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GRINDING & SURFACE FINISHING

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Sharpen drills in-house and save money

The Darex XT-3000 Drill Sharpener from 1st Machine Tool Accessories meets a wide variety of needs by sharpening a range of types and sizes of twist drill and other tools with ease and accuracy. A patented chuck/cam design simplifies operation, so even a novice user can become proficient in a matter of minutes.

The electrically-powered, bench-top machine from the USA, available in manual and semi-automatic versions, can easily pay for itself within a few months through fewer discarded drills and by eliminating subcontract sharpening costs. It comes as standard with CBN grinding wheels for HSS drills, while additional diamond wheels are available for carbide drills. Extra attachments can be interchanged in seconds and all adjustments are made without tools.

The XT-3000 is able to restore the split point cutting edges on a step drill at any angle from 118 to 150 degrees and is equally capable of regrounding the chisel point on a jobber drill. However, the versatility of Darex equipment is such that a split point can also be ground onto jobber drills. This improves entry on manual machines and prevents wandering and oversize holes on CNC machines, despite the absence of pilot holes. Even drills being used to machine tough nickel alloys and stainless steels may be given a new lease of life.



The most recently introduced Darex model, XT-3000 Auto, bridges the gap between a manually operated machine and a fully automated CNC sharpening system. It allows a user simply to align a standard high-speed steel or solid carbide drill, push the start button and step away. A high level of repeatability is achieved, whatever the skill level of the operator.

The auto sharpening system regrinds bits in a three-step process, displaying relevant information on an LCD screen. Many types of right- and left-hand twist drills can be sharpened for machining metals and non-metallic materials. Adapters are available for step drills, countersinks, brad points and 90-degree points. Drills in the diameter range 3 to 21 mm can be processed, although bits up to 30 mm can be sharpened if an adapter is used.

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Continuous-dress, creep-feed grinding



The relationship between Hammill Manufacturing Company and UNITED GRINDING North America dates to the mid-1980s. Hans Ueltschi, now the VP of sales for the cylindrical division, installed Hammill's first STUDER grinder when he was a technician. Hammill president John Hammill Jr. has a deep appreciation for their partnership and how together they have addressed tough engineering challenges over the years.

"I would characterise our relationship with UNITED GRINDING North America as a partnership we've benefitted from for many years," John Hammill says. "They help us continuously add to our manufacturing capabilities. It's a tremendous advantage to be able to drive two hours down the road to Miamisburg and look at one of our products being made.

"They have a team of application engineers and they are always looking for new ways to do things. The future is about doing things differently. You need these guys who have that expertise. That talent is scarce. UNITED GRINDING can add value as opposed to just selling you a machine."

Tool shop and medical divisions

The Hammill family founded the manufacturing company in 1955. The company remains family owned and now

has two divisions: Co-op Tool Production Workholding and Hammill Medical.

Co-op Tool Production Workholding operates from a state-of-the-art 40,000 sq ft design and manufacturing facility in Toledo, Ohio. Its expertise is designing and building production workholding solutions for high-volume machining applications. It specialises in production machining fixtures, custom chucks, complete automation systems, installation integration and programming.

Hammill Medical operates out of a 90,000 sq ft facility about 20 miles away in Maumee, Ohio. The medical division manufactures orthopaedic implants, spinal implants, surgical instruments and implantable medical devices.

Longtime STUDER customer

Hammill has been using STUDER cylindrical grinders for 35 years and at one time was one of the largest STUDER customers in the country with eight grinders. Co-Op Tool utilises two Studer S33 Lean Pro CNC grinders and a Studer S30 automatic grinder to produce the tight-tolerance components required in its workholding devices. The medical division has been utilising a Studer S33 LeanPro to support its ongoing tooling, gaging and fixturing requirements.

The medical division recently invested in a heavy duty BLOHM PROFIMAT MT surface and profile grinder. That purchase has allowed Hammill to take an innovative approach with a tricky part and will provide new opportunities for them in the medical manufacturing sector.

Initially, Hammill reached out to UNITED GRINDING North America to discuss the feasibility of CNC surface grinding a complex-shaped part geometry for a new and innovative medical device they were developing for a key customer. Hammill provided UNITED GRINDING engineering drawings and then made the two-hour drive south to the UNITED GRINDING North America headquarters in Miamisburg, OH. Sure enough, the application engineers were able to develop a suitable grinding process and manufactured prototypes of the complex medical implant. With a good part in hand, Hammill Medical was able to extend its deal with the client and secure a long-term contract to manufacture the part.

Introducing continuous dress creep feed grinding

At the onset of the program, Hammill did not have the volume of work to justify the investment in the BLOHM PROFIMAT MT, so it opted to jury-rig an older surface grinder that it owned. The part became a production

bottleneck for Hammill, taking about an hour to make and also resulting in significant scrap and downtime for dressing and wheel issues.

The make-do solution was slow and over time, as the volume increased, the wheel would dull and break down, putting the workpiece tolerances at risk. They also were scrapping in excess of 20 percent of the material.

After struggling to make production commitments, Hammill Medical approached UNITED GRINDING North America to develop a process to manufacture the part using Continuous Dress Creep Feed grinding (CDCF). To its knowledge, CDCF, which was initially designed for the aerospace industry, had not been used for manufacturing this type of part.

Efficiently producing a higher quality part

Hammill Medical bought the BLOHM PROFIMAT MT to employ the CDCF process, which involves continuously dressing the wheel while grinding the part. The surface and profile grinder worked as expected. Hammill no longer had to stop production for dressing, instead dressing and grinding simultaneously while being more aggressive with cuts.

As a result, Hammill has been able to maintain the profile shape and the size of the part and reduce the cycle time to about 10 minutes. It has significantly reduced



downtime and scrap while producing a higher-quality part.

"It took four to five years before we bought the BLOHM," John Hammill says. "If I could go back in time, I would buy it five years ago. It has opened the door on a whole new set of opportunities."

The future holds more collaborations

After these many years, Hammill continues to work with UNITED GRINDING North America to increase its ability to deliver better parts faster for key clients and compete for new ones in the tool and medical parts sectors.

Hammill cites how UNITED GRINDING North America focuses on customer service

as a reason for their enduring partnership. With the BLOHM purchase, UNITED GRINDING offered to follow up three to six months later with an application engineer for additional training and process optimisation.

"The future for us with UNITED GRINDING is more of the same," John Hammill concludes. "We are a resource for complex parts, so we look to UNITED GRINDING for grinding expertise. That's where the partnership comes in. We learn from them."

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Grinding solutions for medical device manufacturing

Rollomatic understands the high volume, high quality and reliability needed in fine grinding for the medical industry. Combined with economic floor space and manufacturing efficiencies, Rollomatic is able to serve medical and surgical instrument manufacturers with world class service and support.

Rollomatic has been serving the medical device industry for over thirty years. With the growing demand created by an aging population and new technologies for advanced and robotic surgeries, the volume and complexity of the instruments required is constantly changing. These challenges are exacerbated by the skilled labour gap. Medical devices also present the additional regulatory requirements that most manufacturers do not face, furthering the need for process control, repeatability and traceability.

Rollomatic is able to serve the medical sector by not only focusing on building high quality, precise machines but offering the highest level of training and support to its customers. From surgical drills to bone saws, rasps, rotary instruments such as routers and burs and even core pins for plastic injection industry, Rollomatic has solutions that are reliable, repeatable and precise. With the launch of the Rollomatic Learning Centre, the company is investing in addressing the skilled labour gap by offering structured training, whether face-to-face or e-learning, with content focused on customer's applications.

GRINDSMART 630XS

The 6-axis precision tool grinder GrindSmart®630XW has been designed for high performance and specialty tool manufacturing for both long and short batches. It is equipped with linear motors which, combined with the torque motor on the rotary axis, provides more benefits such as enhanced surface



finish and reduced maintenance costs. The oil used for cooling and lubricating the linear motors is the same as the coolant oil. This ensures consistent thermal stability during setup and production without incurring additional energy consumption.

GRINDSMART NANO6

The high precision 6-axis grinding centre GrindSmart®Nano6 has been designed for the production of high-performance micro-tools made of carbide or HSS with a diameter range between \varnothing 0.03-2.0 mm, .001"–.080". Thanks to its innovative hydrostatic technology, this extremely compact machine offers superior performance for manufacturing of high precision micro-tools.



LASERSMART 510 FEMTO

The LaserSmart®510 femto with its innovative and powerful femto laser source provides unlimited machining possibilities.

Maximising productivity, precision and surface quality, the femto laser source builds upon the success of the LaserSmart series. Not only are PCD, P-CBN, CVD, MCD, and natural diamond materials feasible, but also ceramics, carbide, sapphire, glass, or even new material combinations. These revolutionary machine processes allow customers to achieve the results that set the new standard in ultra-hard material machining.



For many years, the GrindSmart 630XS has been the most widely used machine in the surgical instrument manufacturing space. While Rollomatic still see strong demand for this model, many of its customers now see the benefit of the GrindSmart 630XW to incorporate automatic wheel changes, allowing for greater flexibility in unattended production of tool families. Most rotary instruments would typically require blank preparation before the end grinding operations and, for this purpose, Rollomatic has developed all grinding processes suited to the ShapeSmart® series. For the medical plastic and die/mould industries, the ShapeSmart series has helped customers achieve greater outputs and tighter tolerance components fully automated.

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Mastering the art of micro-grinding medical wire

Micro-grinding requires meticulous attention to detail

During a medical procedure, the quality of the wire being used can mean the difference between a successful outcome and a product failure. One of the biggest distinguishing factors of an exceptional wire is tolerance and that is achieved through superior micro-grinding capabilities.

Over the years, micro-grinding has been growing as an aspect of advanced manufacturing technology. As machines have become more sophisticated with the development of rigid machining tools, so too has the art of micro-grinding. Companies that specialise in this type of machining have emerged as important players in many different industries.

Micro-grinding is a tool-based machining process that creates micro-features on hard, brittle materials. It uses a large tool to create minute details, which makes it an extremely important process when a product requires precise specifications, such as in the medical industry. Doctors need devices, such as catheters, pins and wires for angioplasty and other procedures, that enable them to navigate or insert tools in the exact right place.

Micro-grinding can be used on many different types of materials, including glass and plastic, but the primary focus for companies that work within the medical industry is on stainless steel and nitinol.

Wire grinding requires a combination of meticulous attention to detail and an efficient process that produces components at a rapid rate. Custom Wire Technologies (CWT) is a specialist manufacturer of medical wire, with years of experience producing standard and complex geometries in a range of sizes.

CWT's capabilities range from a minimum starting size of 0.005", 0.13 mm, OD to a maximum starting size of 0.188", 4.78 mm OD, with lengths of 10 ft and beyond. The company specialises in core wire centreless grinding, which results in an exceptional finished product.

Which type of grinding is right for your project?

Centreless grinding secures the material



between two rotary grinding wheels and adjusts the speed at which they are rotating relative to each other to change how the material is shaped. Centreless grinders are particularly useful because they offer outstanding production capability that doesn't decrease the quality of the product.

Other advantages include fast loading, long life and no deflection. Sometimes, medical devices require customised mandrels with unique designs. Specialised manufacturers like Custom Wire Technologies can accommodate specialty wire mandrels and wire stylets at its customers' request. In many cases, mandrels address very specific needs, such as tapers or steps and they can grind them with multiple taper levels and very tight tolerances.

Orthopedic wires, for example, can necessitate complex designs requiring highly individualised manufacturing processes. Kirschner wires, K-Wires, Steinmann pins and olive wires are all types of devices used in orthopaedic surgeries as components or fasteners for hand and foot surgery. As these components have the critical job of holding patients' bones together, they need to be precise both in design and tolerance. Micro-grinding is the only way to obtain the type of precision required. Manufacturers use the highest quality equipment to produce custom

designed orthopaedic wires that stand the test of time.

When a component has a very complex geometry, it may not lend itself to the centreless grinding process. Profile grinding involves precision grinding the outside diameter of cylindrical parts. It can be particularly helpful for parts with features such as grooves, radii and tapers.

In some cases, manufacturers can use form grinding, in which the component's profile is formed into the grinding wheel. This type of grinding works well for threads, points and specialised profiles in a wire. Companies grind flat wires for medical components using profile grinding. They also use the process for grooves, notches, steps, bumps and flats.

Micro-grinding is complex and varied, which is why some manufacturers prefer to outsource it. When it's performed well, however, it can turn a good component into an excellent component that performs beyond expectations. Custom Wire Technologies specialises in OD profile and centreless grinding, but provides additional services for products like guidewires, K-Wires, orthopaedic pins, needles and more.

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Perfection in grinding technology

Grinding & Surface Finishing visits Hardinge Kellenberger's impressive new facility in Goldach, Switzerland



Kellenberger AG was founded in 1917 by Leonhard Kellenberger. Its earliest success resulted from its universal grinding machine and the company participated in its first machine exhibition in Basle, Switzerland in 1919.

In 1956, Edgar Kellenberger assumed responsibility for the company. Under his leadership, the company was successful by regularly updating its universal cylindrical and cutter grinding machines and by expanding the export of its products. By the late 1970s, Kellenberger had worked with the Swiss electronics manufacturer Grossenbacher to develop a numerically controlled system for its machines. In 1989, the third generation of the Kellenberger family assumed responsibility for the company when Jürg Kellenberger was appointed managing director. The company continued to grow and was acquired by Hardinge Inc. in 1995. Five years later,

Hardinge added to its grinding portfolio by purchasing Jones & Shipman, Hauser, Tripet, Voumard and Tschudin.

New facility

In a groundbreaking move that cements its position as a leader in precision engineering and manufacturing of grinding, Hardinge Kellenberger has unveiled its state-of-the-art facility in Goldach, Switzerland. This new establishment marks a significant milestone in the company's journey, showcasing its commitment to innovation, sustainability and excellence. Covering an expansive area and equipped with cutting-edge technology, the company's facility is set to greatly advance the industry and elevate Switzerland's reputation as a hub of precision grinding. With its advanced technology, state-of-the-art research & development centre and focus on nurturing talent, Hardinge Kellenberger is set to greatly advance the precision engineering and manufacturing landscape of grinding on a global scale. As Hardinge Kellenberger continues its legacy of excellence, the world can anticipate groundbreaking solutions and products that epitomise precision and craftsmanship.

Viktor Gaspar was appointed CEO of Hardinge Europe and Kellenberger AG in March 2020. In this exclusive interview with Grinding & Surface Finishing, he explains



Viktor Gaspar CEO of Hardinge Europe and Kellenberger AG.

how exponential growth resulted in the move to a new facility and the company's plans for the future.

"We moved to our new facility in July this year. Our previous facility was in the middle of St Gallen, where the company was located for 103 years. The space became too small for us and we simply could not grow there anymore.

"The decision was made to move to new premises around four years ago when I started here. We were looking at ways we could grow the company and I realised there was a capacity issue as we were building 165 machines in the current facility. The owners wanted to grow further and so we made the decision to build a brand-new facility. The official opening was on the 9th of September.

"At our new facility, we have capacity for up to 350 machines per year. 81 percent of our business goes into Hardinge Kellenberger machines, 10 percent into Hauser machines, 7 percent into the Voumard brand and 2 percent into the Tschudin range."

All grinding machine brands belonging to Hardinge, like Kellenberger, Voumard, Hauser and Tschudin, have been brought together in one place with sales, research





and development, production, assembly, warehouse and administration.

For the new plant in Goldach, the future production concept is based on the complete detachment from rigidly predefined areas as they are in use in a flow production. Instead, an innovative laser concept will line out exactly the production structure that is needed at the moment.

Streamlined production processes and an optimised assembly process bring about high improvements in capacity and efficiency. Vibration-insulated foundations will significantly reduce noise pollution for employees.

The new production facility has been developed with sustainability in mind. A central cooling and compressed air system incorporating groundwater as well as Lake Constance water in accordance with the latest environmental aspects will help to reduce operating costs. Bringing the brands together in one place eliminates time-consuming and costly commuting between the sites.



Time-consuming and cost-intensive commuting between the St. Gallen, Wittenbach and Romanshorn sites will also be eliminated by merging the brands at the Goldach location.

The 4.45-acre production hall will serve

as the new location's centerpiece housing the following areas: Spindle construction; Grinding shop and measuring area; Showroom and Training workshop.

The vision

Viktor Gaspar continues: "We have a nice slogan which is called: 'Perfection in grinding technology.' We exist because of our past. Where do we want to go? We want to be a global leader. We are already a global leader on the technology side, but not from the market side. We want to develop new machines and our strategy is to develop components and then components will help to produce new machines. If you research the total market of grinding machines, it is worth around 2.1 billion, USD, globally every year. The market that we are operating in, however, is worth around 700 million. The overall market consists of service grinding, cylindrical grinding, centreless grinding, smaller machines and jig grinding. We are operating in the cylindrical grinding and jig grinding markets right now."

Providing added value for its customers continues to be the focus of Hardinge Kellenberger. Viktor Gaspar concludes: "Today's customers don't buy machines, they buy solutions, and we want to further meet this demand with the best machine configurations in the grinding sector."

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Registration now open for GrindingHub 2024

Interested in showcasing your innovative products and technologies to a select target group? Companies will be able to do just that from May 14-17 2024 at GrindingHub in Stuttgart, Germany.

After successfully launching the event last year, the organiser VDW, German Machine Tool Builders' Association, in cooperation with Messe Stuttgart and Schleiftagung, is keen to repeat the success as it opens registration for the event. Dr Wilfried Schäfer, executive director of VDW, is full of anticipation: "We launched the GrindingHub in 2022, attracting large numbers of satisfied exhibitors and visitors. We want to build on this in the coming year. We are already looking forward to seeing everyone again in Stuttgart and are extending a warm invitation to all grinding experts, encouraging them not to miss this highlight in the industry calendar."

GrindingHub is the new international centre for grinding technology and superfinishing. The trade fair's focus is on all aspects of value creation in this technology area. Centre stage is taken by grinding machines, tool grinding machines and abrasives. All of the relevant software tools, the process periphery and the measuring and testing equipment needed for QM processes relating to grinding are presented, keeping the entire production environment of grinding technology in view.

The internationally oriented trade fair starts with a hybrid concept. Accompanying the event and also between events,

GrindingHub offers digital formats for match making, web seminars, conferences as well as the communication of current trends and innovations across all channels.

VDW, Swissmem and Messe Stuttgart have formed a strong team with high international competence in the industry and trade fairs. The hosts and the exhibiting companies align GrindingHub along the current trends, using their extensive know-how for the sector and the user industries worldwide. The attractiveness is also enhanced by themed focus topics, for example in the special exhibition area 'Grinding Solution Park'.

The first GrindingHub exhibition took place in 2022 with a total of 9,500 visitors crowded into the three fully booked halls. Around 40 percent of them visited the show from abroad. "Everywhere you see happy faces", said Dr Wilfried Schäfer, executive director of the VDW. "We are more than satisfied with the success of this first ever GrindingHub. The entire concept, planning and organisation were a triumph. The new trade show for grinding technology proved a complete success thanks to the great response from visitors and the strong commitment of the exhibitors."

The manufacturers from 23 countries pulled out all the stops for the debut event. They exhibited numerous grinding-related innovations, everything from new tool



concepts through to innovative processes, procedures, and interface technologies. An impressive sight was the total of more than 240 machines which worked live at the exhibition ground, many of them on large and prestigious stands. After more than two years, visitors were finally able to experience grinding technology live and at first hand again.

The success of the GrindingHub is also confirmed by the positive feedback from exhibitors. Along with many others, Bernd Dürr, head of the grinding business unit at the Emag Group in Salach, was highly impressed by the event and is planning to return: "We are more than satisfied with what we achieved at the GrindingHub. The event provided us with an excellent platform for presenting our machines, technologies and services to a broad trade audience and for establishing valuable contacts."

"We really appreciated the opportunity to network with other exhibitors and professionals from the sector. We were most impressed by the overall concept and firmly intend to return to the GrindingHub."

In 2024, the focus will again be on grinding machines and abrasives, but also on the entire production environment of grinding technology, such as appropriate software tools, process peripherals and measuring and testing systems. Interested companies can register now to secure their place at the grinding technology trade fair.

Further information is also available on the GrindingHub homepage at:

www.grindinghub.de

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PTG Holroyd wins Siemens' global award for digital transformation at EMO Hannover

EMO Hannover 2023 didn't just provide PTG Holroyd with a platform to showcase its industry leading helical rotor and gear milling and grinding machines to a global audience. During the event, the UK-based machine tool manufacturer was presented with the Siemens' Digital Transformer award.

The Digital Transformer award was just one of three awards made by technology giant Siemens during its MACHINUM awards ceremony. This took place on day three of EMO Hannover and celebrated OEMs and end users globally that are innovators, visionaries and champions of machine tool digitalisation.

PTG Holroyd was the first UK-based machine tool manufacturer to embrace the capabilities of Siemens' future-proofed SINUMERIK ONE CNC and the Digital Transformer award reflected the company's approach to digitalisation when designing its new HG350 range of gear and helical profile grinding machines.

"It was an incredible honour to accept the award on behalf of the entire PTG Holroyd team," says PTG Holroyd's sales director, Mark Curran. "We have always built advanced machine tools that simplify the manufacture of complex helical components. In fact, our drive for making the complex simple is one of the reasons we became the very first machine tool manufacturer in Britain to use the SINUMERIK ONE CNC."

In creating the HG350 range, PTG Holroyd's objective was to offer its international customer base much more than a next generation machine for the one-off and batch grinding of high-accuracy precision spur and helical gears, as well as worms and screws.

"We wanted to reduce time to market and ensure affordability, all while creating a rotor and gear grinding machine that would be highly intuitive for operators and feature future-proofed technology, class-leading safety and the highest levels of industrial security," adds Mark Curran. "These were all attributes that the SINUMERIK ONE CNC was able to offer. Additionally, the SINUMERIK ONE software suite's 'Create



My Virtual Machine' and 'Run My Virtual Machine' digital twin capabilities offered significant advantages to us and to our customers."

Commenting on Siemens' decision to recognise PTG Holroyd with its Digital Transformer award, Sarah Black-Smith, general manager for motion control at Siemens, adds: "I was delighted to be part of the team that presented PTG Holroyd with this global accolade. Our machine tool systems team in the UK worked closely with PTG Holroyd to incorporate the SINUMERIK ONE CNC into its new HG350 range. As a result, PTG Holroyd has more than met its objectives of reducing time to market, controlling costs through design and improving machine build and commission time, ultimately providing machine tool operators with an enhanced user experience and simplified component production. The digital technology that Siemens offers has given PTG Holroyd a competitive advantage in terms of efficient engineering, with the 'Create My Virtual Machine' capability enabling each new HG350 machine to be built and run on the desktop long before any physical build commences."

Celebrating the game-changers and innovators who push the boundaries of machine tool production, the three awards presented by Siemens during its

MACHINUM event at EMO Hannover, comprised a Digital Pioneers award, the Digital Transformers award that was won by PTG Holroyd and a Loyalty award.

Incorporating the brands of PTG Holroyd, PTG Powerstir Friction Stir Welding and Holroyd Precision Rotors, PTG has established itself at the forefront of high-precision machine tool design, build and supply for specialised applications. The range includes advanced machine tools for the production of complex helical components such as compressor rotors, screw pumps and high-accuracy gears and Powerstir machine tools for friction stir welding advanced alloys used in transport applications. With production facilities in the UK, USA and China, Holroyd Precision Rotors manufactures the special purpose, ultra-precision helical components used in a wide range of industries, including refrigeration, air-conditioning, gas and vacuum pumping, industrial air handling, aerospace, medical equipment, motion control, power transmission, power generation, oil & gas, fluid transfer and high-end automotive. PTG also provides advanced technical consulting services.

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W 11 CNC cylindrical grinding machine from EMAG Weiss

Perform a variety of grinding tasks in quick succession

Extreme dimensional accuracy and maximum efficiency. Under these specifications, external cylindrical grinding is an indispensable process for contract grinders, medical technology, general mechanical engineering and many other industries. However, especially for smaller series or prototype production, it is important to have a grinding solution that is as universal as it is flexible and that can be retooled and configured in a very short time. How can process reliability and accuracy be guaranteed under these circumstances? EMAG Weiss provides an answer to this question with the W 11 CNC cylindrical grinding machine for workpieces with a diameter of up to 500 mm and a length of up to 1,500 mm. The entire technology is designed to perform a wide range of machining requirements in rapid changeover.



The initial situation is as familiar as it is challenging. Many users in industry machine shafts and other rotationally symmetrical components using a final cylindrical grinding process. Subsequently, the surfaces exhibit exceptional precision and quality in the μ range. However, smaller quantities or prototypes thus become a special task, because each machine setup takes a relatively long time and, of course, any error must be avoided. In this context, the W 11 CNC from EMAG Weiss is a special solution: a CNC-supported external-internal cylindrical grinding machine, which can also be operated manually or be equipped flexibly with different grinding wheels. For example, when machining with one wheel from the side, one can use parallel machining with two external grinding wheels or the combination of internal and external



grinding wheels, as well as many other variants. There are also few restrictions on the type of wheels, diameters of 400 or 500 mm and widths of 10 to 120 mm are possible.

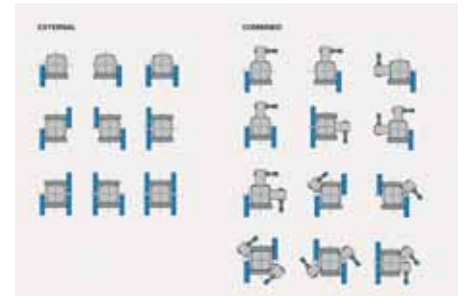


Intuitive operation facilitates processes

The aforementioned flexibility is ensured by a whole bundle of measures. For example, the basic control system already contains all common grinding cycles. The operator calls them up via an easy-to-understand dialog interface and enters the required dimensions via fields. In addition, automatic dressing, grinding of several diameters, saving of grinding sequences, contour dressing and taper grinding in path mode are all easily possible with the CNC control. However, the following always applies here: anyone who wants to carry out the process manually can do so at any time, bypassing the CNC control. In any case, the good accessibility of the machine facilitates the operator's work.

At the same time, the mechatronic details around the workhead, tailstock and grinding head of the W 11 CNC score points when it comes to executing fast changeover processes:

- For example, the spindle mount, with MK4, MK5 or MK6 adapter, has a precision bearing and the speed can be continuously



adjusted from 1 to up to 650 rpm, even 2,000 rpm is possible as an option.

- The tailstock (MK4) can be operated manually and pneumatically by foot switch. The quill holder with a stroke of 45 mm enables loading between centers up to a weight of 250 kg. Optionally, the machine can also be equipped with an NC tailstock with a travel of up to 300 mm for a maximum workpiece weight of 350 kg. In addition, manual cylinder correction is also another option.

- Also standard and important for flexibility is a direct-drive B-torque axis for stepless swiveling and positioning of the grinding head with a resolution of just 0.0001 mm.

- Last but not least, optional in-process measurement based on Marposs measurement control is available.

Changeover processes in just five minutes

The effect of this combination of high-tech equipment and intuitive control is demonstrated by various practical examples, as the machine is currently in use in many facilities. For example, the experts at EMAG Weiss estimate that many changeover processes take just five minutes. This example shows its value in the production of part families with multiple component changes, leading to enormous time savings over a shift or a week and always against the background of enormous dimensional accuracy with tolerances of just 0.001 mm. In addition, users have a future-proof solution that can handle a wide range of tasks.

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Generating grinding of double helical gears

In future, generating grinding can also be used under certain conditions to produce double helical gears. This means Liebherr-Verzahntechnik GmbH is expanding its range of processes for hard-finishing for this gear type to meet the very highest quality requirements. Compared to established processes such as profile grinding or hard milling, generating grinding is much faster and therefore also provides an interesting alternative from a commercial perspective.

Double helical gears combine the advantages of both spur gears and helical gears: transferring of high forces, quiet running behaviour due to increasing the contact ratio and a reduced axial bearing load. They are used wherever a high-power density is required from the gears. Their range of applications extends from very small, lightweight and compact parts in aerospace to powerful turbo transmissions and very large-scale applications in energy and materials handling technology.

Today, due to increased quality requirements in terms of their efficiency, quiet running and noise development, double helical gears increasingly need to be hard-finished. For manufacturing reasons, only 4- or 5-axis hard milling is possible for continuous double helical teeth with no gap between the top and bottom gears. Profile grinding has become established in most cases for double helical gears. Liebherr-Verzahntechnik GmbH has now succeeded in developing generating grinding as a precise and efficient alternative for this hard-finishing.

With Liebherr having already optimised the soft machining of double helical gears by means of precise correction measurement in gear shaping, the company is now taking hard-finishing to a new level. The cycle times can be up to ten times faster when compared to profile grinding. The quality produced meets the very highest accuracy and surface roughness requirements. The workpiece simply has to meet the following requirements: the distance between the two gears is at least 23 mm and the module must not be larger than five.

This has been made possible, for example, due to the development of robust grinding materials enabling the economic application of worms with a very small



diameter. Triangular or rod-shaped sintered corundum grinding material or cubic crystalline boron nitride with a galvanic or ceramic bond are used as cutting materials. Liebherr is able to offer the optimal cutting material according to the application and requirements.

To ensure minimal tool overtravel, two grinding worms are used whose lead direction matches the gears to be ground in each case. The left-handed gear on the double-helical is machined with a left-handed grinding worm, the right-handed gear is machined with a right-handed grinding worm. The two grinding worms are on a long arbor and are controlled by software with the gear being machined consecutively, in one clamping. Each of the two worms can both rough and finish the workpiece.

In the generating grinding process itself, the grinding of the upper gear is completed first. This serves as a reference for the angular position of the two gears in relation to one another. Via an adapted centering process, the lower gear is then very precisely ground with position orientation in relation to the first gear. Machining in one clamping fixture enables an outstanding pitch to be achieved.

Besides the significantly faster machining times, generating grinding has other advantages compared to profile grinding: the method is more resistant to stock variation and distortion due to heat treatment. In addition to the precise apex



point, it also achieves much greater precision in the angular position (index) of the two gears in relation to one another. It also improves the surface roughness and provides greater stability when grinding the dedendum contour. The individual quality of the lead and the lead quality overall is very high thanks to the continuous process. This means that topological modifications such as specific end reliefs or twist-free grinding can be manufactured economically. The risk of grinding burn is also lower.

For the generating grinding of double helical gears, a powerful and dynamic grinding head with a counter bearing is required which enables machining with both small and long grinding worms. Liebherr's newly designed GH 240 CB grinding head is suitable for this. It has both main and counter bearings to rigidly clamp the tools, and achieves a maximum spindle speed of 12,000, or even the option of 17,000 revolutions per minute.

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Premium solution for grinding large gears

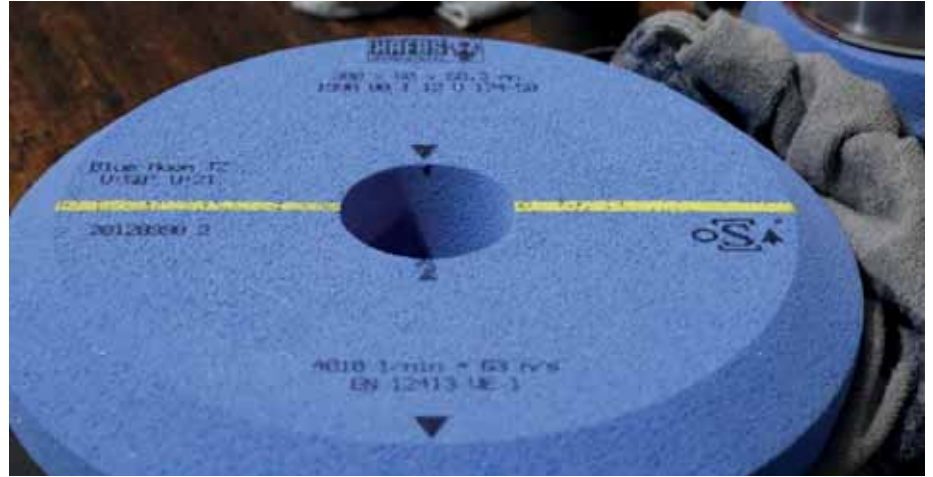
Precision shaped abrasive grain Blue Moon TZ for maximum material removal rate

Serial production of large gears requires a high level of quality, excellence and continuity in production. Particular emphasis is placed on maximum synergy between the grinding machine, the grinding process and the grinding wheel.

After several successful trials on various Klingelnberg Höfler Rapid grinding machines carried out by Krebs & Riedel with customers in their production facilities, Krebs & Riedel has received several large orders for grinding large gears from abroad and has introduced the new premium grinding wheels with high process reliability.

Krebs & Riedel is one of the world's leading manufacturers of grinding wheels for gear grinding in the automotive and EV sector. The family-owned company is also expanding into other sectors where large gears are manufactured with the new Blue Moon™ TZ premium product range.

In recent years, wind power has been an important factor in reducing CO₂ emissions. Wind turbines are getting bigger and more powerful, while production costs have to be reduced. This requires production methods that can produce the gears cost-effectively and in high quality, even with complex flank modifications. Gear sizes in wind power typically range from 800 to 4,000 mm. Some gears can even reach a diameter of 8,000 mm and weigh up to 100 tonnes. The



most common size in the field of external gears is 1,200 mm in diameter and ranges from module 12 to module 52. The profile grinding wheels typically have a diameter of 100-450 mm.

Synergy between the grinding machine, the grinding process and a premium grinding wheel is very important. Only a perfectly ground gear geometry ensures optimum power transmission for high wind turbine efficiency and smooth running. Grinding burn must be avoided under any circumstances, because the forces in the gearbox are very high and tooth breakage is very expensive. High-precision gear quality is a matter of course at Klingelnberg and Krebs & Riedel. It increases the service life

of the individual gear components and makes a significant contribution to reducing maintenance and production costs. To achieve maximum synergy between the grinding machine and the grinding wheel, Krebs & Riedel optimises the process with application support at customers sites around the world and offers, with the Blue Moon TZ, a new premium grinding wheel with a precision-shaped abrasive grain.

Precision-shaped abrasive grain ensures a very cool grind

Blue Moon TZ is characterised by a very high cutting performance and a very high material removal rate. "In some trials, the material removal rate (Q_w) was more than 30 mm³/mm" says Sigurd De Ridder, senior application engineer at Krebs & Riedel, who conducts trials and process optimisation for customers worldwide. He says: "Precision-shaped abrasive grains are state of the art today. Blue Moon TZ is comparable in performance to other precision-shaped abrasive grains on the market. It is self-sharpening, very sharp-edged, microcrystalline and has an elongated trapezoidal shape." The homogeneous pore structure of Blue Moon TZ contributes to an extreme improvement of the entire cooling system during the grinding process. Due to the open structure, the entire grinding wheel is immediately flooded by the cooling liquid. Even with extreme material removal rate, the chip is transported away from the contact surface. This avoids heat input that could lead to thermal damage to the gear.



Grinding large gears in serial production with the highest quality while reducing production time

On average of all tests on Klingelberg Höfler Rapid 2500 machines, Sigurd De Ridder had the following grinding results: A cooler grind and a longer tool life, combined with up to 20 percent faster grinding time compared to standard grinding wheels. The longer tool life and higher grinding performance helps to reduce costs while achieving the same, or even better, quality of the gear. On average of all dressing tests, Sigurd De Ridder achieved the following results: 20 percent longer dressing intervals, 30 percent less infeed, which also leads to a longer tool life of the dressing wheel. Another side effect is that the machines have a lower power consumption after the optimisation.



Huge profile grinding machines with absolute precision, speed, and flexibility

The profile grinding machines of the RAPID series for large workpiece sizes are designed for component diameters up to 8,000 mm. Depending on individual requirements, they are equipped with an extended stroke range (L variant) and are also available in two variants. In addition to the standard configuration, the machine is also available with a small grinding head to accommodate very small grinding wheel diameters of 300-20 mm (K variant). In all configurations, machines of the RAPID series can be converted from external to internal gears in a very short time by means of optional internal gear grinding arms.

In addition, the special arrangement of the machine axes, a thermally stable and almost vibration-free machine bed made of mineral casting, as well as wear-free torque drives in the machine table and the grinding head for 5-axis grinding contribute to the proven precision, consistent quality and enormous flexibility.

Thanks to the highly flexible grinding head with integrated 3D probe and adjustment of the helix angle during the grinding process, gears can be topologically modified in 1-flank grinding or 2-flank grinding,

depending on the permissible deviations. The measurements with the optionally available testing devices ensure a controlled grinding result already during the grinding process.

Choose a premium grinding wheel for large gears

Serial production of large gears requires many hours of workpiece setup, programming, grinding, dressing and quality control. It is important to use a premium grinding wheel with precision-shaped abrasive grain. The dressing and grinding processes should be perfectly set up on the grinding machine and optimised by application support. The Blue Moon TZ premium grinding wheels have not only proven themselves in the grinding of planetary gears, spur gears and IR outer and inner rings. They have also led to a reduction in production costs when grinding drive shafts, automotive gears and conveyor screws.

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A world of grinding since 1923

Grinding machines, tool grinding and automation

J SCHNEEBERGER is a Swiss, family-run business devoted to grinding. Since Walter Schneeberger founded the company in Roggwil, Switzerland in 1923, the company has worked with great consistency and success on creating added value for its customers. Today it works for its customers in practically every developed country.

J. SCHNEEBERGER Maschinen AG has been developing and producing precision grinding machines since 1923. From the outset, it has strived for the greatest degree of universality and maximum precision with a broad product range of grinding machines with integrated robotics.

Service-oriented, it has a dense network of service station facilities local to its customers. The focus of the development teams in the company headquarters and the in-house manufacturing enable it to implement new ideas quickly. It relies on its own expertise in many special areas including the development of its own grinding software Quinto.

The company has achieved success

throughout the world with tool manufacturers in the automotive and aerospace industries, service providers, service departments in large-scale manufacturing, the textile industry, in the watch-making industry and in medical technology.

Norma NGC750 is a popular machine worldwide for sharpening all types and sizes of gear cutting tools. An economical system, yet suitable for oversized tools.

Norma NGC750 comes with a 750 mm X-stroke instead of the standard 470 mm. The 5-axis grinding machine expands the broad SCHNEEBERGER portfolio and unbeatable cost performance for grinding big tools.

Examples of tools, but not limited are: Long gear hob or complex hob in one body; Shaper cutter and skiving cutter sharpening; Solid carbide long drill for deep hole drilling or oversized taper ball nose milling cutter and sharpening for turbine industry. At the recent EMO exhibition, a big hob with 320 mm long cutting edge, 180 mm diameter and



several rotary tool sharpening are shown. Seven positions grinding wheel loader and MIL part loading system ensure maximum productivity. Optional items like CNC following steady rest, hydraulic tailstock or SCARA robot can be implemented upon actual application.

The Qg1 CAD/CAM grinding software provides quick and easy programming of various tools. Toogle, the rich database for nearly all kind of tools requires a few simple steps to get an individual and optimised grinding program.

J. SCHNEEBERGER Maschinen AG

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"Swarm-based" gear grinding and machine component monitoring

Authors: Dr Christian Dietz and Walter Graf, Reishauer AG, Switzerland



Automatic Grinding & M/C Component Monitoring

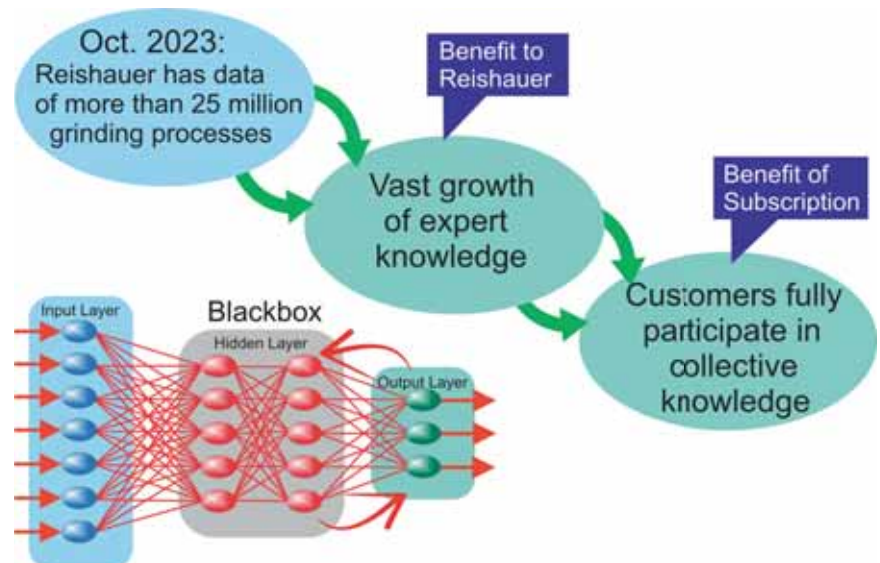
ARGUS is a cloud-based system for monitoring gear grinding processes and gear grinding machine components. "Swarm-based" refers to a large population of gear grinding machines from independent customers connected to the ARGUS system and its cloud. These "swarm" machines continuously feed their anonymised process data into a database. Reishauer uses this data for Big Data Analytics to identify successful and negative process patterns. While the system can operate as a standalone version, even if a customer had about 50 machines, their data would never be sufficient to gain the insights a cloud-based database offers. A single customer never has the variety of workpieces found in the cloud. Among many customers, there are always those who discover new approaches that benefit all subscribers once validated by ARGUS. Since an ARGUS subscription offers automatic updates with all acquired insights, subscribers constantly benefit by ensuring they maximise the potential of their grinding machines.

As of October 2023, Reishauer already

has around 25 million grinding cycles and all associated data points, with each cycle containing about one million data points. All data remains anonymous. This data is a sufficiently large pool to apply data science and use AI for pattern recognition and algorithm optimisation. The insights gained from the data analysis can continuously be

fed into the updates for the benefit of all subscribers.

Reishauer developed ARGUS based on Artificial Intelligence (AI). To effectively use AI, several conditions must be met. Firstly, clean data is required to derive physical laws and develop algorithms. This also requires gearing experts who can program



the necessary algorithms. In short, AI must be hard-won. 'Intelligence' in AI is based on lengthy processes where clean data sets are sent through neural networks. The results must be checked, revised and re-sent through the neural network. This way, the AI system continuously learns, corrects itself and adjusts the algorithms. What can artificial intelligence do better than human intelligence? AI can quickly find the proverbial needle in a haystack. AI is based on pattern recognition and uncovers unusual correlations in vast amounts of data that escape human intelligence.

Automated machine component monitoring requires a cloud structure for data storage to handle large amounts of data.

In addition, machine algorithms are required to evaluate the data about the state of the machine components in real-time using AI with the 'Automatic Component Diagnosis' (ACD) function. The grinding machine carries out autonomous cyclical tests reflecting the state of the components. The machine checks itself without staff intervention and without interrupting the production cycle. This allows for preventive maintenance, saving the user costs and predicting machine downtimes.

The precision of the algorithms and acquired insights lead to advancements.

While error analyses used to be time-consuming, experts can now carry out an error analysis at lightning speed with the help of ARGUS. They can remotely predict a possible NVH issue (disruptive transmission noises) from the signals and prevent faulty parts from being installed in the finished transmission.

In addition to Automatic Component Diagnosis (ACD), ARGUS includes the following five main functions:

Grinding intensities

Once the grinding intensities of the roughing and finishing processes are set, it ensures the accuracy of parts ground within the limits and enables 100 percent quality control.

NVH detection

ARGUS has proven invaluable in detecting and avoiding NVH issues. Through spectral analysis, ARGUS can identify NVH-critical parts in advance.

Grinding wheel monitoring

In the past, individual operators subjectively assessed grinding wheels. ARGUS provides clear analysis and monitoring of a grinding wheel's performance throughout its life cycle.

Crash detection

The machine immediately moves to a safe position if ARGUS detects excessive grinding intensities.

Adaptive grinding

Adaptive grinding effectively stabilises the grinding process when the pre-processing is of low quality. An adaptive grinding process keeps the grinding forces constant, ensures protection against overload and reduces tool wear.

Conclusion

The foundation of ARGUS is a highly developed, well-functioning grinding machine. It is an add-on to the successful machine concept, enhancing the machine even further and providing transparency and control at an unprecedented level. This transparency, control and the continuous improvement offered by a subscription in the form of a constantly expanding database provide customers with a powerful tool to derive maximum benefit from their gearing processes.

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Nine essential tips to ensure safe operation of bonded abrasive wheels



9 Essentials to Ensure Safe Operation of Bonded Abrasive Wheels

With the vast majority of accidents being caused by user error, there is a lot that cutting and grinding wheel users can do to prevent problems occurring both before and during use.

The rotational speed of a handheld grinder is 80 m/s, equivalent to 290 km/h or 180 mph, roughly the same speed as a Formula 1 racing car. For a 100 m/s machine you're looking at 223 mph. These two stats underline how crucial it is that bonded abrasives are handled with care.

Here, SAI Abrasives provides its top tips to ensure safe and smooth operations with cutting and grinding wheels.

Correct storage

Abrasive wheels are sensitive to moisture and temperature, if stored incorrectly they will degrade before their time.

It is therefore essential to store abrasive wheels in premises with moderate temperature and humidity. Direct exposure to sunlight and contact with aggressive chemicals must be avoided and wheels should not be placed directly on the floor, near cold or damp walls or near heat sources such as stoves or heaters. Wheels should be stored in their original packaging, which guarantees maximum protection. Once removed from the packaging, they must be kept in special racks.

Invest in quality

Beware cheap wheels, particularly if you have a high-performance application. There are many variables within a wheel as low-grade abrasive grains, resin or fillers used within the recipe can affect the overall performance of the wheels. There may also be less reinforcement used within the product, making them less resistant to lateral pressures. Alongside this, cheap wheels are also often a false economy. They don't last as long, which results in more wheel changes and downtime for operators.

But with one wheel looking pretty much the same as another on first glance, how do you separate the best from the rest? The answer lies in the label, where you'll find key indicators of quality. European-manufactured wheels that meet the mark will feature the logo of The Organisation for Safety of Abrasives (oSa) and should also have EN12413, the European standard referring to safety requirements for bonded abrasive products, printed onto the wheel. Look for ISO 9001 certification in your manufacturer as well.

Do not modify

Another key cause of accidents is wheel modification, specifically attempts to increase the size of bores in order to make them fit onto machines that they were ultimately never designed for. Hammering

out of bores or forcing wheels onto machines introduces cracks which are often invisible and which radiate out from the centre when the wheel is put into use. This can result in the explosion of the wheel. Always pick a wheel that is a native fit to the mounting apparatus of your machine, rather than attempting any adaptations.

Match wheel and application

One of the major contributors to wheel breakage is utilising a wheel that is not appropriate for the material being processed. If a wheel is not the right match for the material, the operator will often have to lean more heavily on their machine, which inflicts stress on the wheel and increases the chance of breakage. By selecting the appropriate hardness of wheel, the operator can achieve free cutting/grinding and therefore minimise problems. As a rough guide, soft wheels are preferred on hard materials and hard wheels are preferred on soft materials. Also remember that cutting wheels should never be used to grind, unlike grinding wheels used at a 30-45 degree angle, they must be used at a 90 degree angle of cut only.

Do not exceed maximum speed

The maximum RPM for any given wheel is clearly stated on its label. RPM is calculated

based on the diameter of the wheel. 80 m/s is the industry safety standard.

Inspect before use

There are many situations that can damage an abrasive wheel. By the time wheels have reached the end user there have been many opportunities for damage to occur, for example in transit. As such, wheels should be visually inspected before they are mounted onto the machine. Damaged packaging is the first sign of a potential problem. If it is known that a wheel has been dropped, it should be discarded even if there is no visible damage, as wheels can crack internally. Likewise, operators should be cautious in how they lay portable machines down when wheels are mounted. Awkward or careless placement can result in chipped edges and you should never use a damaged wheel.

Adhere to dates

Bonded abrasive wheels have an expiry date of three years, dictated by EN12413. The reason for this is because the bond absorbs moisture over time, even when wheel storage is up to scratch.

The expiry date can be found near the bore, either on the label or the metal bushing on the reverse of the wheel. Expired wheels should never be put into use.

Proper PPE

Workers engaged in operations with bonded wheels must be properly protected with goggles, gloves, aprons and dust masks, to protect them in the event of wheel breakage and the expulsion of material from the workpiece.

Abrasive wheels in use on machines can reach noise levels of 85DbA, the upper exposure action value specified in the Control of Noise at Work Regulations 2005, or more. Impaired hearing can result from extended exposure to such levels, therefore earmuffs or equivalent must be deployed.

Don't remove guards

Accidents caused by removing the guards from machines are unfortunately more frequent than one might wish. Guards should never be removed from machines, operators who do so often cite that they



need to get into awkward components. If you are contemplating this dangerous action, a reassessment of your processes is required. For instance, a die or pencil grinder might be a more suitable machine for your needs.

Does your organisation need help with technical specification of abrasive wheels? The Sait Abrasives team are hands-on and ready to assist.

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Noise, dust and vibration emissions successfully reduced during grinding

Claus Genau, head of new product development and the central test facility at manufacturer PFERD, knows only too well how physical strain at the workplace can lead to health-related limitations among employees. He states: "We've been looking closely into the stresses and strains that occur during grinding work and especially at how to reduce vibration, noise and dust emissions and optimise haptic properties, since 2010 under our 'PFERDERGONOMICS' concept."

Over the years, the company has acquired extensive knowledge of how to improve ergonomics. He continues: "This knowledge has permanently changed how we work, think and develop our products. We've been assessing and optimising every PFERD tool with these points in mind ever since, right from the early stages of development. The PFERDERGONOMICS philosophy has produced a wealth of new developments, including several innovations, which solve the problems that PFERD's customers face and are designed to protect users' health."

"The most common causes of work-related illnesses are still noise and dust emissions," explains Claus Genau. In Germany alone, around four to five million employees are exposed to hazardous noise levels in the workplace. The consequences range from hearing impairments through to a long-term incapacity for work. "In this respect, working conditions acts provide the foundation for protecting employees," explains Claus Genau. For employers and their safety officers, meeting these requirements presents an ever-growing challenge. This is because, while striving for economic efficiency and productivity, it is employees and their health and well-being at work that are always the first priority. The result is a situation of seemingly divided interests, for which good solutions are needed.

For this reason, customers are rethinking how they look at things. Before turning to personal measures such as ear defenders to protect users' health, the first step must be to define appropriate technical measures. Claus Genau says: "Before protecting against noise, you need to prevent it from being generated in the first



place. Noise-abating measures within the process itself, for example by using low-noise machines and drives or by adjusting the acoustics in the room, must always take precedence." For this reason, many manufacturing companies are looking for ways to improve working conditions. One early candidate identified for this was the grinding process because it is often very loud and generates dust.

"PFERD conducted intensive research into these fields with PFERDERGONOMICS, and time and time again we were able to identify clear improvements," says Claus Genau. "This was most recently seen with our CC-GRIND ROBUST grinding disc, which produces considerably less noise during use than the grinding wheels used to date. This was also confirmed by noise measurements taken under operating conditions at our customers' premises: noise emissions fell substantially from over 100 to around 94 dB(A) when using a corded angle grinder and from over 96 to less than 89 dB(A) when using a cordless angle grinder."

Similar results were obtained in comparative measurements with a trade association. Claus Genau explains: "Due to its innovative design, the CC-GRIND ROBUST is generally the superior grinding tool in many different aspects, including when compared to the grinding wheel. The

fact that it is constructed on the basis of a glass fibre-reinforced plastic pad makes the tool much lighter and means it is safe, robust and low-vibration during use."

Thanks to the optimised shape of the backer, the tool always makes the ideal amount of contact with the workpiece, which ensures high stock removal and is essential for fast work progress.

Claus Genau continues: "As, technically speaking, this is not an electroplated grinding tool, but rather a coated abrasive, it also causes significantly less dust. Compared to the grinding process using a grinding wheel, the CC-GRIND ROBUST does not have bond and reinforcement elements that significantly contribute to dust creation."

The aggressiveness of the abrasive grit and the optimum contact angle to the workpiece also mean that the material creates less dust.

Claus Genau adds: "Because we produce chips, not dust. So, suddenly we came up with a remarkably simple logic: the larger and heavier the chips, the lower the risk of dust entering the lungs."

Another advantage is how economically the ROBUST grinding discs work. "It's about the stock removal rate and operating speed, but also the heat transfer onto the workpiece," says Claus Genau.

The CC-GRIND ROBUST tools delivered an

impressive performance across the board in the practical tests, so much so that the colleagues who tested the grinding discs said they would like to start using them sooner rather than later.

Manufacturer PFERD was delighted with the good test results and to have received consistently positive feedback on such a high, expert level.

Claus Genau concludes: "These are people who know what they are doing. These opinions are important for us because they prove to us that, with the CC-GRIND ROBUST, we have developed a powerful, state-of-the-art tool that fulfils current requirements and helps employers to overcome the many challenges they face, including in the area of workplace safety."



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A Practical Guide to Precision Grinding



This book has been written for the people who, figuratively speaking, put their noses to the grindstone every day. The book distills what the author, Walter Graf, learned during over 40 years in the abrasive industry: Travelling the industrialized world, optimising customers' grinding processes, and giving grinding seminars.

372 pages, divided into some 20 chapters covering, among others, OD & ID cylindrical grinding, centreless grinding, surface and creep-feed grinding, gear grinding, how to run grinding tests, diamond dressing, giving practical advice on effectively running these processes. Excessive wordiness was consciously avoided and counterbalanced by graphics and simple formulas to make the contents understandable, digestible and actionable.

Anyone wishing a summary of the contents, with the first page of each chapter, please send a request to info@adgrind.com

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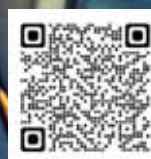


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The dangers of acrylic dust & fumes

What are acrylic dust & fumes?



There are many industries that create acrylic dust and fumes, though the most common include the laser cutting and engraving industry as well as the beauty industry, such as nail salons.

In this guide Purex, the fume extraction specialists, will explore how acrylic dust is made, as well as the risks of inhaling acrylic dust and fumes.

Are acrylic dust and fumes harmful when laser cutting and engraving?

Acrylic transitions from a solid to a gaseous state when it has reached boiling point. Powerful laser beams are used for engraving and cutting by rapidly raising the acrylics temperature. Laser machines work by heating the acrylic, causing the surface to evaporate and leave a hole or deep mark known as engraving. Laser machines can also be used to cut acrylic by probing the sheet with the correct power and speed, which results in quickly cutting the acrylic into the desired shape.

This can cause acrylic vapour, fumes and

dust which can give off an unpleasant odour as well as cause irritation. This can result in some discomfort for those within close proximity, which is why it is advised to use the appropriate fume extraction system.

Are acrylic and dust fumes harmful?

Acrylic dust and fumes can cause the following: Skin sensitivity and irritation; Dermatitis; Allergic reactions; Headaches; Nausea; Dizziness; Prolonged exposure may cause or provoke asthma; Wheezing; Tightness of chest; Irritation to nose, eyes and mouth.

How can a soldering fume extractor help?

As acrylic fumes and dust can be detrimental to employee and customer health, a chemical risk assessment is recommended and employees should observe any warning labels, wear the correct PPE and practice the use of handling acrylic safely.

Correct ventilation is crucial. When natural ventilation isn't sufficient enough,

airborne chemicals can accumulate in the air which can be harmful when inhaled in significant quantities. To ensure chemical vapour, fumes and dust from acrylic is controlled, a fume extraction system such as the 800i 3-Tier, can help to capture these particles and minimise exposure.

The 800i 3-Tier, is designed to remove the harmful odours and fumes, making the environment more comfortable and healthier. The dedicated control, monitoring and display system unique to Purex allows for automatic electronic flow control which maintains a constant extraction rate even if the filter blocks. Users of this fume extraction system can benefit from the simple installation, low running costs and ease of relocation when required.

Fume extractors for soldering fumes

At Purex, our excellent level of service and support, including our 24-hour technical support service, start-to-end projects and response times are unparalleled. Get in touch with our expert team today to find out

more about our fume extractors for a variety of industries or learn more about how Purex can help with your fume extraction needs.

How much exposure to wood dust is dangerous?

While wood dust might seem harmless, it can cause serious health problems if inhaled. In recent years, HSE has updated its EH40 Workplace Exposure Limits (WELs) which sets out the maximum exposure employees should have to a substance in the workplace. In this guide, we'll explain the potential dangers of exposure to wood dust in the workplace and outline how to combat it.



What is wood dust?

Wood dust, also known as sawdust, is created when machines or tools are used to saw, cut, plane, shape, or sand wood. Wood dust is present in all stages of woodworking and in particular in businesses such as sawmills, furniture-making, cabinet-making and carpentry.

What are the dangers of wood dust inhalation?

The risks associated with wood dust inhalation depend on a number of factors such as the length and intensity of exposure and the type of wood being processed. Generally, at a minimum, wood dust is likely to irritate the eyes, nose and throat and can cause coughing and difficulty breathing. Exposure to softwood is known to be less dangerous than hardwood but can still cause irritation and illness. Some hardwoods like oak, mahogany and beech all have been associated with an increased risk of developing respiratory irritation and health conditions including:

Occupational asthma: Studies show that prolonged exposure to hardwood dust has been linked to the development of occupational asthma.

Nasal and sinus irritation: Not only can hardwood dust cause irritation to the nasal passages and sinuses but in some cases it can develop into chronic sinusitis.

Allergic reactions: Continued exposure to hardwood could potentially cause allergic reactions in some individuals, like rashes and hives. In severe cases it could even cause anaphylaxis.

Nasal cancer: Tropical hardwoods have been associated with an increased risk of developing nasal cancer. This is rare but does have the potential of being serious when it occurs.

Updated wood dust exposure limits

Both hardwoods and softwoods are considered dangerous when inhaled in large quantities, which is why the HSE has established WEL limits which must not be exceeded.

The exposure limits are as follows:

Hardwood: 3 mg/m³, based on an 8-hour time-weighted average.

Softwood: 5 mg/m³, based on an 8-hour time-weighted average.

Mixtures of hard and softwood: 3 mg/m³, based on an eight-hour time-weighted average. It's important to remember that the WEL limits serve as a minimum limit level and the level of dust should be kept as low as reasonably possible.

How can Purex help?

Here at Purex, we have over 30 years of

experience in supplying fume and dust extraction over a wide range of industries. Our connections in the industry mean we're equipped to recommend the wood and heavy dust extraction that's best suited for your needs. And what's more, our qualified technicians are able to install and set up your LEV system for you. Our high level of service is why we're known for our quality LEV testing. We'll test any LEV system for you, even if it's not a Purex model.

For more information on how we can help, contact our helpful team today. Or if your current LEV system needs servicing, easily book your next LEV test with our team.

Purex has over 30 years of supplying fume extraction solutions unlike any other in the industry. An expert in its field, Purex is renowned for the quality and reliability of its technology and unrivalled customer support.

We pride ourselves with offering excellent customer service, product availability, timely shipping and technical support. Purex is continually developing new features to deliver the most efficient and safety conscious equipment in the market. We have intelligent fume extraction products for various applications including coding/marketing, laser engraving, printing, light industrial and electronics assembly.

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Dust challenges in the food industry and how to solve them



The food sector is one of the largest industries in the world, responsible for providing sustenance to billions of people every day.

It plays a significant role in the global economy and importance can be attributed to its contribution to economic growth, employment and food security. As demand for food products continues to rise, there are increasing opportunities for growth and investment in the food sector especially in developing countries. However, the sector also faces several challenges, including the need to ensure food safety and quality, manage environmental impacts to ensure the sustainable growth and development of the food sector.

Like any industry that involves manufacturing and production, it also poses certain risks to the workers and the environment. Two significant hazards in the food industry are poor hygiene and combustible dust, both of which can have severe consequences if not adequately addressed.

Maintaining proper hygiene is essential in the food industry to prevent the spread of illness and disease. Contamination of food products can occur through various means, including improper handling, inadequate cleaning of equipment and surfaces and improper storage of raw materials and finished products.

This can result in the growth of harmful bacteria, viruses, and other pathogens, which can cause foodborne illnesses. To prevent the spread of illness and maintain hygiene in the food industry, manufacturing

plants must implement appropriate procedures and practices. These include regular cleaning and sanitising of equipment and surfaces, proper storage and handling of raw materials and finished products and employee training on good hygiene practices.

Food processing plants are also known to generate large amounts of combustible dust, which can pose significant fire and explosion risks if not handled properly. Combustible dust is defined as a combustible particulate solid that presents a fire or deflagration hazard when suspended in the air. In food processing plants, common sources of combustible dust include flour, sugar, cocoa powder and various other food powders and particles. When a combustible dust is suspended or dispersed in the air, inside an enclosure such as a dust collector or walled processing plant area and the dust comes in contact with an ignition source such as a spark or flame, a dust explosion is possible and can cause catastrophic loss of life, injuries and destruction of the facility.

Nederman provides a range of products and systems, designed to effectively capture, contain, and control dust in the food industry for hygiene and ATEX environments as per EN, ATEX and NFPA compliances.

Dust collection systems

Nederman offers ATEX complaint dust collection systems that are designed to safely capture and remove dust particles from the air. These systems utilise various

filtration technologies such as bag filters or cartridge filters, to ensure efficient dust removal while minimising the risk of explosions.

Extraction arms and hoods

Nederman manufactures extraction arms and hoods for use in specific ATEX zones to capture dust directly at the source. These devices are flexible and can be adjusted to reach the dust generation points, effectively preventing the dispersion of dust particles into the surrounding atmosphere.

Explosion protection systems

In environments where there is a risk of dust explosions, Nederman offers explosion protection systems that isolate or suppress the effects of an explosion, protecting the facility, machinery and employees. These systems typically include explosion vents, isolation flap valves, abort gates rotary airlocks, flameless ventilation spark detection/spark quenching systems and chemical isolation/chemical suppression safety systems.

Nederman smart systems

The smart systems support energy savings, automate, optimise cleaning processes, enhance operational efficiency and provide real-time monitoring and data insights for more competent facility management. In the event of a dust explosion, the smart system will follow ATEX and NFPA standards for shutting down the system, including sending alerts and messages to managers so quick responses can be made.

Overall, the management of combustible dust in food processing plants is a complex and challenging task that requires a proactive and holistic approach. By implementing appropriate engineering controls, training and monitoring procedures, plant operators can reduce the risk of fire and explosion and ensure the safety of their employees and the surrounding community.

Nederman Ltd

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Celebrating 30 years



AirBench Ltd is celebrating 30 years in business as of September 2023. From small beginnings as a dust and fume extraction contractor named WorkPoint Environments, through a name change, various premises changes and steady growth in team numbers, AirBench remains the company to talk to for downdraught extraction expertise.

It remains a family owned and run business, although the team has grown significantly and the range has broadened to include cross-draught systems and booths, two ranges of coolant mist filters and air cleaning systems.

The extended dealer network across the EU, Asia, and Australia means AirBench products can be found in a huge range of manufacturing facilities worldwide, from mines in Australia's northern territory, through power generation companies in Hong Kong, to various small manufacturers within a few miles of the AirBench main production facility in Colchester.

As always, the company continues to offer on-site demonstrations of its products across the UK including assessments of your dust or fume extraction issues. Contact AirBench if you have a problem that it can help you solve.

AirBench is one of the UK's leading manufacturers of dust, fume and mist extraction equipment.

All of its dust and fume extraction systems and filtration products are built to order in its factory located in the East of England. All products are assembled from stock components allowing it to maintain short lead times. It also imports the AOF range of oil mist filters from its trusted partners in the Netherlands.

AirBench specialises in high air volume, low velocity extraction systems, providing a demonstrable working extraction solution to a wide range of dust and fume problems.

It demonstrates its extraction systems on site prior to purchase



where possible, to ensure both buyers and operators are confident that its products are the correct solution and are usable in day-to-day operation for their businesses.

The company provides dust and fume extraction solutions to specific workplace problems using standard modular components and filtersets allowing rapid delivery and has supplied over 10,000 AirBench downdraught benches to customers in the UK and worldwide.

In 2014, it purchased the OMF range from Air Cleaning Systems of Cardiff following their entrance into liquidation. This helped to broaden AirBench's coolant mist filtration product range and to provide ongoing support to Oil Mist Filters (OMF) customers.

It also distributes the AOF range of mist filtration units, which are manufactured for its Netherlands-based partners Dormatec. Its extraction systems are generally self-contained: AirBench, downdraught benches, usually requires no installation; VertEx, its range of cross draught booths, can be installed quickly in-house and its OMF products can usually be fitted in less than one day by its trained teams.

AirBench Ltd

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Honing quality is always in view thanks to scan function

KADIA equips honing machines with “scanning of the drilling”

High-precision honed bores require careful quality control. On all KADIA honing machines, this task is solved by “scanning the bore” directly after the honing operation. The result of the machining operation is always kept in view. In addition, the scans say significantly more about the quality achieved than conventional measurements.

When honing precision components, each honing station is usually followed by a measuring station (Fig. 1). This makes it possible to perform hundred-percent measurements. Hole Bore diameter and shape can be continuously readjusted in a closed control loop if required. The usually multi-stage process gains in stability and reliability. Normally, the air plug gauge air



Fig 1: Sequence of honing and measuring station in a multi-spindle transfer honing machine. The interior of a highly productive honing machine in transfer design. Each honing station is followed by a measuring station. With the captured processing results, it is possible to keep the honing quality within an ideal range via a control loop.

measuring probe travels to several measuring planes, for example three or five, depending on the bore length.

“We take this a significant step further and scan the bore over its entire length,” explains Dr.-Ing. Uwe Moos, responsible for fundamental development and honing technology at KADIA Produktion GmbH + Co. in Nürtingen. “Scanning also means that the air plug gauge records up to 500 diameter values per millimetre of measuring travel and transmits them to the control system.” KADIA introduced this function for all honing machines, from the single-spindle Eco series to the multi-spindle transfer

system, four years ago, a world first at the time.

At its core, the solution consists of intelligent software that KADIA integrated into the HMC100 machine control system it developed itself. No special scanning hardware is required. Measuring probes are used as in conventional measuring, but the requirements for measurement data capture and preparation are extremely high. In the high-precision segment in which KADIA operates, it is not uncommon that half a thousandth of a millimetre determines the usability of a component.

For the honing experts from Nürtingen, bores with diameters of 60 mm are already very large and located at the upper end of the portfolio. Far more frequently, smaller bores are machined on KADIA machines. Suitable measuring probes are standardly available down to $D=2.5$ mm. Specialised probe versions are available for even smaller diameters. The usual measuring ranges in this segment are typically ± 20 μ m for intermediate honing and ± 10 μ m for finish honing.

Scanning is carried out simultaneously

“Years ago, a separate measuring computer would have been necessary to handle the amount of data generated during scanning. Today, however, our control system allows the scanning process to be carried out practically on the side,” says Uwe Moos. The high-performance computing module of the HMC100 graphically displays the many values in a fraction of a second (Fig. 2), even on machines with multiple measuring stations. Users have many options for visualising the measured value progression of the scans. They can display an individual operation or the entire process, for example, to review the machining progress. “Due to the high performance of the control system, the scanning process is executed without affecting the cycle time,” emphasises the developer.

Compared to the conventional measuring method with fixed planes, the scan function offers a whole range of advantages: it allows measurements up to 1 mm away



Fig. 2: Control panel of the HMC100 honing machine control system from KADIA. The display visualises the entire honing process, including the process states of the operations, the measurement results and the cutting forces.

from the bore edge. With conventional measuring systems, at most 2.5 mm is realistic. In addition, the software is able to classify measured values, i.e. it can distinguish between areas where the honing tool has been actively engaged and where it has not. It can also detect cross bores, notches or pockets, as well as defects in castings or pre-machining grooves. Bore interruptions generate implausible measurement data, which are detected and sorted out by the software so that they are excluded from further processing. As a result, there is no need for positional orientation of the workpieces. And since the areas being measured are recognised automatically, the handling effort is also minimised.

If a bore has many interruptions, it is not uncommon for only very narrow lands to remain. With standard measuring equipment, the scanning function detects lands with a length of 2 mm and with specialised measuring equipment, even lands with a length of 1 mm. “By capturing a large number of measuring values and taking the entire geometry of the bore into account, scanning offers higher reliability than measuring on a few planes,” affirms Uwe Moos.

Deformations become visible

The scanning function reveals its strengths particularly in the case of workpieces with small wall thicknesses or irregular outer contours. Where there is little material, elastic deformations almost always occur during machining. Experts refer to this as "breathing of the workpiece". The material yields more to the cutting pressure at these points than at others. In these cases, scanning provides maximum transparency: it makes the problem areas visible and gives users hints on how to adjust their process parameters.

Example gear wheel

Typical applications are found in vehicle manufacturing, an example being planetary gears for electric vehicle transmissions (Fig. 3). Such a component has a length of 90 mm and features a through-bore to be honed with $D = 25$ mm. There are no bore interruptions, but the outer contour



Fig. 3: Application example 1 - Planetary gear for electric vehicle transmission with through hole to be honed. Components like this one very often show different elastic deformation during machining due to uneven material distribution.

presents a diameter jump of 70 mm. There is a recess at the transition, so that only a wall thickness of 2 mm remains in this area. The elastic deformation that occurs at this point during machining is reflected in the measurement data of the scan as a constriction (Figs. 4a, 4b). Consequently, there is a risk that the machined diameter at the recess height will be smaller than the lower tolerance limit. For process stability, however, it is of fundamental importance to know and locate the smallest diameter precisely. In this respect, scanning the bore provides the most reliable information. The HMC100's software divides the bore length into evaluation areas; in this example there are seven. Each area is displayed as a coloured bar, clearly visualising the constriction. This provides the machine operator with important information for

taking measures to compensate for the deformations. Possible adjustments include, for example, adapting the feed steps for the cutting operation or changing the stroke reversal points. After the first honing operation (Fig. 4a), the constriction at the height of the recess is still very pronounced (level 5). After the second operation, the profile is clearly flattened (Fig. 4b), the depth of cut during this operation is lower, so the material deforms less and the previously seen constriction can be partially removed. The important thing is that the black profile line must lie within the tolerance of the target diameter, the part is then classified as "OK" for the next machining station and can remain in the process.

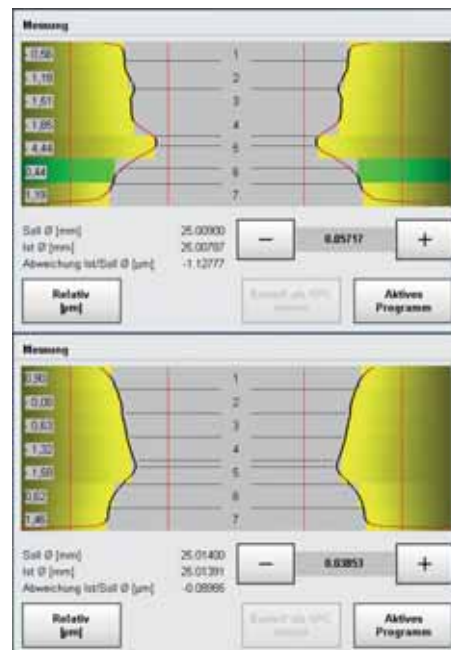


Fig 4a, b: Measurement plot for the gear wheel after operation 1 and 2. Comparison of two machining operations: The elastic deformation is relatively pronounced after that of the first operation, with a maximum diameter difference of $5.63 \mu\text{m}$ (Fig. 4a). The second operation smooths the profile noticeably, and the maximum diameter difference is only $3.04 \mu\text{m}$ (Fig. 4b). The vertical red lines mark the permissible deviations from the target diameter, i.e. the maximum and minimum dimensions of the hole. After the second operation, a tolerance width of $12 \mu\text{m}$ is permissible for this component, so that only about a quarter of the tolerance is used.

Example of a hydraulic part

A second real-world example, a technically sophisticated sleeve, can be found in the hydraulic unit of an automatic transmission developed for a high-end sports car. The bore to be honed has a diameter of just 6 mm and is 57 mm long. Key feature: the



Fig. 5: Application example 2, hydraulic part. A technically sophisticated hydraulic component with blind bore and numerous cross bores for a sports car automatic transmission.

sleeve has numerous cross bores or control openings for the hydraulic medium. In addition, it is closed on one side except for a small opening. This means that there is a blind bore for the honing tool. This is a challenge, because the clearance for the tool to over-travel is relatively short at around 3 mm, so the reversal point can only be set in a very limited range. Due to several cross bores, there are also differences in the wall thickness, which in turn promotes elastic deformation.

In this example, the advantage of the scan function's automatic edge detection comes into play above all. For a measurement using conventional means, precise positioning of the workpiece would be an absolute requirement and, moreover, very time consuming. As conventional measuring methods require a larger edge distance, it would only be possible to determine diameter values in a few locations on the bore wall at all. Statements about dimensional accuracy would be

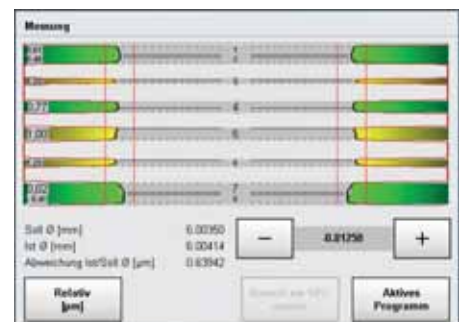


Fig. 6: Measurement plot for the hydraulic part as an example. This component shows the great advantage of scanning: The cross bores or edges are detected automatically, so the user receives reliable diameter values over the entire bore length.

rendered unreliable. In contrast, the chart showing the measurement data progression (Fig. 6) illustrates that the scan function provides many valid data points and therefore reliable results.

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How honing is a key element of Formula 1



Honing is a precision machining process that plays a crucial role in many areas of manufacturing and industry, but there are few applications more demanding than Formula 1. Unlike the engines used in conventional cars, F1 engines are exposed to extreme pressures and stresses that take them to the brink of what internal combustion engines are supposed to do.

Components within an F1 engine can spin up to 20,000 times per minute, while the internal pressure can reach 1,500 psi a second. Nevertheless, Formula 1 cars must deliver exceptional and reliable performance to optimise the chances of victory and minimise the risk of mechanical defects and failures.

In this article, Hone-All explains how it uses honing to ensure highly functional surfaces on engine components to improve engine power, reduce friction and enhance reliability, durability and consistency; all of which are vital in the high-stakes world of motorsport.

Optimising engine power and performance

In terms of engine power and performance, honing is used to achieve extremely precise cylinder bore dimensions. By doing so, the piston rings can form an effective seal against the cylinder walls, mitigating blow-by the escape of combustion gases past the piston rings and maximising

compression. The meticulous sealing process is imperative to achieve optimum combustion efficiency which ultimately contributes to enhanced engine power output.

Reducing friction

The reduction of friction is a key factor in the efficiency and durability of F1 engines. By creating a flawless surface finish on the cylinder walls, honing promotes oil retention and effective lubrication between the piston rings and the walls. This reduces friction and minimises wear, enabling the engine to operate with improved efficiency and reduced energy loss. Consequently, the engine not only performs to its best but also maintains its longevity even under the extreme conditions of the racetrack. Securing reliability and durability. Reliability and durability are fundamental in Formula 1 motorsport, in which engines are subjected to extreme of temperature, pressure and force. Proper honing techniques play a key role in the manufacture of robust and durable cylinders that are able to withstand demanding conditions. The precise honing process ensures that the engine components function optimally and minimises the risk of failures during races.

Achieving consistency

Consistency in honing is not only critical for engine reliability but also for achieving consistent performance. A balanced engine is key to smooth operation and reduced vibration, resulting in a more predictable and controllable driving experience. Formula 1 teams rely on honing to fine-tune engine performance, ensuring that each

cylinder contributes uniformly to the power output and overall efficiency of the engine.

Honing experts

At Hone-All, honing was the foundation of its highly successful business and is a key service that it offers its customers, utilising the latest CNC technology to achieve outstanding results for a cost-effective price.

Decades of honing expertise continues to be enhanced through its investment in the latest CNC technology enabling much higher stock removal, while maintaining the exacting quality standards of surface finish and geometry on which its excellent reputation has been built.

Hone-All specialise in manufacturing high precision, tubular components by utilising the latest in deep hole boring, gun drilling, turning and honing technology.

It provides a wide variety of industries with a complete service from sourcing raw materials to producing finished components up to 3 m long.

All procedures are carried out within its own facilities, ensuring that it continuously improves controls over cost, quality and lead times. It provides the most competitive rates and a faster, more efficient service.

Its culture is one of a family business with the emphasis on approachability, teamwork, communication and co-operation, with an open policy on management and business strategy that invites the support of every member of the Hone-All team.

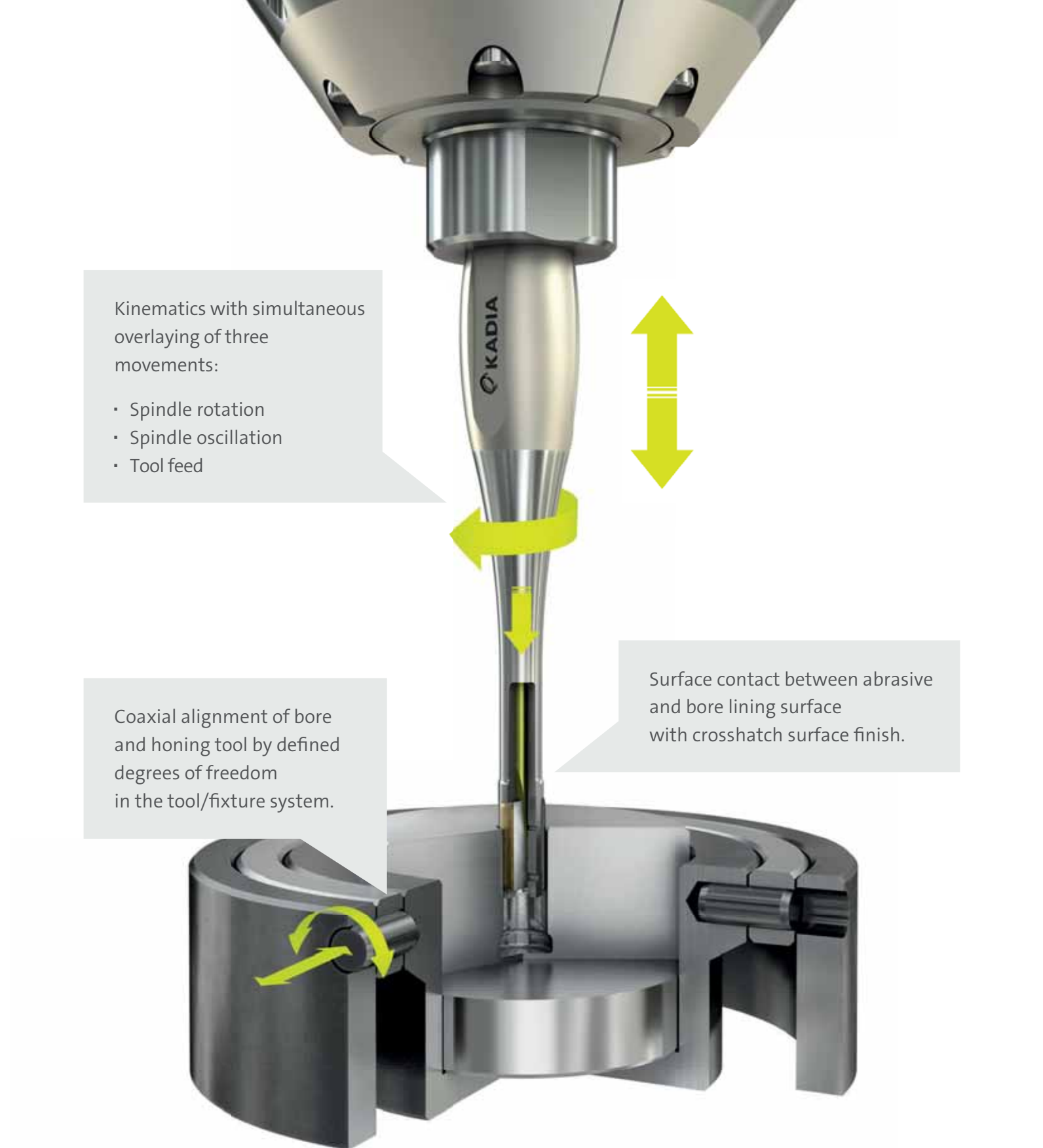
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Kinematics with simultaneous overlaying of three movements:

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- Spindle oscillation
- Tool feed

Coaxial alignment of bore and honing tool by defined degrees of freedom in the tool/fixture system.

Surface contact between abrasive and bore lining surface with crosshatch surface finish.

WHAT IS HONING?

Animation film on our KADIA YouTube channel.

www.kadia.com

 **KADIA**

Gehring pushes tube honing as a complete package with the deephone machine series



Gehring supplies deephone machines for large precision tube components with stroke lengths of 2-10 m. Internal and external machining is possible. The Gehring operator panel supports the operator with intuitive menu guidance.

With the deephone series, Gehring Technologies GmbH + Co. KG offers horizontal honing machines for a wide range of large components. At EMO, the Ostfildern-based company presented new developments and features in this segment. These enable demanding and complex machining processes to be carried out even more cost-effectively.

"At this year's EMO, we want to show potential customers at our stand that we can offer a complete package for honing large workpieces from a single source with our machines, tools and process know-how," said Marcell Wardin, director of sales & marketing at Gehring. "This package includes a wide range of precision tube components. These include, for example, cylinder liners for the hydraulic industry, aircraft landing legs, ingot moulds and even radio masts."

Gehring has developed the deephone machine series for precisely these applications. Stroke lengths range from 2,000 to 10,000 mm, internal machining up to 1,200 mm and external machining up to 300 mm are possible. "An important feature of these machines is their flexibility," added Marcell Wardin. Indeed, a three-stage gearbox makes it possible to machine a wide variety of workpieces on one machine. Depending on the size of the workpiece or the removal rate, the power requirement changes. The three-stage gearbox provides the necessary adjustment. Without such a component, it may be necessary to distribute different workpieces among several machines or to reclamp demanding workpieces. With a complete package from a single source, investment costs can be reduced. Double infeed, push/pull, allows roughing and finishing with a single tool.

Gehring also equips the machines with a control system for conical honing. This allows workpieces such as moulds to be machined with greater precision. Optionally, a counter-rotating drive can be installed to further increase cutting performance and improve bore geometry.

A special feature is already familiar from conventional honing machines: compressed air measurement. In tube honing, this feature is less common due to the smaller quantities involved. Air gauging allows the diameter to be checked during the process, provided a suitable tool is available. Without air gauging, the operator must stop machining and remove the tool from the deep hole. He may also have to clean the hole before measuring, an enormous waste of time. With air measurement, the machine operator has a clear advantage.

Gehring also offers highlights in the field

of tools. In principle, all tools can be adapted to the deephone machines as a machining company with a large tool stock has all the options. Nevertheless, the Ostfildern-based company has added a new DH tool series to its range. The special feature of these tools is their internal cooling system, which has long been standard in other machining tools. The coolant reaches the machining point with pinpoint accuracy, which benefits tool performance and quality. The internal cooling not only supports chip formation, but also flushes the chip-oil mixture out of the machining area, preventing chips from sticking to the honing stones. "We expect our new internally cooled tools to reduce machining time by 20-30 percent and reduce the need for coolant," said Marcell Wardin.

The tools are designed for both ceramic and diamond cutting edges, allowing a wide range of application adaptations. In the tool body, a linear infeed ensures accurate bore dimensions. This design is particularly low vibration. Less vibration means not only lower noise levels, but also greater process reliability, which in turn means high-quality and improved metal removal rates. The bottom line is a further reduction in machining time. The user also saves time



BU: Gehring has a new generation of DH tools for tube honing in its program. An important feature is the internal cooling.

thanks to the bayonet connection, which makes it possible to change tools in no time at all.

Visitors to the Gehring stand were also able to see a Deephone machine and the specially developed DH tooling system. Marcell Wardin concluded: "We are very well prepared. Our experts on the stand will be happy to explain the performance of our complete package for special honing applications."

With over 90 years of experience, Gehring develops, among other things, technologies for highly efficient conventional and electrified powertrains. With its laser roughening, coating and honing processes,

the company offers innovative solutions for combustion engines in response to current requirements of the automotive industry. Production technology for electric motors complements the portfolio and sets the tone for the future direction of the company. As a worldwide company, the Gehring Group is globally represented in key markets of the automotive and supplier industry, hydraulics and pneumatics, as well as aerospace technology.

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Kemet advance spherical lapping and polishing with new generation of bench top machines

Leading surface finishing engineering company, Kemet International recently launched new generations of its benchtop spherical polishing machines.

The KemiSphere II, a compact, single-station spherical lapping and polishing machine, designed to flawlessly match two spherical forms or, when equipped with the appropriate tooling, achieves the precise spherical geometry to less than 5 µm roundness and a pristine mirror finish. This versatile machine serves as a seamless replacement for traditionally labour-intensive hand lapping processes and is well-suited for integration into any workshop involved in spherical lapping.

The machine, which provides a cost-effective and consistent method for processing spherical forms to a required surface finish, is capable of handling a wide range of materials for individual component lapping or precise form matching. The KemiSphere II's user-friendly (HMI) enables the storage of component-specific programmes, including drive speeds, sweep angles, process times and pressures. Additionally, Kemet offers process validation in its testing labs, providing comprehensive data and samples for

enquiries, ensuring each machine arrives pre-programmed and ready for immediate use, regardless of the application.

An impressive range of features includes three motors with individual speed control, a Siemens PLC and HMI for repeatable results, a precise pressure application system, and a compact benchtop design. Effortlessly handling components up to 100 mm in diameter its user-friendly interface allows programmable sweep initiation and termination points, one-button process initiation and simplified machine setup through manual and jog functions. CE marking confirms compliance with safety and quality standards and it efficiently operates on a 230V single-phase 50 Hz power supply.

Kemet offers a selection of square polishing pads tailored for the KemiSphere. Sphericloth Polishing Squares, with cutting-edge flock length technology, facilitating an enhanced polish flow to the pad's surface during the polishing cycle resulting in an exceptional level of surface polish quality.

The KemTech SpheriMatch II is the ultimate solution for automating the match lapping of two valve halves or similar components, ensuring a perfect match between concave and convex surfaces, such as the barrel of a hydraulic piston pump and its swash plate. These matching radii are vital for maintaining performance and minimising leakage. The



SpheriMatch II is capable of removing even deep scoring and performing the final match lapping of bodies ranging from 75 mm to 250 mm in diameter and up to 300 mm in height.

Four specialised versions cater for various needs.

The standard model boasts a 250 mm chuck with variable speed control, a servo-controlled sweep arm, customisable start and finish points, a cantilevered pressure weight system and a 4.3" Unitronic HMI and PLC.

The SpheriMatch II+ elevates performance with an abrasive stirrer and WM FD114 Peristaltic Pump.

The SpheriMatch II Driven maintains standard features but adds a driven head for improved efficiency.

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The Science behind

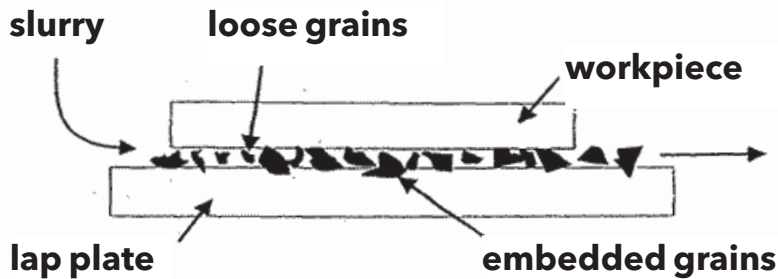
Lapping, Polishing, Grinding and Honing

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What is spherical lapping?



Lapping involves the cutting and shearing action of loose abrasive particles and the fine grinding of abrasive particles embedded in the lap plate

The term "lapping" is used to describe a number of various surface finishing operations where loose abrasive powders are used as the grinding agent at normally low speeds. It is a process reserved for products that demand very tight tolerances of flatness, parallelism, thickness or finish.

One or more parts are machined at the same time in a batch process. The abrasive is usually mixed with a liquid vehicle, either oil or water based. The pieces being lapped are captured in retaining rings.

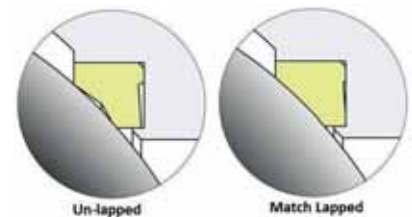
Workholders also called "carriers" may be used to keep the parts separated to prevent damage to their edges. The parts are dragged across the lap plate surface on to which the abrasive is being fed.

Lapping is an averaging process where the greatest material removal occurs where the high points of the surface of the part contact the flat lap plate. The object is to produce parts with a uniformly smooth and usually flat surface. A surface that has been lapped exhibits a dull, non-reflective and multi-directional appearance. This condition is referred to as "matte" finish. There may be slight reflectivity on materials lapped with very small micron size aluminum oxide abrasive. This is especially true if the material is relatively hard and the surface roughness measurement is perhaps 5 (.127 micron) micro-inch and below.

Very light "micro-scratches" may be viewed on lapped surfaces. Abrasive of larger micron size and harder compound will generate more micro-scratches in addition to deeper scratches. Most micro-scratches produced with small micron aluminum oxide abrasive will be less than .000001" (.025 micron) deep and can't usually be measured with a

profilometer. Micro-scratches should not be confused with deeper scratches produced by particles of contamination or other causes.

Lapmaster spherical lapping machines and systems offer a complete line of products for all spherical lapping requirements. The company can offer fully integrated systems and machines for high volume spherical lapping and industrial production applications and equipment for low volume job shop applications. Lapmaster also offers used spherical lapping, rebuilt and refurbished and upgrade services for existing spherical lapping machines. It provides customers with fully engineered complete custom solutions and offers a full line of accessories and consumables in addition to



comprehensive training and repair services.

Its extensive line of spherical lapping machines and systems for both medium to large-scale serial production as well as small batch production can be made to be manually operated or fully automated. With innovation and customer service as its main objectives, Lapmaster is continuously researching and developing new technology and spherical lapping machinery. By consistently staying on top of the latest developments on the market, it ensures that its customers are provided with the most state-of-the-art production and control.

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DeburringEXPO 2023

Distinguished by outstanding quality



Numerous exhibitors from all exhibition segments presented new and further developments, which met with great interest amongst the visitors. The opportunity of experiencing them live and discussing possible applications for individual tasks generated considerable enthusiasm.

Nearly all of the more than 1,200 expert visitors arrived at this year's DeburringEXPO exhibition in Karlsruhe, Germany, with specific tasks and strong demand for information. For the majority of the 107 exhibiting companies from 13 countries, this resulted in excellent contacts and new projects with good prospects for post-event business. With more than 500 participants, the bilingual expert forum also lived up to its reputation as a coveted source of knowledge.

Deburring and the production of precision surface finishes are just one aspect of surface treatment technology. But due to quality and cost considerations, manufacturing companies are focusing on them to an ever greater extent. 20 percent of the event's visitors came from outside of Germany and 18 countries were represented. The largest percentage of

visitors came from Germany, followed by Switzerland, Italy, Austria and Slovenia. "The fact that participation at the trade fair paid off for the exhibiting companies is more important than the figures themselves," notes Hartmut Herdin, managing director of private trade fair promoters fairXperts GmbH & Co. KG.

Significant contacts promise good post-event business

Steffen Hedrich, managing director of Kempf GmbH says: "Practically every visitor at DeburringEXPO comes to the trade fair with an ongoing problem for which they require a solution. As a result, discussions go into great depth very quickly. We also presented a world's first for deburring tasks which place stringent demands on chamfer quality and it generated significantly better feedback than I expected beforehand. For us

it's already clear that we'll exhibit again in 2025." The fact that there was so much tangible action at DeburringEXPO was due to the very high proportion of expert visitors. The most prominently represented sectors included machinery and systems manufacturing, metalworking and metal processing, medical and pharmaceuticals technology, tool and mould making, precision engineering and optics, the automotive industry, as well as aviation and aerospace technology. Roughly 92 percent of all visitors are involved in company investment decisions. The quality of the contacts and RFQs is correspondingly good, which were fielded at the event by a majority of the 107 exhibitors from 13 countries.

"We took over the business from another company that exhibited at the trade fair on a regular basis and were thus also on hand

this year. We were surprised by the highly specific tasks and RFQs and by the resulting quality of our leads. I think we'll exhibit again at the next DeburringEXPO," reports Shigeru Kajisaki, managing director of Yamazen Europe GmbH. Dieter Münz, managing director of Ultratec Innovation GmbH, is also very satisfied with the way things went at the trade fair: "DeburringEXPO is our most important trade fair. You don't have as many visitors as you do at the big metalworking events, but they all come with a specific task in mind. As a result, the success rate for good post-event business is significantly higher here than at other trade fairs. This is why we will definitely be back in 2025."

David Bartels, laboratory manager responsible for process engineering sales at Höckh Metall-Reinigungsanlagen GmbH was also very positive: "Deburring is one of the major topics at DeburringEXPO

and cleaning is an upstream or downstream production step. The joint trade fair presentation with SGM has resulted in synergies that have enabled us to generate more interesting leads than at previous events, including numerous new contacts." Patrick Taschek, sales and project engineer at Rösler Oberflächentechnik GmbH, recalls very detailed discussions and RFQs: "During the three days at the trade fair, we were visited by existing customers with whom we were able to discuss new projects. On the other hand, we were also able to establish good new contacts. Our meetings frequently focused on reducing the number of manual processes, as well as simplifying and automating processing operations."



The automation of deburring and surface finishing processes was one of the dominating topics at this year's DeburringEXPO. The exhibitors presented a variety of alternatives to this end.

Jan-Niklas Merkel from the technical sales department at SHL AG also discovered that the trend towards more automation, which is not least of all due to the shortage of qualified personnel, was a dominant theme at this year's DeburringEXPO: "The visitors came from various metalworking sectors with different tasks for deburring and the production of precision surface finishes. We observed that the requirements for automation solutions are becoming more demanding and that greater degrees of automation are required."

High levels of visitor satisfaction thanks to numerous innovations

The fact that the leading trade fair for deburring technologies and precision surface finishing lived up to the

expectations of the visitors as well is made apparent by the evaluation of the visitor survey. Roughly 95 percent were satisfied or very satisfied with the trade fair offerings. Without a doubt, the numerous new and further developments presented by the exhibitors contributed to the high levels of satisfaction. Further evidence of visitor satisfaction was shown in the recommendation rate. More than 75 percent would recommend a visit to the leading trade fair as an information and procurement platform to colleagues and business partners.

Coveted source of knowledge

Right from its very first edition, the bilingual expert forum at DeburringEXPO has established itself as a coveted source of knowledge. 505 participants took advantage of the simultaneously interpreted presentations (German <> English) at this year's event in order to deepen their knowledge of deburring technologies and the production of precision surface finishes. For more than 30 percent of the visitors, the programme schedule for the expert forum was the decisive factor for selecting the day on which they visited the trade fair.

The next DeburringEXPO will be held at the Karlsruhe Exhibition Centre from the 14th -16th of October, 2025.

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www.deburring-expo.de



The bilingual expert forum with a total of 23 simultaneously interpreted presentations, German <> English, attracted more than 500 participants who sought new knowledge and expanded their know-how.

Stetec demands efficiency in finishing precision sheet metal work

Last year, 600,000 products passed through the Timesavers machine at Stetec in Maarheeze. No wonder efficiency is paramount at the maker of precision sheet metal made from aluminium, steel and stainless steel in thicknesses from 0.3 to 5 mm. Commercial director Sebastiaan Vriesema says: "We can choose very specifically for each product to be finished which treatment fits best."

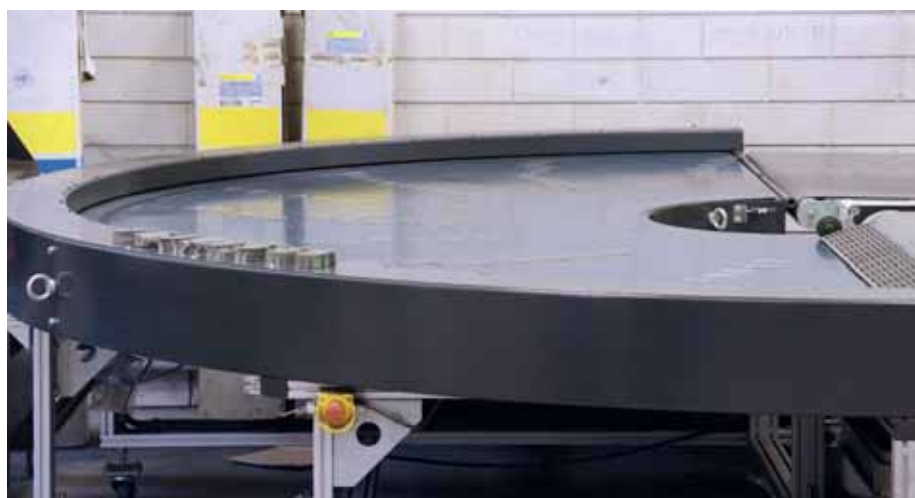


Commercial director Sebastiaan Vriesema, Stetec

Stetec's customer base is very diverse. For example, the company produces thin precision sheet metal for laboratories and hospitals, but also for car parks and amusement parks. Or a 19" rack used at film studios for camera footage. "Mainly in the Benelux, but we can also take care of their branches in the rest of Europe," assures Sebastiaan Vriesema, who has been a board member at the Maarheeze-based company since this year. He shows one of the punch laser combination machines linked to an automatic warehouse. In addition, Stetec has a bending department, a pressing department, automatic or manual and space for smaller operations, such as stud welding and spot welding. He continues: "Very importantly, we also take care of the logistics process and the posttreatments that a customer needs from us."

Reliable

What is striking about the production hall is that there are almost only A-brand machines. Sebastiaan Vriesema explains: "It's not that we consciously only choose A-brands. We are constantly looking for machines that fit our requirements and that are necessary for successful production. Crucial in this is that the supplier is reliable: good maintenance, good service and a good point of contact. We don't buy a machine



purely by name; we buy by quality, service and functionality of a machine."

Deburring

Reliability is thus another reason why Stetec purchased a Timesavers 42 series with eight rotary brushes. This 42 RB series can evenly deburr and round the edges of metal with its multi-rotating brush assembly. This makes it possible to achieve a radius of 2 mm on mild steel and even more on softer material such as aluminium. One of the big advantages of the Timesavers is its wide belt of 1,350 mm. This allows many small products to pass through the machine at the same time. Sebastiaan Vriesema says: "Last year, we had 600,000 products finished by the Timesavers. You can imagine how important efficiency is then."

Flexible

The machine is equipped with a proper sticky conveyor and vacuum as standard. It is available in different configurations for combining deburring, edge rounding, laser oxide removal, finishing and even slag removal. Each aggregate can be used separately. Sebastiaan Vriesema adds: "An important reason was the ability to combine the techniques of grinding with the abrasive belt and rounding with the rotary brushes. We can choose very specifically for each product to be finished and which treatment fits best: only grinding, only brushes, or combining both techniques."

An AMI return feed table is connected to the Timesavers. The return table makes it possible for one person to put the products on and also take them off, without walking back and forth all the time. Sebastiaan

Vriesema states: "It's an efficiency gain. This is very important for us; we are constantly improving our process, we have to."

Durable

For deburring, the minimum thickness is 0.3 mm and the maximum thickness 5 mm. Sebastiaan Vriesema knows it is no problem for the Timesavers. "Before we bought this machine, we had another Timesavers. That was a wet finisher. We were satisfied with it. The introduction of the new brushes and grinding was an additional reason for us to choose Timesavers again. The move to a dry process was an important development for us and the machine seems very durable. We only had to replace the first brush set after four years, when the R+ brushes came on the market."

Simple machine

Bert, an operator at Stetec, confirms Sebastiaan Vriesema's story. The machine operator mainly works with the punch laser combination machine and also operates the Timesavers. "An easy machine," he says. "A big advantage is the width, connected to the return table. We process a lot of products and then you need to be able to



easily set the deburring machine and know that there is little downtime for maintenance. The mechanic has rarely visited in the years I've been working here, so that speaks for itself."

Predictable

For Bert, consistent quality is very important. He concludes: "Some want to have a small radius to the sheet, but others prefer to see a real rounding to the product. We can simply control the conveyor speed to a lower setting. As a result, there are no sharp edges to the product at all. Equally

important is the predictability of the result. In other words: does the product meet expectations? I set up the machine and examine the first product. If that's good, I want the rest of the series to come out the same way, giving you a consistent end result. Predictable production is what I want to offer."

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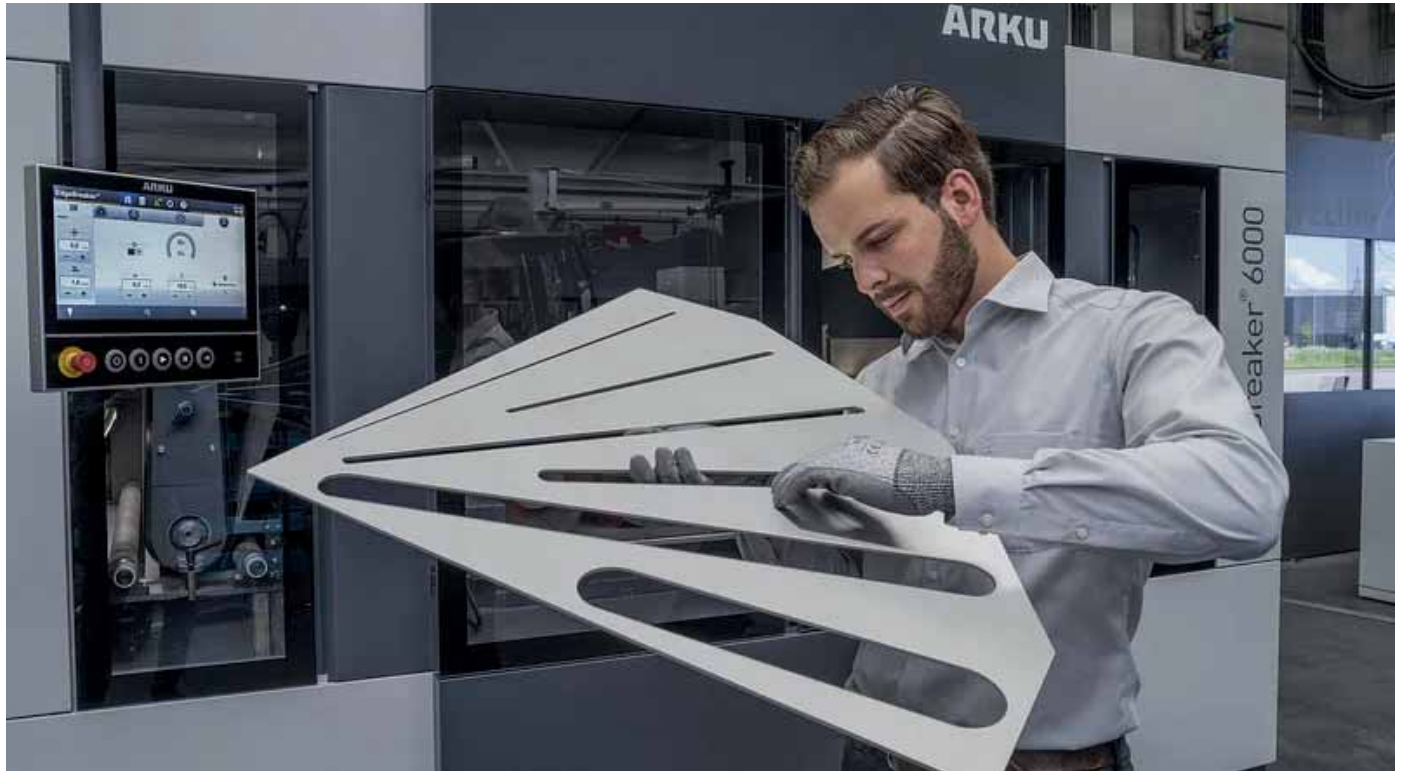
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Deburring machine makes laser cutters flexible all around



This deburring machine makes laser cutters flexible all around!

Producing sheet metal parts economically in small quantities, that is the strength of laser job shops. This is made possible by the laser as a particularly variable tool. However, other units in the process chain must also be flexible. For this purpose, ARKU has introduced the EdgeBreaker® 6000 deburring machine.

When no two parts should be the same, laser job shops are in demand. Because of their most important tool, the laser, they can cut sheet metal just the way they want it. They can also do it without the cost of changing tools or retooling.

However, laser cutting can produce a burr under certain conditions. This burr must be removed because most customers now want burr-free parts. Therefore, how can a deburring machine be as flexible and handle as much part variety as the laser? ARKU provides the answer with the EdgeBreaker 6000.

The machine manufacturer deliberately designed it as a universally deburring machine. To make this possible, a vacuum table is used as a workpiece support. In this

way, the EdgeBreaker 6000 can also accommodate small parts. Even workpieces the size of a 2-Euro coin can be securely fixed and processed with repeatable accuracy.

Rotor equipped with rotary brushes rounds sheet edges uniformly

A rotor equipped with rotary brushes is located above the vacuum table in the centre of the machine. The advantage of this design is the fact that the sheet edges are rounded more evenly than with any other deburring machine. This is because the brushes always hit the sheet from different directions. This means that they remove the material very evenly, both on the inner and outer contours of the workpiece. Even a radii of up to 2.0 mm is possible.

The rotor with the rotary brushes is joined by a grinding belt for deburring and a fleece belt for surface finishing. Together, these three units of the EdgeBreaker 6000 enable significantly improved sheet metal quality. This is important, for visible parts made of high-quality stainless steel.

In addition to laser cut parts, the EdgeBreaker 6000 also processes stamped parts, whether small or large. If required, the deburring machine can even handle material thicknesses far beyond the thin sheet range.

EdgeBreaker 6000 meets medical technology requirements

Users are also enthusiastic about the EdgeBreaker 6000. One of them is MBEngineering: The company from Dürbheim, Germany, manufactures, among other things, perforated parts for sieve baskets in hospitals. The surfaces must be easy to clean and disinfect. To prevent dirt and bacteria from settling in the first place, there must be no scratches or unevenness. In the case of the screen baskets, this became a problem. "Our older belt grinder, which we used for deburring, does not provide sufficient edge rounding for perforated parts," reports founder and CEO Manfred Butsch. However, customers would expect complete edge rounding, not just on the outer contour.

Therefore, another machine had to be procured. MBEngineering decided on the EdgeBreaker 6000: "We needed a machine that sufficiently deburrs and rounds our perforated parts. With their size, our workpieces fit perfectly into the machine's spectrum," says Simon Köhler, authorised signatory and responsible for metal processing at the company, explaining the decision. He continues: "Due to the complete processing on the EdgeBreaker 6000, we were able to save an additional work step."

In addition, the automatic wear control and compensation of the tools lead to a very high process reliability. "The deciding factor for the purchase was, in particular, its easy cleaning and maintenance. In operation, the EdgeBreaker 6000 is characterised by simple and fast replacement of the tools," Simon Köhler continues. This is made possible by a quick-change system that reduces setup times, an important aspect, especially for small batch sizes.

An easy-to-understand user interface also helps the user to set up the EdgeBreaker 6000 correctly. Tips on operation or maintenance of the deburring machine are also available to the operator.

EdgeBreaker 6000 brings decisive competitive advantage

"With laser cutting, burrs are more likely to form as the material thickness increases. Sooner or later, you have to rework. This is more ergonomic and less expensive with the EdgeBreaker 6000 than by hand," adds Daniel Gabriel, head of laser technology at Autz + Herrmann in Heidelberg. The quality is also right, as he reports.

Robert Stansell, co-founder of manufacturer "The Router Mill" in Lawrenceville, USA, is also enthusiastic: "Perfectly deburred and rounded edges are crucial for our part quality," he says. After a colleague told him about ARKU, it didn't take him long to decide on an EdgeBreaker 6000. He concludes: "The machine can process a wide range of parts from 1 to 25 mm thick. That's exactly the flexibility we need. The EdgeBreaker gives us a strong competitive advantage over many other laser job shops. With this machine, we are setting a trend."

ARKU offers machines and services with high value retention. In doing so, it ensures process reliability and efficiency for



Machining with the EdgeBreaker 6000 makes the difference: With burrs and without rounded edges, hardly any customer still accepts the workpiece.

customers all over the world. Its machines and systems form this foundation. To successfully handle tomorrow's challenges, it is positioned to meet the demands of the future yet is also remains true to its origins. For decades, it has been a market and technology leader for precision levelers. Innovative deburring technology expands its industrial expertise.

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Master reveals four benefits of MVK-Line micro-motors

At the start of 2023, Master Abrasives became the UK & Ireland distributor for MVK-Line, promoting their innovative range of micro-motors and battery powered hand tools. After ten months of successful customer trials, including in large aerospace manufacturers, Master has revealed four distinct areas of benefit for the range.

MVK-Line is a German manufacturer of high-quality electric tooling systems, whose equipment can offer substantial benefits to the manufacturing sectors. With a range of micro-motors and hand pieces suitable for use with shank-mounted abrasive consumables and the Airliner-ONE battery powered hand tools specially designed and approved for spot finishing and hole deburring in aerospace industry, the range is an ideal fit with the Master Abrasives portfolio.

The build quality of MVK-Line products is exceptionally high, which is evident as soon as you pick up a hand piece, while the power and torque generated by the controller unit and hand pieces is higher than other similar equipment in the marketplace. MVK-Line offers an array of handpieces available with variable speeds, ranging from 2,000 rpm up to 80,000 rpm. The brand new M4 handpiece is pencil grinder sized and very lightweight, running up to 70,000 rpm, while the larger more powerful M11 handpiece runs up to 30,000 rpm and can fit either a 3 mm or 6 mm collet.

Master has been carrying out trial work across the UK in leading aerospace and casting companies. Andy Wright, national business development manager for Master, states: "The feedback on the MVK

micro-motors has been very positive and initial scepticism by some in using a new method was short-lived, disappearing as soon as they used the system." During the trialling process, four distinct areas of benefit that this equipment offers became apparent.

Health & safety

Very low Hand Arm

Vibration levels [HAVS] due to the high-quality bearings and highly balanced spindles. The handpieces are significantly quieter than their pneumatic counterparts, also, operations are safer and cleaner with no lubricants leaking and spraying over components, workstations or operators. The clear digital display and easy control of the variable speed also allows operators to run their consumables at or below the maximum operating speed.

Energy savings

The high costs of generating compressed air makes it one of the most expensive forms of power, with leaks between the compressor and power tools adding even more to the costs incurred. In one comparison test, a 95 percent saving against compressed air was calculated when using the MVK micro-motors.

Efficiency/performance

The increased and consistent torque, with no drop off in power or speed as the abrasive consumable meets the workpiece, enables the maximum performance of the consumable. This, in conjunction with the variable speed feature, allows the consumable to run at its optimum speed, increasing the life of the consumables and improving its performance further still. One leading aerospace manufacturer identified a 50 percent increase in consumables life compared to those used in the equivalent air



tool. The variable speed also means one handpiece can replace any number of air tools running at the different required speeds.

Service/repair costs

Compressed air lines, if not properly maintained and clean, can damage the internal mechanisms of pneumatic tools leading to regular and expensive service/repair costs. With no airlines required and as MVK handpieces have a significantly lower number of wear parts compared to pneumatic tools, the periods between services can be considerably longer and bring the service costs down, as well as ensuring that tools give optimum productivity. Master Abrasives fully supports the range by offering servicing and repair of the MVK range at its repair facility in Daventry, Northamptonshire.

If you would like to explore the potential benefits of working with Master Abrasives and the MVK micro-motors and equipment, contact them and take the first step to improving your productivity.

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

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The different types of vibratory equipment and media used in vibro deburring

Whether it's for preliminary or finishing purposes, vibro deburring is unmatched in its polishing capabilities. But what media is in use during this process? From the deburring machine itself to the moulded pellets inside, each element is crucial to strip the sharp burrs from the components and result in a smooth and uniform finish. What does this technique use to achieve optimum deburring results? Supersheen use several components to ensure that its deburring services enable maximum performance and longevity of parts.

The most crucial piece of equipment for this finishing technique is the vibrating machine. All vibratory polishing media and metal items are placed into the machine's bowl. After that, it will begin to vibrate up to 3,000 times a minute. This level of motion ensures that even the sharpest edges are comprehensively ground down, washed and chemically treated.

Often, these machines are referred to as vibratory bowls due to their pot-like appearance.

The vibratory polishing media used for

vibro deburring is specific to the components being deburred. Most commonly, ceramic media is used. This is due to its high density, tough nature and durability. In fact, ceramic media is also used in burnishing, as well as other polishing methods. In addition, it is primarily used when focusing on steel, stainless steel and titanium.

Once it has been placed into the container of the vibratory tumbler, the vibrations begin, causing the metal finishing media to shake and tumble against the components. Immediately, all excess residue, debris, sharp edges and even rust are removed. Leaving a sleek, shiny and flawless surface area.

Supersheen offers a selection of metal finishing services designed to achieve a variety of results. As mentioned, its vibro deburring services focus on eradicating sharp edges and debris for a polished part. This is especially helpful if you're in the automotive or medical industries.

If you are based in car manufacturing, vibro deburring is ideal for buffing large



metal parts so that they function seamlessly when fitted into the vehicle, for example for gearbox parts.

Secondly, Supersheen regularly offers its deburring services to medical companies. Due to the safety requirements in medicine, vibro deburring provides a level of reliability that cannot be attained elsewhere. For instance, where medical instruments are concerned, they need to be immaculately smooth to avoid injury when used.

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30 years of partnership

Schnebelt Präzision and ANCA forged a winning relationship through technology and trust

Today's Schnebelt Präzision KG, from Schutterwald in Germany, was founded in 1985 as a regrinding company for circular saw blades. Only two years later, Rolf Schnebelt expanded the range to include machine tools, which he sold to manufacturing companies as a sales representative.

The company's own machinery was upgraded in 1996 with the first state-of-the-art, computer-controlled grinding machine for precision tools. Pat Boland, co-founder of ANCA, inspected the newest ANCA machine FX5 at Schnebelt during a recent visit. Using the ANCA AR300 loader with collet changer, tools with various diameters are now produced and reground automatically and with high precision by Schnebelt.

The companies of Rolf Schnebelt and Pat Boland share a very special history. Schnebelt Präzision KG entered the field of regrinding shank tools with ANCA in 1996, shortly after the ANCA branch was founded in Germany. But why did Rolf Schnebelt decide on an Australian machine back then, when they live in Baden-Württemberg, the centre of gravity of machine tool manufacturing? According to Rolf



ANCA founder Pat Boland, entrepreneur Rolf Schnebelt and Jan Langfelder, today responsible for the global key accounts at ANCA

Schnebelt, the search for the right tool and cutter grinder to start the new business segment took some time. The performance of the commonly available machines was

not convincing, the controls did not deliver satisfactory results, the transfer of the NC programmes to the machine sometimes took 30 seconds or more. Then the company came across the ANCA machines, whose concept was not offered by any other competitor at the time. A powerful control system, user-friendly software and training by the local ANCA experts made the entry into 5-axis grinding possible. "We were particularly convinced by the machine's progressiveness, which showed in the speed of the control, the axis movements and the achievable surface quality," says Rolf Schnebelt.

Pat Boland explains the situation at the time: "We came from automation when we founded our company in 1974. Our goal has always been to enable leaps in development through the use of new software, control and automation concepts. Of course, then as now, our development work is fundamentally based on the requirements of our customers. But it is also our task to further develop grinding technology as a whole, as we have succeeded in doing, for example, with 3D simulation, the introduction of linear drives or laser measurement."



Jörg Scheidecker, head of technology at Schnebelt Präzision KG, operating the RoboMate software on the new FX5 CNC 5-axis tool grinding machine

Jan Langfelder, who founded the German ANCA branch in 1991, describes how the company managed to enter the market: "At the beginning of the nineties, our advanced technology was more something for larger companies that recognised the potential of our novel solutions and subjected our machines to the reality test. For us as ANCA, proving our machines' capabilities was naturally an essential part of our strategy. To enter smaller companies we approached businesses that had an innovative spirit and then worked hard to demonstrate our technology capabilities and solicit trust. The foundation of ANCA Germany was a very important step here so that we could be close to our customer base and form strong relationships with them on the ground. After many meetings, Schnebelt placed its trust in us and we installed the second machine here that we had ever sold to Germany."

Rolf Schnebelt confirms: "I was able to inspect the first ANCA machine for a German customer at a trade fair, Nortec, in Hamburg. After a reference visit in Mannheim, we were convinced of the machine, but one of the decisive factors for the purchase and the successful start was the commitment and support of Jan Langfelder. I still remember how we sat together for lunch at our home and finalised the purchase and how Mr Langfelder later also took over the setup and training. By the way, even back then the installation space was a factor. We started tool grinding in our garage, where the small footprint of the ANCA was a real advantage."

Schnebelt continued to develop its range of cutting tools in the following years, especially with a focus on customised special tools. Solid carbide tools for particularly demanding tasks were offered from 1996. The positive development was reflected in the growth and in 2002, a new production and storage hall was built with a total area of 4,000 sq metres. In 2014, further technological progress was made with the introduction of the company's own coated end mills, which are used for high-performance cutting. Schnebelt relies exclusively on ANCA machines for the production and regrinding of rotary tools for customers throughout the region.

After the company's 35th anniversary last year, Doris and Rolf Schnebelt handed over their company to their son Pascal Schnebelt, who runs the business together with his wife Silke. Together with the 40-strong workforce and with a new brand image, Schnebelt Präzision KG is tackling ambitious goals. Above all, the areas of tool development,

production and preparation are to be expanded through market development and new digital possibilities.

The long-standing partner ANCA naturally plays a vital role in the process. A major advance in terms of productivity and concentration of the highly skilled staff on core tasks was achieved with the new ANCA FX5 with robot automation and collet change for automatic machining of tools with different diameters. Despite complex geometries and small batch sizes, the machine now runs for 5-6 hours at a time without any operator intervention.

According to Jörg Scheidecker, Schnebelt's long-time technical director. "Our product range is characterised by the fact that we produce high-performance tools efficiently and in top quality, even in small batch sizes and that we offer our customers considerable advantages through our uncompromisingly quality-oriented sharpening offer. Complex geometries and even small diameters down to 2 mm are no problem for us."

The design of the tools as well as the analysis of the geometries and the creation of the programmes for regrinding are factors that require expert contribution. The highly skilled people's time is limited which makes automation key to increasing efficiency. This is why ANCA created an entry option for automated production that does not require major organisational changes or lengthy training phases.

With the AR300 loading robot, ANCA offers a proprietary entry-level solution that was designed to give users quick and easy access to the advantages of automated production. The cost-effective 3-axis robot, with double gripper for fast loading and unloading of tools with diameters of 2-20 mm, can be accommodated in the machines of the FX series without increasing their footprint. The control system also comes from ANCA, which ensures seamless integration and support. Particularly important for beginners, commissioning is straightforward with ANCA's RoboTeach package, programming and operation is carried out via ANCA RoboMate software directly on the user interface or with the handheld control unit. Users do not need any skills or knowledge in robot programming.

Another aspect of the AR300 solution used at Schnebelt is the possibility of machining different diameters. In addition to the flexibly applicable software, there is the possibility to change collets. Tools with different diameters are placed in the pallet in



Tool pallet with collets



Measurement of the tool for runout compensation by means of a measuring probe

collets with identical diameters. A suitable standard gripper on the AR 300 loads the collets into the spindle equipped with a corresponding chuck. This way, the pallet can not only accommodate different batches with identical diameters, but the variance is extended to diameters of 2-18 mm.

"This solution significantly expands the use of the machine and our flexibility in production," says Pascal Schnebelt. Jörg Scheidecker concludes: "At first, we had difficulties achieving the admittedly tight tolerances when machining small diameters, but we found a solution in exchange with ANCA." By replacing the original collets and chucks with GDS µGrind variants, the required tolerances were achieved. For new tools, ANCA's runout compensation is also used, which eliminates axial and radial runout via a software feature. For this purpose, the blank is measured at the top and bottom of the tool's outer diameter and the programme is adjusted via the digital model so that the deviation is compensated for during grinding. In this way, a tolerance within a few µm can be maintained even for the smallest tools.

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Unilap steps into new sectors with Vollmer

Darrell Hughes founded South Yorkshire Saw & Tool Co in 1974 as a small saw blade sharpening and ancillary supply company. Wind forward almost 50 years from the inception of a company working out of a two-bay garage, the transformation of the Doncaster company is beyond all comprehension. Everything has changed. The company name, the facility, the industries served, the manufacturing processes. In fact, the only remaining constants are the long-serving personnel, the family ownership and the sharpening technology from Vollmer UK.

Changing its name in 1992 to Systco Unilap, the saw blade sharpening company acquired its first Vollmer machine in the late 1970s and has bought a complete suite of German-built machines over the years. Initially serving local customers, Systco has invested in state-of-the-art technology and automation. The result is that the company now manufactures more than 5,000 product lines that are shipped around the UK daily. Unilap utilises its automated CNC technology to manufacture everything from circular saws, TCT and PCD tipped rotary tools and solid carbide tools that encompass everything from routers, profile tools, boring bits, grooving, rebating and spindle tools plus much more. To manufacture the countless product lines with thousands of new, re-sharpened and serviced tools being delivered each week, the company has 11 Vollmer machines, three of which were delivered in 2022.



The fully loaded Vollmer QXD 200 at Systco Unilap

Longstanding experts in the woodworking and metal-cutting industries, Unilap has transitioned this mastery into specialist tooling solutions for the automotive, aerospace and composite sectors. With 25 percent annual post-Covid expansion in traditional markets and growth in new segments, Unilap needed capacity and a Vollmer CHX840 with an HS loading system was delivered in April 2022. This was rapidly followed by a Vollmer QXD250 with the HC5 loader in July and then a Vgrind 260 with an HC4 loading system in October.

The reasoning behind the CHX840 and the QXD250 was simple. The automated CHX840

saw blade sharpening machine was purchased to add unmanned 'lights-out' running and alleviate capacity on the 22-employee company's other saw blade manufacturing and servicing machines. Likewise, Unilap already had a nine-year-old Vollmer QXD200 machine running around the clock, so upgrading to a brand-new QXD250 would add capacity. It would also support the rapid growth in the metalworking industry and give continuity of supply in the event of planned maintenance or machine downtime on the existing QXD200. However, the Vgrind 260 was a completely new technology and a leap of faith for Unilap. As managing director Carl Hughes says: "We have been buying Vollmer machines for over 40 years and we love the brand. The build quality, innovation, reliability and the ability to outperform all other machines is what keeps us buying Vollmer. However, the Vgrind 260 was a completely new concept for us and a huge leap of faith, but it's a leap we are delighted we made."

Prior to the arrival of the Vgrind 260, Unilap was manufacturing solid carbide round tools as well as servicing and re-grinding customers' end mills, drills, reamers and a vast array of special tools on two alternate machines. The two manually loaded grinding centres were permanently manned by one employee who would switch between machines to load/unload tools and continually programme, change and set up the grinding wheels for the vast array of tools passing through the workshop each week.

Delivered in October, the Vgrind 260 with the HC4 chain magazine loader incorporates Vollmer's unique multi-layer machining concept that has two vertically positioned grinding spindles on the C-axis pivot point. Each grinding spindle has a four-wheel grinding pack that sees the machine wheel exchanger loaded with a total of eight-wheel sets that are automatically changed and probed, giving Unilap never before seen levels of flexibility and automation.

Commenting upon this innovation, recently appointed general manager Bob Young, an established and well-respected figure in the cutting tool industry says: "The Vgrind 260 has been a revelation for our business. The transition of rotary carbide tools from our other CNC machines to the



Vollmer UK managing director Martyn Cross with Systco Unilap general manager Bob Young and managing director Carl Hughes

Vgrind has been seamless. The NUMROTOPLUS software platform makes programming easy, as it combines simulation and collision monitoring in an intuitive control panel. This is perfect for processing new tools and moving existing tools from our other machines has proven to be simplistic."

Like any manufacturer that produces and services cutting tools, setup times can diminish profitability, prolong lead times and require significant staff input. Not, however, with the Vgrind. As Bob Young explains: "Previously, we would have to schedule and allocate particular tools to respective machines to minimise the changeover of grinding wheels, collets and re-programming. Now, we can load up the HC4 Plus chain magazine with a range of different tool diameters and the Vgrind will just run."

Manufacturing 1-offs to batches of new tools as well as regrinding tools on short lead times, and turnaround times to get the first-off tool from the machine are critical. Bob Young adds: "The machine setup time can be time and labour intensive. The Vgrind 260 has slashed our time to get 'first-off' tools off the machine by more than 80

percent, this is an incredible saving. The ability to rapidly set up and run a complete mix of tools automatically on the HC4 Plus automation system doesn't only slash our setup and first-off times, it gives us very easy access to 'lights-out' production."

The Vollmer HC4 automation system can accommodate up to 158 round shank tools of different diameters with automatic collet changing to suit the tool diameter, or up to 52 HSK-A63 tool holders.

While the Vgrind machine was purchased to add solid carbide rotary tool capacity, the new QXD250 was installed to underpin the growth of the PCD tipped tool division.

Before the arrival of the QXD250, the existing QXD200 machine was running 24 hours a day and 6 days a week, giving the company no opportunity to grow. Additionally, any time-consuming complex tools would create a bottleneck. Bob Young says: "With the new QXD250, we can reduce the lead times to less than 1 week and, in many instances, 2 to 3 days."

The QXD250 was supplied with the HC5 automation system that can accommodate 28 tools up to 320 mm in diameter and 250 mm long with a weight of up to 25 kg. Offering 24/7 unmanned running, the new



Carl Hughes programming the new Vgrind 260 at Systco Unilap

QXD250 at Unilap is frequently running non-stop for five to six days unmanned. Bob Young concludes: "The new investment in state-of-the-art technology from Vollmer is a statement of intent from Unilap, as we aim to expand our presence in particular metal cutting sectors like the aerospace, automotive and composite machining sectors."

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Transitioning to a new vapour degreasing fluid

by Elizabeth Norwood, senior chemist, MicroCare LLC



Key considerations for metal fabricators

Some metal fabricators have depended on well-established vapour degreasing fluids for many years to successfully eliminate oils, greases, polishing compounds, dust, dirt, metal fines and various other contaminants from their manufactured parts. They have identified a fluid that consistently delivers reliability, effectiveness and aligns with their specific cleanliness requirements and environmental regulations. The significance of effective cleaning cannot be overstated, as it directly influences surface characteristics, impacting both the parts' functional performance and aesthetic appeal.

However, a challenge arises when fluid suppliers discontinue these trusted and critical chemistries. In such instances, locating an optimal long-term replacement, while minimising operational disruptions, becomes important. This process entails thoroughly evaluating multiple key factors and careful planning. Factors such as part miniaturisation, intricate designs, innovative materials and delicate coatings and surface finishes compound the complexity of this decision even further. Coupled with these challenges are the pressing concerns of cost optimisation and evolving environmental directives.

Facilitating a seamless transition

One of the most important considerations when replacing vapour degreasing fluid is its compatibility with the existing equipment. Manufacturers rely on a range of specialised machinery, each imposing unique demands on the cleaning process. An ideal cleaning fluid should necessitate minimal, if any, modifications, or upgrades to the current equipment setup.

Fortunately, modern vapour degreasing

fluids, specifically formulated for metal parts cleaning, often offer a solution. Many of these fluids exhibit non-flammable and environmentally responsible properties. They seamlessly align with the requirements of existing equipment and can be 'dropped in' as a replacement once the vapour degreasing machine has been emptied and cleaned of the old cleaning fluid. Transitioning to these advanced fluids can frequently be accomplished with minimal adjustments to the cleaning process, ensuring uninterrupted production workflows.

To guarantee a seamless transition, meticulous planning and preparation are critical. When deciding on the appropriate cleaning fluid, several key factors should be considered:

Substrate compatibility

Manufacturers should prioritise substrate compatibility when selecting vapour degreasing fluids to preserve material integrity and ensure efficient cleaning processes. It is essential to engage potential suppliers in discussions about the cleaning fluid's compatibility with specific parts materials and equipment to achieve this.

For instance, when cleaning steel parts, it's important to inquire about the cleaning fluid's ability to protect against corrosion. Similarly, if specific cleaning equipment is in use, manufacturers should ask about the compatibility of the cleaning fluid to assess whether the equipment requires any upgrades or modifications to work effectively with the chosen cleaning fluid.

As changes may be imminent, it is important to initiate transition preparations promptly. This could encompass conducting small-scale tests on new cleaning fluids to verify their effectiveness without risking harm to equipment or parts substrates. Additionally, employee training on properly utilising the new cleaning fluid and fine-tuning the cleaning process for optimal performance may be necessary.

Type of contaminant

Manufacturers should ensure that the chosen cleaning fluid works on the specific contaminants present on the parts. For example, non-polar contaminants like oils

and greases are best addressed with non-polar cleaning fluids, while polar contaminants like emulsion residue may necessitate different cleaning chemistries.

Testing is critical in transitioning to a new cleaning fluid to ensure it will be effective at removing specific contaminants. Lab-tested vapour degreasing fluids are engineered with a blend of ingredients to deliver consistent and reliable cleaning results. These fluids are designed to be strong enough to remove the contaminants yet compatible with various materials to minimise damage to delicate surfaces or components. Whether a single fluid or a custom mixture is used, it must be tested to the specific cleaning task to guarantee its suitability and effectiveness.

Long-term availability and sustainability

The selection of a vapour degreasing fluid for metal and surface cleaning extends beyond immediate requirements. It necessitates the prioritisation of long-term availability and sustainability. Manufacturers are advised to opt for fluids with a proven track record of effectiveness and environmental responsibility.



Manufacturers should also consider the long-term availability of the selected fluid. If a fluid has a limited availability window, it could be a challenge to find a suitable replacement when needed.

Furthermore, it is critical to consider the environmental impact of the chosen fluid. Many modern vapour degreasing fluids are designed with an emphasis on environmental responsibility. They feature characteristics such as a low global warming potential, zero ozone depleting potential and the absence of hazardous air pollutants to reduced impact on air quality. Prioritising sustainability is advantageous, benefiting not only the environment but also

the health and safety of people around the globe.

Supplier support

When transitioning to a new cleaning fluid, choosing a supplier becomes crucial. Manufacturers should align themselves with a knowledgeable partner who has expertise in vapour degreasing and can offer the following essential support:

Technical expertise

The selected supplier should have a deep understanding of both the cleaning fluids and the cleaning equipment. This knowledge ensures they will provide relevant technical support, effective troubleshooting and comprehensive training related to the new cleaning fluid.

Laboratory support

The supplier should have a laboratory support structure to help manufacturers transition smoothly to the new cleaning fluid. This may include testing the new fluid on specific parts and equipment to ensure compatibility and performance.



Customer service

Opt for a supplier with an exceptional customer service track record. Their availability to promptly address inquiries and concerns is crucial for a smooth transition.

Furthermore, manufacturers should consider the supplier's industry experience and commitment to sustainability and environmental responsibility.

Choosing a replacement

The replacement of a trusted vapour degreasing fluid may initially appear to be challenging. However, by evaluating equipment compatibility, substrate preservation, contamination types, long-term availability and supplier support,

manufacturers can make an informed choice, selecting a replacement cleaning fluid that optimises cleaning performance while minimising environmental impact and disruption to their cleaning processes. Assistance and expertise are readily available and with a structured approach, selecting an appropriate replacement cleaning fluid becomes an achievable objective for metal machine shops and surface finishing facilities.

Author information:

Elizabeth Norwood is a senior chemist at MicroCare, LLC, which offers precision cleaning solutions. She has been in the industry more than 25 years and holds a BS in Chemistry from the University of St. Joseph. She researches, develops, and tests cleaning-related products and currently has one patent issued and two pending for her work.

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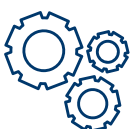
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MecWash MWX300 drives efficiency and sustainability for APT Leicester

MecWash Systems created a bespoke aqueous cleaning system that has revolutionised the effectiveness of the washing and degreasing programme of leading precision mill turned parts and CNC specialists, APT Leicester. The upgrade from a perchloroethylene cleaning system to the MWX300 has streamlined the cleaning operation and enabled APT to simultaneously prioritise its environmental goals and increase its output, all while maintaining the highest standard of finish.

The initial research and analysis with APT allowed Paul Jarratt, sales manager at MecWash, to gauge the application and outline the machine specifications required. These discussions are essential to gain a full understanding of the geometries used and the contaminants involved.

APT Leicester manufactures precision turned parts and offers CNC machining services. The business supplies turned component parts to industries, including aerospace, where the stringent requirements regarding the quality of the components requires rigorous detail at every stage of the manufacturing process.

Paul Jarratt says: "APT's CNC processes primarily focus on precision machining using a diverse range of materials such as stainless steel, aluminium, brass, plastics and titanium. The MWX300 cleaning machine plays a crucial role by cleaning the mill turned parts before they are shipped to customers or undergo any additional heat or surface treatments. The former

perchloroethylene cleaning system did an effective job, but APT transitioned from it due to environmental considerations."

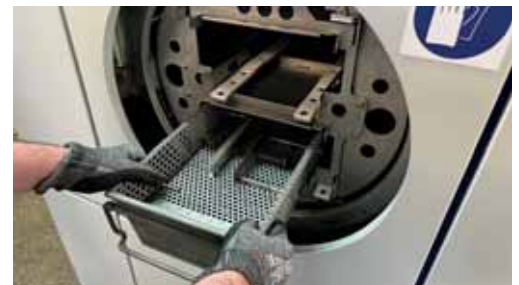
"The MWX300 was selected as the most appropriate system due to its compact size and powerful cleaning capabilities. The ultrasonics provide up to 30 watts/litre of high-power to unsettle any contaminants from the components. The MWX300 provides an immaculate surface finish with both hot and vacuum drying functions.

"Due to the limited floor area available the MWX300 was designed with roller shutter doors in place of conventional swing doors to aid access, APT were also particularly interested in adding our Aqua Save system to reduce water consumption and improve sustainability. This innovative MecWash system captures, filters and recirculates the cleaning water," adds Paul Jarratt.

Nick Baller, managing director at APT Leicester, comments: "Manufacturing top quality mill turned parts requires detailed cleaning and we were confident that MecWash had the experience in manufacturing to create an efficient solution. The cleaning performance of the MWX300 has been a major step forward in our sustainability credentials. The results have been excellent, with parts that are oil free and ready for shipping.

"The productivity of the business has improved with the MWX300 system. We can effectively clean the turned parts that we manufacture, leaving them entirely free of oil, small swarf and debris. The system has helped to drive our mission of providing first-class, sustainable CNC manufacturing to our customers."

John Pattison, managing director at MecWash, says: "We were delighted to supply APT Leicester with the MWX300. This compact system is a suitable for applications such as turned parts production as it is proven



to clean challenging components. The cost savings and environmental benefits of an efficient aqueous cleaning process are well established.

"The MWX series represents the highest standard of parts washing in the market and can clean large volumes to the same continuously high standard. The experience of the team in designing and building parts washing machines for customers from across aerospace, automotive, defence, engineering and medical, gives us total confidence in meeting and exceeding the specific needs of manufacturers."

MecWash drives automotive component cleaning

MecWash Systems is helping the automotive industry to deliver on environmental performance and high precision cleaning using the latest in aqueous parts washing technology. MecWash has kept pace with the evolution of the motor industry by embedding advanced technologies in its industrial parts washers, providing real-time monitoring and feedback to clean high volumes of components with ease.



Automotive manufacturers require extremely fine tolerances to ensure engine reliability and performance. Consequently, the cleanliness specifications are becoming tighter and OEMs are enforcing standards more rigorously than ever. The cleaning challenge gets tougher and tougher.

The applications of the motor industry require precision cleaning and degreasing. The MecWash team conduct detailed laboratory tests and machine trials on components at its Tewkesbury facility to identify the optimum system configuration, wash process, chemistry and fixtures. MecWash's expertise covers all the main precision manufactured automotive components including both ICE and electric powertrain, braking systems, steering systems and hydraulics for 'yellow goods.'

MecWash's core washing process combines rotating components held securely in baskets, fixtures or plastic containers about the horizontal axis while subjecting them to a high-volume spray and flood process, also using ultrasonics where needed. For particularly complex components, e.g engine blocks, the systems utilise MecWash's dedicated jetting

technique with jets that rotate with the components, focused on critical features and designed for each customer's specific application. This bespoke approach helps to target contamination directly, providing precise cleanliness and fast cycle times. Hot air and vacuum drying finish the process to give completely dry components.

International OEM's such as JLR, JCB, Caterpillar/Perkins, Cummins and Triumph Motorcycles all benefit from MecWash parts washing systems. This experience has provided the MecWash team with a vast knowledge of designing, building and servicing aqueous cleaning systems for automotive applications and the high standards that the giants of the industry require.

MecWash also manufacture bespoke washers for Tier 1 and Tier 2 automotive component manufacturers including Autocraft, Ryobi, TRW, Dana, Le Belier and Grainger & Worrall. The Tewkesbury based business exports numerous machines to customers worldwide, such as JCB, Perkins and Craftsman in India; Trelleborg, TRW and Le Belier in China; Husco, Stewart and RPK in North America along with numerous

systems in Europe. The MWX series represents the pinnacle of the aqueous washing industry and is proving very popular with automotive component manufacturers. The precision capabilities of these relatively compact systems, along with the reliability to run 24/7, is a key point of interest for customers. The MWX series of parts washing has an unrivalled ability to remove preservative oils, machining lubricants, metal swarf and chips from components, with a compact footprint, making it ideal for a factory setting where space is at a premium.

As well as saving factory space, manufacturers are also looking to minimise the use of water and energy to reduce their environmental impact and costs. One of the popular choices for automotive manufacturers is the Aqua-Save system, designed in-house to continuously recover and re-use the wash water in the parts cleaning systems.

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A better way to clean

Given the wide range of fluids such as coolants and solvents that are often used in industrial settings, leaks and spills of these substances onto floors and surfaces can be a regular occurrence. This can be worsened when spillages spread to other areas, increasing risk of slips. Keeping these areas clean and safe can be a balancing act.

Mewa UK managing director, Günes Yenen, looks at how your choice of cleaning wipes can help improve health and safety compliance in your workplace, with the added benefit of being better for the environment and keeping your manufacturing facility clean and tidy.

Every year thousands of accidents and cases of ill health are reported from activities at industrial and commercial facilities. Health and Safety Executive (HSE) figures show that slips, trips and falls account for 30 percent of workplace injuries. Another source of ill health in industrial and manufacturing settings can arise from exposure to fluids such as oils, solvents and degreasers as well as additives and contaminants like metal fines. Common occupational diseases associated with these hazardous materials include dermatitis and asthma.

One increasing serious concern to the Health and Safety Executive (HSE) is contact dermatitis related to exposure to metalworking fluids like cutting oils and coolants. Every year the HSE reports around 200 cases of contact dermatitis related to exposure to these liquids to EPIDERM (European Prevention Initiative for Dermatological Malignancies) but believe them to be a very substantial underestimate of the true incidence of skin disease.

Employers are required to ensure, as far as reasonably practicable, the health and safety of employees as mandated by the Health and Safety at Work Act.

Companies must assess any potential risks to the health and safety of employees and others and take appropriate action to put effective control measures in place. Companies which fail to prioritise workplace safety could face significant reputational and commercial risks.

Measures required under the act include taking steps to control slip and trip risks as well as exposure to hazardous materials. Specific recommendations are to keep



absorbent materials to hand where there is a risk of a spillage and to clean up spills promptly to minimise the risk of exposure and slips and trips and skin exposure.

It's also important to keep the work surface area clean, including removing metal fragments and swarf with a cloth to avoid build-up and risk of puncture wounds from the sharp metal fines.

Industrial settings typically use paper roll or single use rags to mop up spilled liquids or clean swarf or liquids off machine parts. However, any type of wipes which are used for this application could be classed as hazardous waste, which then requires suitable management and disposal.

To ensure compliance with legal regulations, businesses must classify, separate and store any waste safely before it is disposed of by an authorised hazardous wastes contractor.

Furthermore, contaminated wipes may emit Volatile Organic Compounds (VOCs) or pose a fire risk, depending on the fluid they have been used to wipe up. To minimise risk to worker health and safety, they should be stored in a tightly closable container made of resistant material such as metal or special plastic, high-molecular, low-pressure polyethylene, before being disposed of in the correct way.

With companies facing increased pressure to attain high standards of health and safety, the practice of an alternative strategy to disposable paper towels and rags has emerged.



Today, third-party suppliers deliver industrial cleaning cloths as a 360 service, which are collected when used and replaced with clean ones. The cloths are delivered in robust storage containers that keep used and contaminated wipes safe and legally compliant until collection, removing the burden of hazardous waste disposal from the company. As the cloths are delivered on a pre-agreed rotation, they are always to hand, so spills can be rapidly addressed to reduce the risks of exposure to chemicals and swarf and slips.

Environmental benefits

Using a reusable wipes service is also more environmentally friendly than conventional alternatives. For example, Mewa wipes can be re-used up to 50 times and we estimate that the adoption of this service by our customers prevents thousands of tonnes of industrial waste being created.

MEWA

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Efficient and sustainable solutions for present and future parts cleaning challenges

An essential step in manufacturing processes, parts cleaning significantly contributes to product quality and adds considerable value. In the past years, the related tasks have become much more varied and challenging. At parts2clean, Ecoclean showcased a product portfolio optimally tailored to the highly different cleaning applications and requirements in the various industry sectors.

The range of cleaning applications and cleanliness requirements has never been as broad as today. On the one hand, high-technology industry sectors such as semiconductors, medical, sensors and analytics as well as precision optical are reliant on the efficient and dependable removal of ultrafine particulate contaminants in the submicron range and of residual film-type contamination, some of which have a thickness in the nanoscale. On the other hand, the general industry, which encompasses a multitude of sectors, first and foremost presents a need for removing

large amounts of chips and machining fluid. Between these extremes, there are countless cleaning tasks with product- and sector-specific cleanliness specifications. For these many-faceted applications and requirements, Ecoclean and UCM presented an optimally tailored offering of products and services at parts2clean. They are conceived to meet the respective cleanliness specifications not only in a stable and reliable but also efficient and resource-saving manner.

Sustainable and efficient cleaning solutions for all tasks

One topical section of the stand at parts2clean was committed to high purity cleaning and integrated in the fair's 'High Purity Lane'. A UCMSmartLine was demonstrated and showed the possibilities of combining standardised modules for the process steps wash, rinse, dry, load and unload and flexible part transport systems, into solutions capable of meeting even the



highest cleanliness requirements. Special process technologies such as PPC (Pulsated Pressure Cleaning) also contribute to these results. Information on the testing facilities offered by the manufacturer's high purity test centre, which was officially inaugurated at the end of 2022, as well as application examples complete the offering in this section.

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The University of Huddersfield reduces cleaning time by 75 percent

The school of art, design and architecture at the University of Huddersfield used a power wash to clean the aluminium honeycomb slats which forms the bed of one of its laser cutters.

"The slats became dirty from cutting medium density fibreboard and the residue was very difficult to remove. Each slat took half a day to clean with the power wash and the end result was very poor. Many slats had to be replaced because of poor cleaning results" says Chris Charlesworth, technical team leader for the University of Huddersfield.

The solution

The escalating cost of replacing slats and the increasing amount of time it was taking to clean them, without the desired results prompted the University of Huddersfield to search for a more efficient cleaning solution.

After researching the market, it decided to purchase a customised ultrasonic cleaning system from Ultrawave. The system was

designed to an exact size and shape of the slats so they would fit into it easily.

The University is delighted with the tank and impressed by the cleaning results. "It cleans to an exceptional standard and removes dirt and residue from the hard-to-reach areas that were previously impossible to clean," says Chris Charlesworth.

Using this ultrasonic cleaning system has reduced cleaning time from half a day to just one hour per Slat. "We load the tank and return in an hour to find the slats clean. It has more than paid for itself in the reduction of staff time and has made an extremely tedious task much safer and more pleasant. The team can now concentrate on other duties instead of spending a large amount of time using the power wash. The amount of time it saves us every day is incredible" says Chris Charlesworth.

Ultrawave's customised system has



reduced costs for the University as the slats don't have to be replaced as often. They are now cleaned to a much higher standard and therefore they last longer. Staff find the system easy to use and are impressed by its high standards of quality and reliability. "It makes the job much easier and to be honest I'm not sure what we would do without it" concludes Chris Charlesworth.

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ActOn AM Blasting Series

The most efficient solution for post processing additive manufactured components

ActOn Finishing has been developing mass finishing solutions since 1965, for a wide range of industries such as aerospace, medical, automotive, forgings and castings, hospitality and more. Since Additive Manufacturing (AM) 3D printing has become an established technology for prototyping and production, ActOn has been working with major manufacturers in the industry to adapt and develop finishing solutions that meet their stringent requirements.

Selecting the most suitable surface finishing technology is critical to prove the viability of components from a cost and functional standpoint. In an ideal world, surface finishing must be considered when designing components for 3D printing, to ensure the desired component and its characteristics can be achieved. In order to improve the appearance, surface roughness and mechanical properties of additive manufactured parts, ActOn has introduced in the UK market the AM Blasting Series. These blasting cabinets are designed for finishing powder-based metal and polymer 3D printed parts and to remove powder, even from parts with complex geometries, in an efficient way.

Based on the 3D printed part specifications, like material, dimensions, geometry and number of parts per batch, ActOn can offer both manual and automated shot blasting cabinets. However, since the manufacturing volume of additive manufactured parts has increased in the recent years, the most efficient solution in terms of cost and post processing time, is the automated blasting series. The AM Blasting Series includes:

AM DI Blasting cabinets

These cabinets are built for manual de-powdering and smooth finishing metal 3D printed parts. They are suitable for blasting of individual and large parts and are Industry 4.0 ready and ATEX certified for processes class II 3/-D T125°. Equipped with a cyclone to remove dust and powder from the blast media the cabinets can blast 3D printed parts up to a max load of 350 kg and are also suitable for shotpeening, without any modifications.

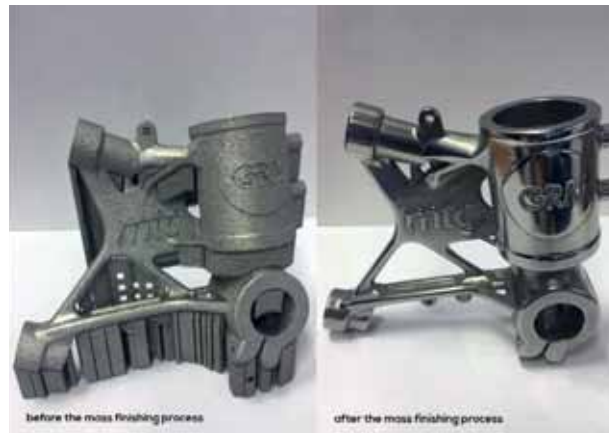
AM Blasting Clean

This technology is for the de-powdering of 3D printed polymer parts, which includes four models: Excel, Solid, Smart and Samba. These machines are designed to de-powder the 3D printed parts using a glass bead media. De-powdering with this kind of abrasive media has the advantage of achieving a deep de-powdering of the product and provides the ability to reach into corners where a round shot will not get.

AM Blasting Smooth

This series is ideal for achieving homogenous & smooth surface finishing on additive manufactured polymer components. Like the Clean technology, the AM Blasting Smooth Series includes 4 models: Excel, Solid, Smart and Samba. These machines are designed to shootpeen the 3D printed parts using a round abrasive media. As a result, the component's surface is homogeneous, smooth and porosity is reduced. The shotpeen treatment, in particular, improves the result of the subsequent coloring process.

Both the AM Blasting Clean and AM Blasting Smooth cabinets, depowdering units, comply with ATEX legislation, class II



3/-D T125° and are Industry 4.0 ready. They offer a reliable and repeatable finish each time while being easy to use with low maintenance costs. The cabinets offer the option to carry out manual blasting and are easy to load and unload.

After the de-powdering process, the next step in the manufacturing process is surface finishing and polishing. For this stage, ActOn has designed and built the vibratory finishing, CDF and CHEF technology. While the CHEF machines are the fastest finishing machines on the market to reduce surface roughness, deburr and polish 3D printed parts, vibratory finishing equipment can process high volumes of fragile parts. CDF systems can allow for reduced processing times of polymer AM parts when compared with standard methods, reducing process times by over 50 percent and being more aggressive.

To learn more about ActOn's technology and finishing process for the additive manufacturing industry, contact the team by sending an email to: sales@acton-finishing.co.uk. You can also request a free trial by visiting the website:

<https://acton-finishing.co.uk/free-trial/>

ActOn Finishing Ltd

Tel: 024 76 466 914



The biggest vertical shot blast machine ever built by Rösler goes to China

Stainless steel is one of the most important raw materials for many industries such as medical engineering, ship building, aerospace, etc. Accordingly, high volumes of stainless steel are used all over the world. To cope with the increasing demand, TISCO, one of the globally largest manufacturers of stainless steel, modernised the production line in its hot rolling mill for stainless steel plates. As a partner in this challenging project, Rösler has built the biggest vertical shot blast machine in the company's history.



To meet the customer's surface quality demands within the specified time frame, the Rösler engineers developed an innovative equipment concept. It combines two identical shot blast machines into one system, where the stainless-steel plates are passing through the two machines sequentially and each machine utilises a different blast media. The individual machines are equipped with twelve Gamma 400G turbines with an installed power of 37 kW per turbine. On each side of the blast chamber, six turbines are mounted at an angle. This turbine arrangement ensures that the plates are evenly covered by the blast media across their entire width. The total blast media throughput per machine amounts to 12,000 kg/minute, a huge quantity compared to the throughput of between 2,000 and 3,000 kg in standard shot blast machines. The high media throughput posed a particular challenge for the wear protection of the two machines. This challenge was met by fabricating the blast chamber from manganese steel and lining it with 10 mm thick, easily replaceable, wear plates, also made from manganese steel.

For shot blasting operations, where a higher surface roughness is specified, each machine can be run separately. In such cases the transport speed of the steel plates is reduced to 4 m/minute. To prevent media spillage, each machine is equipped with a high-performance blow-off system.

The entire vertical shot blasting system was designed and built in Germany. It was shipped to China by sea in 21 containers. Rösler service engineers, some of them from Germany, installed the system at the customer's location. Another challenge was that the installation had to take place during a time of strict Chinese travel restrictions and quarantine regulations. In addition, the installation had to be carefully coordinated with the service engineers of the company supplying the pickling line. Vasil Schaeermann, global sales expert at Rösler Oberflächentechnik GmbH, reports: "Only after the installation at TISCO could we test the entire system."



Because of the extraordinary size of the shot blast system, such a test was not possible during the production phase at our Untermerzbach plant in Germany. Fortunately, the commissioning at the customer location was successful. Actually, the entire project went very well. In the future we will build other vertical shot blast machines and I would like to point out that we are pleased with the cooperation between TISCO and Rösler."

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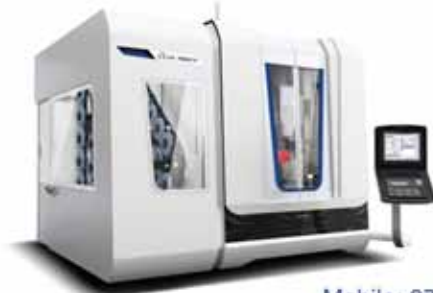
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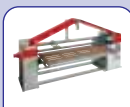
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