid electropolishing process, parts need to go through a surface treatment, after the polishing process, to comply with the corrosion resistance requirements of the medical device industry. In comparison, DLyte is able to improve the surface roughness, improve corrosion resistance and mirror polish the components in a shorter time.

Proved biocompatibility

As previously stated, the healthcare industry requires clinically proven processes and products which guarantee their compliance with the most demanding safety regulations. Based on studies* conducted with the DLyte system, the dry electropolishing process meets the acceptance criteria:

- The viability has been superior than 70 percent in all concentrations tested compared to the blank control.
- The extract at percent of the test sample has shown greater or equal viability than the extract at 100 percent.
- The mean value of blanks has not differed by more than 15 percent of the average value of all blanks.
- Study conducted by GPAINNOVA, based on the standard specifications UNE-EN-ISO 10993-5:2009.

Dry electropolishing is perfect for fragile medical implants and instruments

During the surface finishing process, fragile components, such as needles and stents, can be damaged by the mechanical energy on an aggressive process. Nonetheless, DLyte has a more controllable process and works better at micro and macroscopic level.



Labour costs and material costs will be significantly reduced when you switch from a multi-step process to a one step process. Moreover, as the process is repeatable, you don't have to carry out any rework on parts. Here's an example of how much you can potentially save when you choose the DLyte system (based on surface finishing 500 knee implants/day):

A knee implant would go through several mechanical surface finishing steps after the manufacturing process, to be in compliance with the healthcare industry regulations. These generally include machining of the box with CNC grinding machine, to achieve a specific shape, grinding using different grinding belts, polishing and manual buffing.

ActOn Finishing can achieve the final mirror polish finish in a one-step dry process, where no water recycling is required. The implant is clamped in a specific designed holder, which is dragged in a circular motion through a process drum, which contains Dry electrolyte media. In this process the part is deburred, smoothed and mirror finished in the shortest time and a cost-effective way.

Process results are:

- Surface roughness of < 0.02 sq m.
- Based on tests carried on additive fatigue of Ti6Al4V implants, DLyte reduces over 45 percent of roughness in the first hour of process and 70 percent after five hours.
- No grinding lines or patterns on the implant's surface.
- Process time is significantly reduced by between 15 to 60 minutes, depending on part's initial conditions.
- Part's resistance to corrosion is improved.

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Blast cabinet for selective conformal coating removal

Guyson International, the UK's foremost industrial finishing equipment manufacturer, has recently installed a specialised version of its Formula 1400 blast cabinet into an aeronautical defence manufacturer, for the selective removal of conformal coating from printed circuit boards (PCBs).

If during testing or usage a circuit board develops or registers a fault then instead of scrapping the entire board, which could incur very considerable costs, selective conformal coating removal is undertaken so that the damaged components can be replaced or reworking such as resoldering can be undertaken.

This specialist Formula ESD version is based on the well-proven Guyson Formula 1400 blast cabinet, which has been specifically adapted for this application and comes complete with a Guyson 21 twin bag dust collector. Blasting is undertaken with the stand-alone pressure fed Pencil Blast unit which is fitted onto an external shelf on the left-hand side of the cabinet. This unit is provided with a micro nozzle that propels the blast media, from the single blast pot, to

selectively remove the conformal coating. Choice of blast media depends on the type of conformal coating and options include walnut shells, sodium bicarbonate, plastic and wheat starch.

All blasting operations generate some level of static electricity and if this potential is not conducted away an electrostatic discharge (spark) can occur. Hence this Guyson Formula ESD version comes well equipped with preventative measures to enable safe blasting.

ESD specific features on the cabinet include an ionising air curtain fixed to the inside back wall of the cabinet, this provides a high-speed laminar sheet of ionised air which washes down over the components and floods the chamber with ionised air for static neutralisation. An ergonomically designed handheld air-assisted ionising gun, for localised use, neutralises static charges and removes dust contamination on the individual boards. Additionally, extensive earth-grounding straps are attached to all individual items of the entire blast system and finally, an earth grounding spike is used



to protect each item to be blast abraded. This specific Formula ESD version of blast cabinet is supplied with ultra-violet lighting. This is because some conformal coatings that are UV cured give an enhanced fluorescent response which makes the coating more visible under these 'black lights', so aiding operator accuracy when blasting.

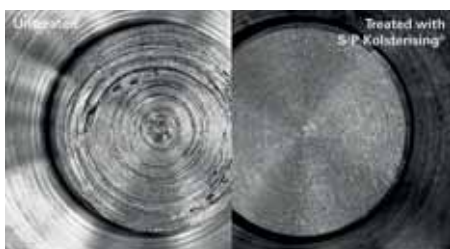
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How to reduce galling in your stainless steel fastener applications

Screws threaded into blind tapped holes are commonly affected by galling and components made of stainless steel are especially susceptible. Stainless steel fasteners are widely used in corrosive environments for their superb corrosion resistance, but often suffer from galling and thread wear issues. Galling is a type of mechanical wear caused by a combination of friction and adhesion between sliding surfaces typically under a compressive load, resulting in damaged threads, broken fasteners, weakened joints, and seized bolts.

Kolsterising®, a surface-hardening process for stainless steel, can significantly improve surface hardness and eliminate galling:

Several factors can lead to galling, such as



low surface hardness, rough surface finishes, the absence of lubricants and using finely-threaded fasteners or locking fasteners. However, some of these features may be essential to fastener performance in certain applications. Therefore, it is vital to balance a fastener's properties accordingly. Generally, once a fastener has seized up from galling it is impossible to remove without cutting the bolt or splitting the nut.

Galling resistance in stainless steel metal-on-metal applications can be achieved through Bodycote's Specialty Stainless Steel Processes (S³P) while preserving the corrosion resistance properties of the base material. Kolsterising is a proprietary process developed to alleviate galling and thread wear issues by significantly increasing the surface hardness (typically >1 000 HV), thereby improving the mechanical performance of such alloy systems whilst maintaining their natural corrosion resistance. After treatment with the Kolsterising process, fasteners exhibit dramatically improved galling resistance, wear resistance, and fatigue strength.

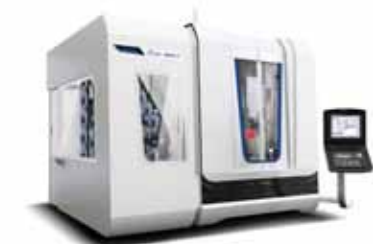
Kolsterising is a low-temperature diffusion

process, not a coating, allowing for treated components to show no changes in dimensions or surface finish. The process is appropriate for a wide range of materials, including austenitic and duplex stainless steels, as well as nickel and cobalt-based alloys. The process produces a hardened layer under the surface of the material, which improves surface integrity and provides more consistent fastener performance.

In the untreated condition, a threshold galling stress of 45.5 MPa (6.6 KSI), was measured. Following Kolsterising treatment, galling was eliminated. At a load setting of 842.5 MPa (122.2 KSI), the compressive yield strength of the material was exceeded, yet no galling was observed.

Even the smallest component can ruin the effectiveness of an assembly line or cause significant challenges, leading to costly downtime and maintenance issues.

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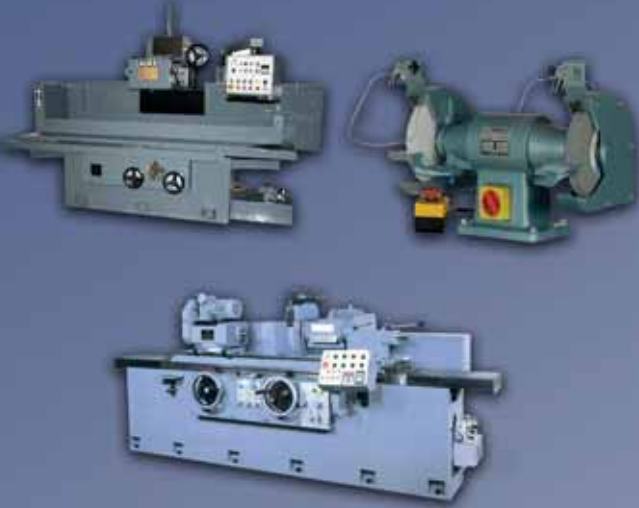


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