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Drill resharpener is part of the circular economy

Anyone who has visited a machine tool show anywhere in the world over the past five years or so will have found that automation, digitalisation and sustainability were overarching themes. Investment in the first two technologies undoubtedly boosts profits, while ecological measures to conserve precious natural resources have often lagged behind in the minds of manufacturers.

Yet of late, circularity in the factory is gaining real traction, driving down waste and creating thousands of new jobs. No initiative that protects the environment should be eschewed, even though some people's eyes tend to glaze over when eco-friendly activities are discussed.



Enter US firm Darex, which manufactures twist drill bit sharpening machines that make a real ecological difference at a fundamental level on the shop floor. Drilling is widely considered to be the most prevalent cutting process in manufacturing, so resharpener bits in-house when they have become dull leads to savings that have astonished some users after they have adopted the process.

Salisbury-based 1st Machine Tool Accessories, which has sold the machines exclusively into the UK and Irish markets for many years, can point to users of Darex equipment that have saved so much money by not throwing away worn drills or sending them out for sharpening that the cost of the sharpener has been amortised in less than half a year. After that, resharpener is virtually free for the lifetime of the machine, save for a little electricity and the occasional grinding wheel replacement.

The Darex XT-3000 drill sharpener in the photograph paid for itself in just five months, to the amazement of the Yorkshire subcontractor. The machine is able to restore left- as well as right high-speed-steel or solid carbide twist drills to as-new condition in a simple, three-step process. Attachments are available for sharpening drills up to 30 mm diameter, step drills, countersink and spot drills and others with a 90 degree point.

Manual, semi-automatic and fully-automatic Darex machines are available. Find out more by telephoning 01725 512517 or emailing enquiries@1mta.com and asking for a demonstration. The simplicity of use has to be seen to be believed.

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Next-generation vapour degreasing solvent for medical device cleaning

Precision cleaning plays a crucial role in medical device manufacturing, reinforcing both product quality and patient safety. Effective and validated cleaning processes are essential to prevent contamination and maintain compliance with industry standards. As global demand for medical devices grows, manufacturers must implement reliable, efficient cleaning strategies to uphold the highest standards of safety and performance.

The cleaning stage in medical device manufacturing removes oils, particulates, drawing/forming lubricants and a range of other contaminants, which is essential to achieving the required levels of product quality and biocompatibility. Even trace impurities can affect device performance or compromise patient safety, making thorough and validated cleaning essential to eliminate potential risks.

Medical device cleaning using vapour degreasing with ultrasonics

Ultrasonic vapour degreasing is an ideal process for cleaning medical instruments

because it combines three powerful cleaning mechanisms in a self-contained, controlled, residue-free environment. The process uses non-flammable solvent vapour to dissolve contaminants, followed by solvent immersion and intense ultrasonic agitation, to lift microscopic particles from complex geometries, internal passages, and difficult to reach crevices, essential for cleaning medical device instruments and implants.

The parts are immersed in clean solvent that

has been contained in the system and distilled. This ensures the consistent, repeatable removal of all contaminants, meeting the stringent precision cleanliness standards required for sterilization. From an engineering perspective, the closed-loop vapour degreasing process offers significant advantages in process control and cost-efficiency. Unlike open-bath or aqueous cleaning, the continuous distillation within the degreaser ensures the purity of the final rinse solvent remains consistent, virtually eliminating batch-to-batch variation, which is crucial for successful process validation in the medical sector.

Modern medical devices are complex assemblies of metals, ceramics, polymers and glass. During each phase of machining and finishing, oils, lubricants, polishing compounds, and particulates are introduced, which must be thoroughly eliminated prior to assembly or sterilisation. The vapour degreasing process, in unison with *ProSolv®5408e*, from EnviroTech Europe, offers a proven and effective way to clean medical instruments, with parts emerging



clean, dry, residue-free and ready for further processing within minutes.

The solvent of choice for the critical cleaning in the medical device cleaning industry

ProSolv®5408e is a high-performance, PFAS-free vapour degreasing solvent that delivers residue-free cleaning, essential for cleaning orthopaedic implants, dental, ophthalmic, surgical instruments, optical lenses and other medical devices. A next-generation solution which combines exceptional performance, environmental responsibility, and acts as a seamless replacement for discontinued 3M™ Novec™ fluids, such as Novec 71DE, 72DE and 73DE. It allows medical manufacturers to maintain the very highest standards.

ProSolv®5408e has exceptionally low surface tension and high solvency power, allowing it to



penetrate deep into micron sized holes and close contact surfaces, effectively removing contaminants whilst remaining compatible with a wide range of metals and plastics. The solvent is stable when used for vapour degreasing or cold dip cleaning and compatible with metals, including titanium, ceramics, glass and most plastics.

PFAS-free, high performance vapour degreasing with Zero Ozone Depletion Potential (ODP) and Global Warming Potential (GWP) of less than 1

ProSolv®5408e is an advanced, premium quality cleaning solvent designed to meet the highest environmental and performance standards. Completely PFAS-free (free from Per- and polyfluoroalkyl substances), it features zero Ozone Depletion Potential (ODP) and ultra-low Global Warming Potential, making it a truly future-proof solution.

ProSolv®5408e can be used in most solvent cleaning systems, one tank vapour degreasing or multi tank immersion/vapour tank systems using ultrasonics or flush cleaning. Components

emerge dry, eliminating the need for secondary drying or deionised water systems. Ideal for these safety-critical cleaning operations, matching performance expectations from the medical device production sector.

ProSolv®5408e provides superior critical cleaning performance and is a cost effective and sustainable solution for the removal of polar and non-polar soils and other contaminants, setting the standard for removing of machining and cutting oils, coolants, greases, grinding, buffing and polishing compounds, while leaving no residue. It's low boiling point directly reduces energy consumption compared to high-boiling solvents or heated aqueous systems, contributing to a lower carbon footprint and operating cost. The complete lack of a water-based drying step eliminates the need for expensive ovens or DI water systems, translating into shorter cycle times (typically 3-5 minutes) and a reduced footprint on the manufacturing floor.

ProSolv®5408e testing

Flash Point ASTM D3828, Flammable limits ASTM E918, Stock Loss ARP1755B, IGA Intergranular attack, Stress corrosion of titanium alloys ASTM F945-1.

Replacing discontinued 3M™ Novec™ fluids

The withdrawal of 3M™ Novec™ Engineered Fluids has left many manufacturers searching for compliant alternatives. **ProSolv®5408e** is engineered to fill that gap, offering a direct replacement for 3M™ Novec™ 71DE, 72DE and 73DE.

Benefits of using ProSolv®5408e

- Compatible with metals, ceramics, glass and engineering plastics.
- Fast cycle times: 3-5 minutes per batch.
- PFAS-Free (Per- and polyfluoroalkyl substances).
- RoHS compliant.
- Low Carbon footprint due to the low boiling point of (46°C).
- Energy efficient: No heated rinses or drying ovens required.
- Stable with no additives, no testing required.
- Consistent results: Continuous solvent distillation maintains purity.
- Minimal non-volatile residue (>10ppm).
- Very low surface tension for penetration into the micron level crevices and holes, efficient cleaning in tight to reach places and complex geometries.
- Easy process monitoring with minimal effort and minimal waste generation, easy reclamation for reuse.

- High Solvency (KB Value 98) for a variety of contaminants.

Safe for users and the environment

- Safe for the environment, zero Ozone Depletion Potential (ODP).
- GWP of less than 1, AR4 100yr Integrated Time Horizon (ITH).
- Non-flammable (No Flash Point).
- Not classified as a carcinogen.
- Non-hazardous for transportation.

Conclusion

As medical device production faces stricter environmental and regulatory demands, **ProSolv®5408e** offers a powerful, sustainable and technically advanced solution for critical cleaning applications. It delivers rapid, residue-free cleaning, broad material compatibility and low environmental impact, making it an ideal choice for manufacturers seeking to maintain the highest levels of cleanliness. **ProSolv®5408e** provides a rare combination of cleaning power, safety and regulatory alignment, allowing users to transition confidently away from high-impact or discontinued solvents without compromising performance.

About EnviroTech Europe

EnviroTech Europe develops and supplies advanced cleaning and surface-treatment products for critical and environmentally responsible applications. With decades of experience in the medical, aerospace and precision engineering sectors, we supply a comprehensive range of vapour degreasing and metal-treatment solutions, and our technical staff can offer advice on legislative changes which affect your industry.

EnviroTech Europe is a member of the Chemical Business Association and is accredited to ISO 9001:2015. All products are supplied and supported by EnviroTech Europe Ltd, manufactured in the United Kingdom and available on short delivery times through a dedicated team of distributors worldwide.

For more information please visit www.envirotech-europe.com

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Meeting the rigorous cleaning demands of the medical industry

MecWash Systems Ltd, based in Tewkesbury, Gloucestershire, is a leading manufacturer of industrial parts washing machines designed to meet the stringent cleanliness standards of the medical industry. With regulations in the healthcare sector requiring absolute precision in cleanliness, MecWash delivers tailored cleaning systems that ensure components are free from contamination, critical for patient safety and product performance.

Precision cleaning for surgical implants

MecWash has been working with medical implant manufacturers in Ireland for many years. A recent addition to its customer list is Croom Precision Medical, a specialist in manufacturing Class II and III medical implants. Croom chose MecWash's MWX400 system to enhance their component cleaning processes. These implants must meet the highest quality standards.

Croom rigorously tested the system to ensure effective removal of contaminants including oils, swarf and polishing compound. CEO Patrick Byrnes notes: "The MecWash machine meets all our requirements and more by delivering a controlled, validated outcome for each cycle. Operator interference is completely removed, which was a major win for our quality team."

John Pattison, managing director of MecWash, adds: "Croom's implants require extremely high precision and our technology ensures a reliable and repeatable cleaning process. The MWX400 has significantly improved both the speed and quality of their operations."

Long-term partnership with Advanex Europe

Advanex Europe first approached MecWash in 2012 seeking a cleaning solution for delicate medical components, such as medical coil springs and metal pressings used in Metered dose inhalers, auto injection systems and nasal sprays. The delicate composition of these products required a gentle cleaning process, in addition to guaranteed cleanliness. After successful trials, Advanex purchased an AVD 300 system featuring ultrasonic, flood and spray wash, hot air and vacuum drying and programmable rotation speeds.

Rob Newham, operations manager, explains: "We trialled several companies to achieve

improved cleanliness for our parts; MecWash was not only able to supply the most suitable equipment, but it also provided the correct chemical formulated to our specific requirements, achieving fantastic results that were beyond our expectations."

As production scaled, Advanex invested in additional MecWash systems: a Duo in 2018 and an MWX400 in 2024. "Each of the machines we have purchased from MecWash have provided us with a leap forward in efficiency. The MWX400 has made a substantial difference in the volume and speed of the parts washing. The previous MecWash machines exceeded our expectations and the MWX400 has done exactly the same," says Rob Newham.

Supporting medical manufacturing during the pandemic

The importance of clean manufacturing in healthcare was thrust into the spotlight during the COVID-19 pandemic. In 2020, MecWash supplied an AVD machine to BNOS Meditech,

a manufacturer of medical equipment, including medical gas regulators, flow meters and resuscitators, to help it meet the unprecedented surge in demand. Meditech played a key role in equipping Nightingale hospitals with these vital medical devices.

The AVD system significantly improved the efficiency of removing machining swarf and oils, allowing Meditech to rapidly increase production of resuscitators and oxygen regulators.

Duncan Riches, stores manager at Meditech, remarks: "At the busiest time we saw an increase in business of around two years' worth of orders in the space of 10 days and our existing ultrasonic washer couldn't cope with the demand.

"Our new MecWash machine takes a huge quantity of parts compared to our last one and the cleaning quality of the machine gives us full confidence that everything we produce is cleaned to the highest of standards."



Croom Precision Medical chose MecWash's MWX400 system to ensure effective removal of contaminants.

Engineering for the future of medical manufacturing

MecWash's reputation in the medical sector is built on technical precision and customer collaboration. Its systems are not only designed to meet strict cleanliness requirements, but they also feature smart technology for system monitoring and maintenance, reducing downtime and ensuring process consistency and optimisation.

"Our customers in the medical industry demand the highest standards," concludes John Pattison. "We work closely with them to design and build cleaning systems tailored to their specific manufacturing processes. Whether it's interstage cleaning or final cleaning, our technology ensures that each and every part meets the critical requirements of modern medical applications."

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



The MWX400 has provided a leap forward in efficiency for Advanex Europe.

World class parts washing technology

MecWash parts washers are used in the aerospace, automotive, defence, general engineering and medical industries. It specialises in achieving high cleanliness standards for components with intricate geometries, difficult substrates or tenacious contaminants. Its parts washers support the full

range of engineering processes, including machined castings, forgings, turned parts, pressings, extrusions and mouldings.

Mecwash Systems Ltd

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<https://www.mecwash.com>

Adelbert Haas grinding machines

Haas is a fast-growing company with a strong, respectable reputation among its customers and competitors. Testimony to Haas' growth and development, over 60 percent of the company's products and processes have been developed in just the last three years. However, there's also something to be said about the longevity and quality of Haas grinding machines—there are some on the German-based production floor from the 1950s which are still working and used today for specialist jobs.

Adelbert Haas CNC machines give you the confidence to manufacture top-quality products that have an appealing price per unit during production. The machines are brought and set up by a team of dedicated specialists to ensure that customers are up and running quickly and smoothly, so that you can start building your business and meeting the needs of your own customers.

Established in 1934 by Adelbert Haas, the company has gone from being one that builds universal grinding machines for local clockmakers, precision engineering and medical engineering industries, to being a global-player. Now, Adelbert Haas grinding machines can be

found on every continent and in a wide range of diverse and advanced industries.

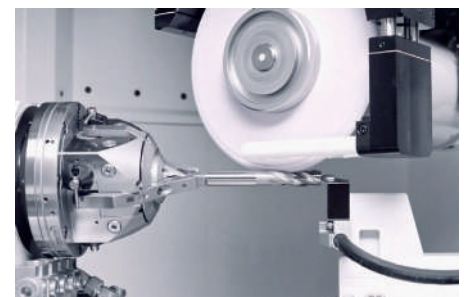
Today, research and development are vital to Adelbert Haas. Delivering perfection to its customers is the top priority. Experts from a number of disciplines, including engineers, computer scientists, mathematicians, technicians, CAD technicians and precision engineers work together to develop new grinding solutions and new grinding machines, as well as the software that runs them.

Adelbert Haas in the medical sector

Did you know that the pioneering technology behind Adelbert Haas machines propels the innovation and advancements of the medical industry? So much so, that 1.4 million knee joint implants are made every year with Adelbert Haas technology. Furthermore, Adelbert Haas grinding machines manufacture medical instruments and artificial hip joints as well, to name but a few.

Adelbert Haas in industry

Furthermore, the aviation and aerospace industries benefit from Adelbert Haas



advancements as well. Adelbert Haas grinding machines prove to be economical, efficient and environmentally friendly. Materials such as titanium, nickel superalloys, Inconel or tungsten-molybdenum alloys are hard to machine and typically pose major challenges. Adelbert Haas grinding machines have excellent surface quality and dimensional stability, making them perfect to overcome previous challenges efficiently.

UK Agent:

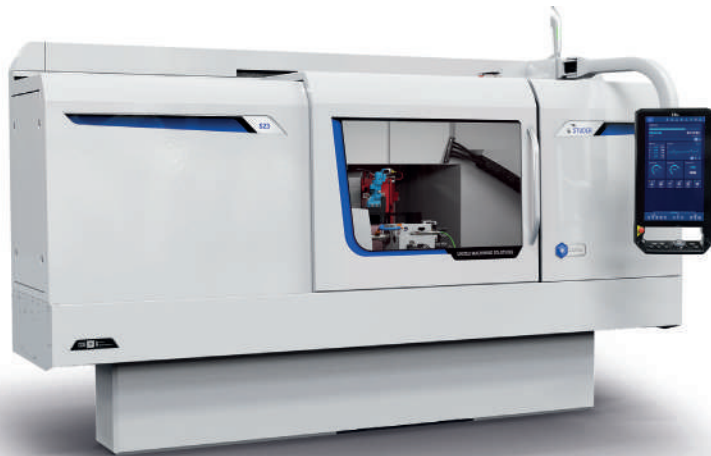
Kingsbury

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State-of-the-art grinding technology in a small space



STUDER S23 universal cylindrical grinding machine.

The S23 universal cylindrical grinding machine from STUDER offers high precision, great flexibility and modern grinding technology in a compact design at an attractive price-performance ratio. It was unveiled to the global public at the EMO trade fair in Hannover in September 2025.

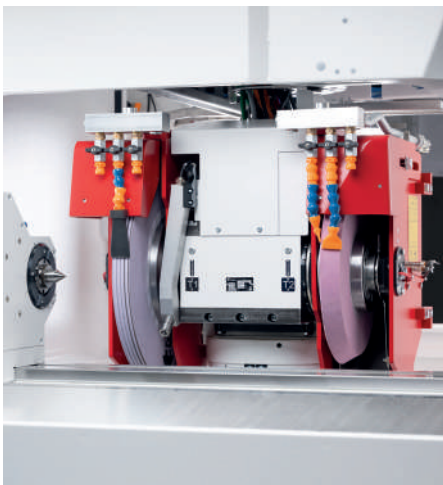
"Thanks to its high-quality features, precision and flexibility, the S23 complements our portfolio in the entry-level and premium segments," explains Sandro Bottazzo, CEO of Fritz Studer AG. With a compact footprint, the CNC universal cylindrical grinding machine offers state-of-the-art, reliable grinding technology. These include the modern C.O.R.E.

hardware and software architecture, an automatic B-axis with 1° Hirth coupling for up to three grinding tools, frequency-controlled motor spindles or belt drives and the machine base made of Granitan® with its outstanding thermal and vibration characteristics.

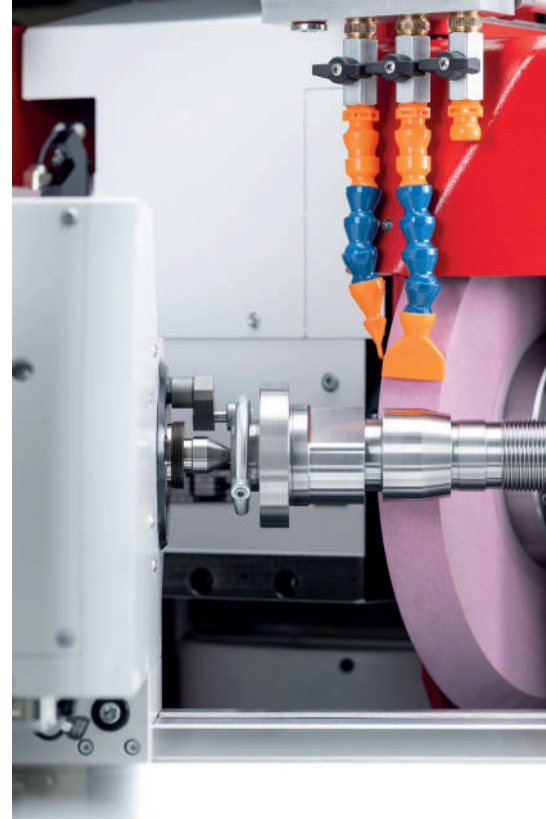
Customers also benefit from the innovative design that STUDER has developed for the S23. The arrangement of the wheelhead allows great versatility for the grinding tools in a single clamping, increasing efficiency, especially with geometrically complex workpieces. State-of-the-art grinding technology such as contact detection, semi-automatic balancing of the external grinding wheel and the optional in-process measuring system ensure high-quality results.

Optimal solution for a wide range of customers

This makes the S23 the ideal solution for a wide range of customers. With high accuracy and process reliability, it grinds small to medium-sized workpieces, even with complex geometries, in single and series production. "The S23 is ideal for production in the tool and die, automotive and supplier, aerospace and in the medical technology industries," explains STUDER sales manager Rolf Grossenbacher. In addition, customers have numerous configuration options for adapting the machine to their individual production requirements. These include a C-axis for thread and out-of-round grinding and an optional swiveling table.



Universal wheelhead Hirth 1° with automatic swivelling, with up to a maximum of three grinding tools.



Wheelhead swiveled to 30°.

Customer-specific adaptations are also possible.

Thanks to state-of-the-art digital technology and sensor technology, operation is simple and intuitive. After just a short introduction, employees can achieve reliable, high-quality results using the C.O.R.E. touch panel and StuderWIN software. Setup and changeover times are also minimal, thanks to the practical QuickSet function. Customers who want to automate their production can do so efficiently and economically thanks to the standardised loader interfaces for easyLoad and insertLoad. Of course, they benefit from STUDER's worldwide competent customer care and the experience of a traditional Swiss company with over 111 years of history. "This makes the S23 a high-precision universal cylindrical grinding machine with an excellent price-performance ratio," summarises Sandro Bottazzo.

The advantages of the S23

- Compact design.
- Distance between centres 650 mm/1,000 mm, 29.6"/39.4" and centre height 175 mm, 6.9".
- Automatically swiveling wheelhead, B-axis, for two external grinding wheels and one internal grinding wheel or a production wheelhead.
- Intuitive operation with C.O.R.E. and StuderWIN.
- Standardised automation with STUDER easyLoad and insertLoad as well as customised solutions.

Fritz Studer AG

Tel: 0041 334 391 111

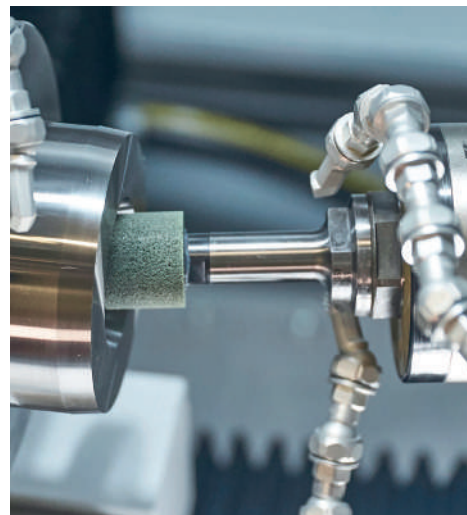
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The AGS line-up at EMO 2025: Automation, integration and precision

At EMO Hannover 2025, eight of Advanced Grinding Solutions' (AGS) principals presented a vision for the future of precision manufacturing, one defined by automation, process integration and sustainable, enhanced manufacturing. Across Hall 11, these companies demonstrated how grinding, polishing, filtration and finishing are converging into smarter, cleaner and more connected systems.

Automation as the new baseline

If one message dominated EMO 2025, it was that automation has become standard equipment. Danobat Group illustrated this through a broad range of innovations. Its dBOT CNC precision robot drew attention by combining the stability, stiffness and accuracy of a machine tool with the flexibility of a 6-axis robot, meaning the dBOT delivers three times greater pose and path accuracy than any alternative.

In finishing, R. Wick AG's MF66 and MF76 Magnetfinish systems applied fully robotic tool motion to deburring and flute polishing, achieving repeatable surfaces with zero manual input. Five visitors also won on 'spin the wheel' allowing their company to claim a free FANUC robot!



René Gerber's BS Power took a similar approach for edge-honing and polishing, integrating robotic handling in fully automatic machining cells for burr-free precision components. Across these exhibits, the shift from operator skill to automated consistency marked a clear shift in manufacturing outlooks.

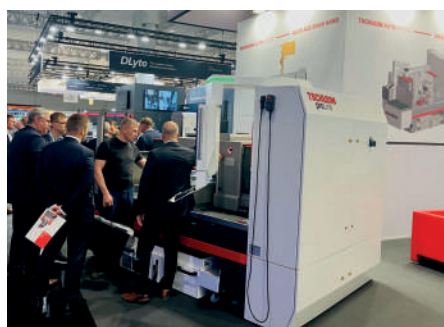
Integrated and flexible production

Another theme running through AGS's partner displays was integration and the merging of grinding, measurement, and handling into unified platforms. There was no better example of this than Danobat's new CGX, a versatile three-wheel configuration machine (2x OD and 1x ID) designed to handle everything from OD and ID grinding to threads and even complex non-round shapes. Meccanica Nova's modular machines demonstrated how similar



technologies can be applied to bearing production, also combining internal, external and combined grinding processes in a single setup, allowing faster changeovers and minimal downtime.

Swiss specialist Tschudin always bring innovation in flexibility and the CUBE 350 centreless grinders did not disappoint with the unique, patented technology such as the removable workrest blades enabling safe and efficient changeovers and part reloading that just is not possible with any other machines. It reduces operator error and safety while minimising the floorspace footprint.



Clean and sustainable processes

Sustainability is now inseparable from productivity, and AGS's portfolio showed how precision processes can also be environmentally responsible. GPA Innova, under its DLYte brand, unveiled an expanded

range of dry electropolishing systems, including the DLYte TurboFlow, PRO500 Lift, and 100PRO cell. The patented DryLyte process achieves mirror finishes below Ra 0.09 µm without liquids or abrasives, cutting waste while preserving geometry.

Likewise, filtration specialist Comat S.r.l. also demonstrated how cleaner operations drive both quality and sustainability. Its latest micro-filtration systems for neat cutting oils maintain cleanliness down to 3 µm through continuous monitoring and smart diagnostics. The result is extended oil life, reduced consumable waste and consistently improved surface finishes, proving that sustainability and precision go hand in hand.



Precision at the nano scale

At the ultra-fine end of finishing, FLP Microfinishing GmbH showcased its latest machines for fine grinding, lapping. Designed for planar and plan-parallel surfaces, they deliver micro- and nano-scale flatness for applications in optics, semiconductors and aerospace. With automation and closed-loop metrology, FLP demonstrated how even the most delicate processes can be industrialised without losing accuracy.

AGS: Bringing the future closer

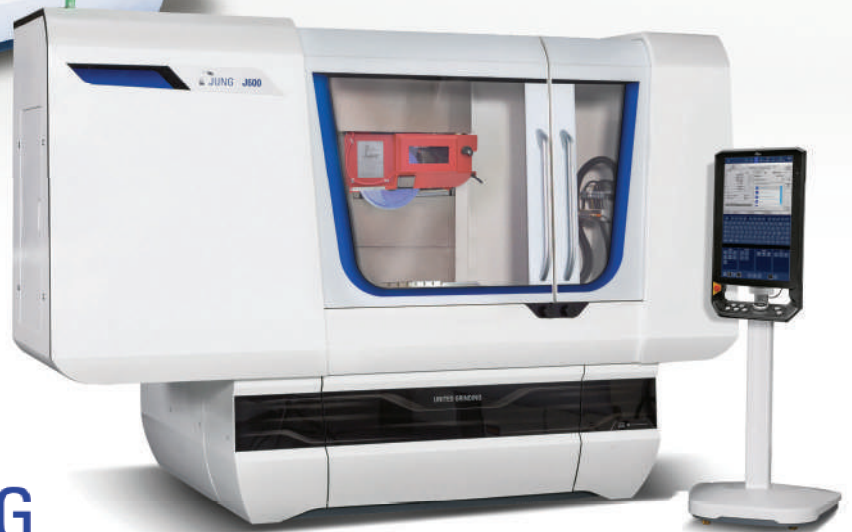
Together, these eight principals illustrated why Advanced Grinding Solutions continues to stand at the forefront of surface generation technology in the UK and Ireland. Their collective message from EMO 2025 was clear: grinding and finishing are no longer separate disciplines but part of a connected, automated ecosystem and through AGS, these innovations are already within reach of British manufacturers determined to compete at the highest level of precision.

Advanced Grinding Solutions

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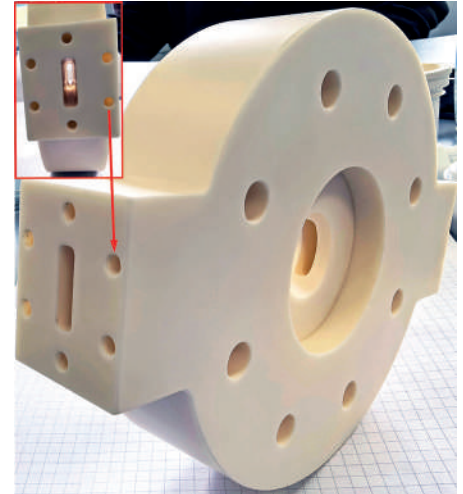
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Milling as well as grinding of ultra-hard ceramics in one setup



Industrial ceramics are essential in many high-performance applications due to their exceptional hardness, thermal stability and chemical resistance. However, their extreme hardness, up to 1800 HV (Vickers hardness), makes machining after sintering nearly impossible except by grinding, which is a relatively expensive process and limits geometric complexity of the component being produced.

BCE Special Ceramics GmbH in Mannheim has now successfully broken this barrier using a high-speed, 42,000 rpm, Roeders RXP 501 DS trunnion-type, 5-axis machining centre. It is achieving the required micron-levels of precision by milling as well as grinding, reducing cost and allowing more sophisticated

machined features. Hurco Europe, the UK and Ireland agent for the German machine manufacturer, describes the technological advance.

Founded in 1986, BCE specialises in high-precision components made from ceramics such as aluminium oxide, zirconia, and composite ceramics like ATZ (Alumina Toughened Zirconia (ATZ) and Zirconia Toughened Alumina). The company serves industries ranging from medical to aerospace, producing custom parts from single prototypes to medium-size series. Larger volumes are outsourced to specialist partners.

Each application is developed in collaboration with the customer's R&D team. The process begins by selecting the optimal ceramic material, sometimes modified with additives for enhanced properties like conductivity, or compatibility with metals and plastics.

Production in Mannheim begins with pressing a ceramic powder mixed with a small amount of organic binder into a green compact. This fragile but machinable part is strengthened through cold isostatic pressing at around 2,000 bar. It is still relatively soft and must be oversized by about 20 percent to compensate for shrinkage during sintering.

Subsequent firing at a temperature between

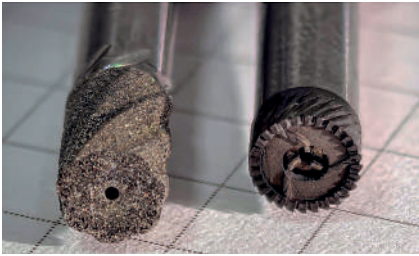
1,300°C and 2,000°C removes the binder and fuses the ceramic particles into a dense, durable structure with only 0.5 percent porosity. After sintering, these ceramics possess outstanding hardness, chemical resistance and temperature tolerance down to absolute zero. However, their hardness presents a machining challenge.

Historically, grinding was the primary method for machining sintered ceramics, especially when precise sizing was needed. In BCE's applications, for simpler 2D and 2.5D geometries, predefined grinding cycles using mounted points exchanged from the tool magazine are frequently used. Milling cutters and drills are utilised for more intricate 3D geometries and free-form surfaces that are difficult or unfeasible to grind.

Dr Torsten Prescher, application engineer at BCE says: "When we researched the market for machining centre platforms able to mill as well as grind our ceramic materials, Roeders stood out for its in-house development of control systems and machine components, which allow unmatched contouring accuracy. The roundness of our machined holes is to within one micron, for example."

Roeders machining centres use direct drives, robust linear guideways and protective sealing to avoid ingress of abrasive ceramic dust. Both manual and CAD/CAM programming is supported, allowing operators to choose the most efficient workflow. The machine is supplied with built-in grinding cycles, a dressing spindle and acoustic sensors for process monitoring. Through-tool cooling of the cutting zone using an emulsion at pressures up to 80





bar ensures tool longevity and machining accuracy, which are particularly important when using small-diameter tools.

BCE partnered with high-performance tool manufacturer Zecha to

address the challenges of milling ultra-hard ceramics. It supplied custom Polycrystalline Diamond (PCD) and diamond-coated carbide tools designed for high-wear, high-precision requirements.

Fabian Henning, a mechanical engineer at the Mannheim factory, despite coming from a Siemens control background, found the Roeders system intuitive to operate. For simpler 2D and 2.5D components, he often programs NC grinding sequences directly at the machine.

The Roeders control not only uses its own grinding cycles but also retrieves parameters from an internal machining database to speed programming. For more complex geometries, Fabian Henning uses a seat of VISI CAM to create 3- or 5-axis milling cycles.

He says: "Machine reliability and after-sales service were key for us when selecting the machine. In three years, we've only had one breakdown, a defective sensor which was replaced the following day."

BCE's managing director Dr Torsten Weiss adds: "Machining systems we looked at from other potential suppliers were capable of milling green parts, but they proved inadequate for high-precision 5-axis machining of fired ceramics.

"The existence of approximately 50 Roeders machines already in use around the world for various ceramic machining tasks also provided a convincing reference.

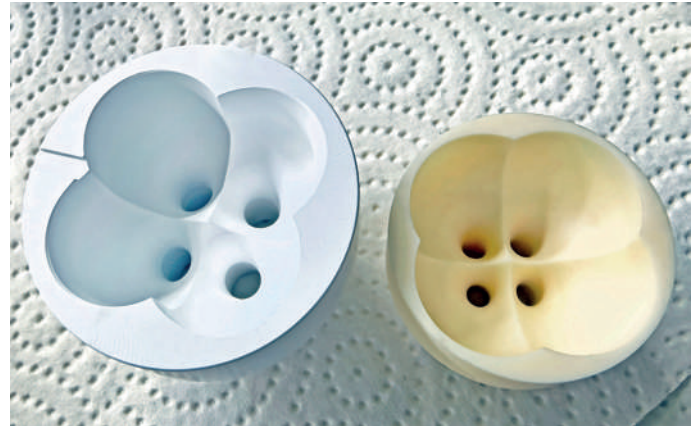
"The decision to invest in Roeders has been pivotal to our business. We can now machine sintered ceramics into geometries previously unheard of, with exceptional precision and significantly lower production costs."

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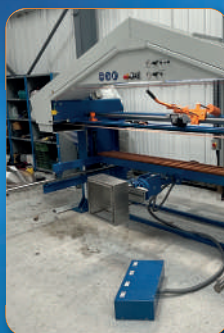
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- Extensive range of options
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Defying the global situation with a strong corporate strategy

Interview with Carsten Liske, CEO of Kellenberger



Carsten Liske, CEO of Kellenberger.

How do you see Kellenberger positioned for the future?

Let me begin by briefly outlining the decision-making levels at Kellenberger: at the top is the board of directors, of which I am a member alongside the representatives of our shareholder. Within this body, we have defined, through the transformation program 'ONE Kellenberger', the strategy for a successful future for all Kellenberger sites worldwide. We are a global player and must act as such. Our regional presidents know their respective markets very well and can implement the objectives precisely there. Together, these executives form our global leadership team.

As CEO, I see my task as bringing our strategy to life in day-to-day business and, among other things, driving the integration and expansion of new technologies. In doing so, we are continuing what has already been started in recent years including the introduction of turning and milling technologies as well as the construction of our new company headquarters here in Goldach.

With myself and our CFO Norbert Finger now based in Goldach, the company's headquarters were relocated from the United States to Switzerland. Here, in the new plant, that we have put into operation two years ago, we manufacture our European premium products. From the very beginning, sufficient production

space was planned into the construction to allow for future growth and that is exactly what we will continue to pursue.

The global situation is not exactly easy at the moment with the important automotive and mechanical engineering sectors in particular struggling worldwide. To what extent is optimism nevertheless justified?

Of course, geopolitical upheavals affect global trade, cause disruptions in supply chains and impact market stability. The U.S. president's tariff policy is not exactly helpful either. We draw our strength from our position as a global player. Building on our more than 100-year history, Kellenberger today ranks among the most successful precision engineering machine manufacturers. For decades, we have been present with major production sites in the three regions of Europe, North America and China. These sites operate independently in their daily business and also develop their own product lines, tailored to the respective markets. This allows us to offset challenges that may arise in individual markets. In today's relevant market segments, we are not only technologically well positioned but have also earned the trust of our customers over many years.

In China, we have been present as a manufacturer for more than 30 years and our highly capable team there builds machines

specifically developed for the Chinese market and its requirements. We already serve many customers in important future-oriented industries such as medical technology, where they rely on the high precision of our machines.

We have also adapted to the specific customer requirements of the American market. For decades, our modular USACH machines have served the market for special solutions, for example in the aerospace and semiconductor industries. The U.S. market, particularly in aerospace, is a growing market of the future.

With our Kellenberger U-machines, we offer aircraft manufacturers and operators customised solutions, for instance for machining landing gear components or aircraft engine parts.

At the same time, it is equally important for us to continuously tap into new markets and segments. We currently see great growth potential in the ROW region, meaning Asian countries outside China. We will therefore intensify our activities especially in India and Southeast Asia. To this end, we are establishing a regional head office for sales, service and application' in Kuala Lumpur, Malaysia, which will also manage our site in Bangalore, India. We observe that some competitors are withdrawing from these regions, which in my view is a missed growth opportunity.



The Kellenberger portfolio has so far been divided into brands, including well-known names such as Voumard and Hauser. These brand names will now be phased out. Isn't that confusing for customers, at least where existing installations are concerned?

We are, of course, fully aware of the importance of the brands in our portfolio. Voumard, for example, was one of the pioneers in internal grinding technology and was market leader in Europe, if not worldwide, for decades. Even today, the precision of these machines sets standards. To ensure that this remains the case, we have not only continuously developed the Voumard machines in recent years, but completely redesigned them. Today, these machines are marketed as Kellenberger VM machines. The same applies to Hauser machines in the field of jig grinding, which in the future will be integrated into the Kellenberger H-series. We use the original brand names as abbreviations, among other things, to indicate the respective technology. For example, Kellenberger machines representing external grinding technology are now logically called Kellenberger K-machines.

Naturally, there are already thousands of our machines on the market that still carry the old designations. This is why I would like to



highlight another area that offers great growth potential for us and which we are actively expanding, retrofit. There are thousands of Voumard machines in operation worldwide, many of which are now aging and therefore require refurbishment or even a complete retrofit in order to continue delivering top-level results. Such overhauls are always worthwhile, as they restore the machines to the highest levels of precision and competitiveness.

The KELLENBERGER K1000 and its predecessor models KEL-Varia and VARIA, of which several thousand units have been delivered worldwide, are also ideal for retrofit and thus for a 'second machine life.' A well-known spindle manufacturer, for example, operates over 100 machines from our company and continues to invest with us. Thirty of these machines are now undergoing a comprehensive retrofit. The important point is this: all our machines are designed to be energy and resource-efficient, contributing to low lifecycle costs thanks to high-quality and durable components. Moreover, due to their modular design, it is significantly easier to replace components when wear occurs, essentially allowing the machine to be 'retrofitted' as needed. As always, everything is done with the customer's best interest in mind.

The interview was conducted by Andrea Jäger, freelance journalist from Germany.

UK Agent

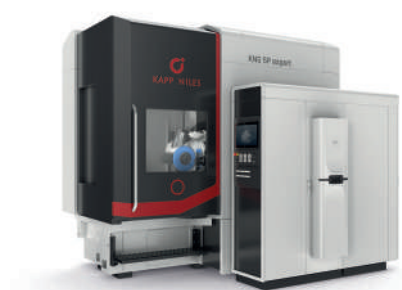
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KAPP NILES presents new profile grinding machine



High flexibility in a compact design: The new KNG 5P expert profile grinding machine from KAPP NILES is ideal for the precise machining of external and internal gear teeth. As a next level development of the successful ZE series, it combines the advantages of the previous model with enhanced features. "The KNG 5P expert can be used for a wide variety of applications and enables efficient work with excellent gear quality," emphasises KAPP NILES product specialist Boris Maschirow.

Ergonomic handling

The KNG 5P expert is characterised by its outstanding setup efficiency. To change the

diamond dressing tool, the direct driven dressing spindle swivels into an ergonomic accessible position. Dressing tools can thus be conveniently changed from outside the machine.

The optimised tailstock features a stroke of 850 mm and a swivelling mounted tailstock with adjustable pressure up to 2,000 N significantly extend the range of applications for clamping between centres.

Wide range of applications

From gear wheels to pinion shafts and worms, the KNG 5P expert can grind a wide variety of workpieces with a face width of up to 670 mm. The powerful grinding spindle is direct driven with speeds of up to 9,500 rpm and drive torque of up to 64 Nm. This allows the use of grinding wheels with diameters ranging from 60 to 350 mm.

The 400 mm diameter rotary table is a direct drive solution and features a deep bore for long shafts. Despite its extremely wide range of applications and sturdy main components, the machine has a small footprint thanks to its compact design.

Additional options

Complex modifications can be produced efficiently and almost twist-free by means of double-flank grinding on the KNG 5P expert thanks to 5-axis interpolated grinding via an open swivelling axis. For grinding worms, the dressing arm swivels completely out of the working area of the grinding slide, allowing the full stroke of 675 mm to be used.

The machine can be equipped with automatically CNC-controlled cooling lubricant nozzles. In addition, the KNG 5P expert can be optioned with a loading hatch for automated loading of the machine.

Boris Maschirow concludes: "With the KNG 5P expert, we are consistently continuing our long-standing successful ZE series. In addition to all the advantages of this proven series, the profile grinding machine impresses with additional and new features that offer the user maximum flexibility."

KAPP NILES

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Mirka acquires Hermes Abrasive's Bonded Abrasives division

Leading manufacturer of surface finishing and industrial solutions, Mirka Ltd has announced the acquisition of all bonded conventional abrasive wheels assets of leading manufacturer Hermes Schleifmittel GmbH.

The asset purchase deal, signed in Hamburg, Germany on 1st September 2025, includes the bonded abrasives factory in Uetersen, all assets, inventory and staff related to the bonded business area in Germany and internationally. The acquisition is an integral part of Mirka's strategy to expand the business and product portfolio in the field of precision grinding.

Mirka has systematically developed its portfolio in the area of precision grinding since 2013, when the company built a dedicated production line for micro grit flexible abrasives for polishing and lapping applications. In 2017, Mirka acquired the superabrasive wheel manufacturer Cafo in Italy, followed by dressing roll manufacturer URMA Rolls in 2021.

With the addition of Hermes bonded conventional wheels, which supplement Mirka's

diamond and CBN wheel range, the basic portfolio is now complete.

"Finally, after years of building up the portfolio, we now have a broad, comprehensive and very competitive offering in precision grinding that can serve the most demanding grinding applications," says Mirka's CEO, Stefan Sjöberg. "We are really excited about this opportunity and the synergies it brings to our offering."

Conventional bonded abrasives are used in various industrial applications, such as the precision grinding of metal parts and the manufacturing and servicing of gearboxes, bearings, turbine parts and other components for the energy and aerospace sectors.

Uetersen will become Mirka's competence centre for bonded conventional abrasives. Integration into the Mirka organisation will begin immediately and development and investment needs will be reviewed and actioned.

"Operations and deliveries in Uetersen will

continue uninterrupted. Bonded abrasives products are critical to our customers' operations and we can now secure the supply to our key customers and see how we can serve them even better," CEO Stefan Sjöberg concludes.

The Finnish family-owned company Mirka Ltd is a leader in surface finishing technology and offers a broad range of ground-breaking sanding solutions for the precision industry. Our premium sanding and polishing products and innovative power tools provide real benefits to customers in efficiency, surface finish quality, and cost-effectiveness.

Mirka has approximately 1,600 employees in 19 subsidiaries in Europe, the Middle East, North and South America, and Asia. Its headquarters and main production facilities are in Finland, additionally, bonded abrasives production is located in Italy.

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Master Abrasives and Molemab announce new partnership in UK and Ireland

Midlands-based Master Abrasives has been appointed as the official representative for Molemab's abrasives in the UK and Ireland. Molemab S.p.A., an Italian-based global expert in abrasive manufacturing, brings a wide-ranging portfolio of high-quality conventional and superabrasive products to the partnership.

This new collaboration aligns with Master Abrasives' ongoing strategy to deliver complete abrasive solutions through a mix of trusted partner brands and its own Master-branded range.

"This is a great addition to the comprehensive portfolio of Master Abrasives," comments Paul Batson, managing director of Master Abrasives. "It will give both companies the opportunity to further support and develop new and existing markets. Ultimately, we aim to provide customers with effective solutions to their grinding challenges or simply help improve their productivity."

Headquartered in Italy, Molemab is a globally respected, family-owned business specialising in the production of abrasive tools for a variety of demanding sectors including aerospace, metalworking, automotive, and woodworking.

"Molemab is a globally renowned, family-owned business specialising in high-quality abrasive solutions," says Fedele Bertarelli, sales & technical manager at Molemab. "The partnership with Master Abrasives is ideal, there is a great synergy between the two companies."

Molemab's product portfolio includes a broad selection of conventional grinding wheels made from aluminium oxide, ceramic and silicon carbide grains, as well as vitrified bonded solutions designed for specialised applications such as creep feed and gear grinding in aerospace.

Additionally, Molemab holds a strong reputation in the superabrasives market, offering a full range of CBN and diamond grinding wheels in all bonding systems. Its product catalogue is engineered to meet the specific needs of professional users across industries and is available to view in full on their website.

Master Abrasives, known for its technical expertise and focus on delivering value through performance, supports customers in the aerospace, automotive, medical, fabrication and general engineering sectors. The company is dedicated to providing products that meet high standards of durability and efficiency in surface preparation, material removal and finishing processes.

By partnering with Molemab, Master Abrasives strengthens its ability to offer top-tier abrasive solutions, combining Italian craftsmanship with advanced technology and customer-focused service.

With shared values in quality and customer satisfaction, this partnership ensures that customers across the UK and Ireland will benefit from an even broader range of abrasive technologies supported by local technical expertise.



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Mirka® DEROS RS 600 is a rotary sander designed for heavy-duty, coarse sanding applications. Its lightweight, compact design provides a smooth operation and enhances user comfort and productivity.

For further information or to arrange a demonstration, please contact Customer Services on **01908 866100**.



Find out more at www.mirka.co.uk

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Weiler Abrasives introduces Metalynx 3D MAX ceramic resin fibre discs

Featuring precision-shaped grain designed for maximum performance on the toughest metals

Weiler Abrasives, a leading producer of abrasives and power brushes for surface conditioning, has announced its new Metalynx 3D MAX Ceramic resin fibre discs, abrasive products built for superior cut rate and durability in even the toughest applications. This addition to the Metalynx portfolio provides a maximum performance grinding solution for general metal fabrication and industries that require multi-pass welding, such as shipbuilding, pressure vessel and heavy equipment fabrication.

"This cutting-edge grain technology is designed for maximum cut rate and material removal to boost throughput and reduce operator fatigue," says Uroš Filipič, product manager, Weiler Abrasives. "This allows operators to reduce changeovers and finish their work faster. These discs work harder, so operators don't have to."

Using 3D precision-shaped grain, the discs deliver exceptional cut rate, durability and cool grinding for maximum productivity. The grain stands upright, allowing for effortless metal removal. Additionally, the design provides optimised grain retention that extends disc life, reducing changeovers to save operations time and money. The micro-fracturing technology and 3D shape make the work easier because less force is needed when grinding. They can be used on materials including steel, stainless steel, high-nickel alloys, armored steel, tool steel, Inconel and titanium.

Extensive testing shows the new Metalynx 3D MAX Ceramic discs deliver improved product life while providing fast cutting speed. The discs are also contaminant-free, so they are safe for use on stainless steel parts.

In addition to Metalynx 3D MAX, standard ceramic alumina grain resin fibre discs have been added to the product offering under the Weiler brand. This new option provides a high-performance solution that complements the existing Zirconia (Zirc) and Aluminum Oxide (AO) tiers, so users can choose the performance level that best meets their needs.

Weiler's commitment to excellence and customer satisfaction goes beyond a sharp product. It is a strategic partner dedicated to helping operations achieve their goals. Learn more about how the new Metalynx 3D MAX Ceramic resin fibre discs from Weiler Abrasives



can improve performance and productivity at: <https://www.weilerabrasives.com/3dmax-abrasives-longer-life>

Weiler Abrasives announces new vice president of technology and product development

Weiler Abrasives has announced the appointment of Dr Ingo Kuhl as vice president of technology and product development. In this role, he will lead Weiler's global efforts to design and deliver the next generation of value-added products that help customers improve productivity, safety and performance across essential industries.

"We are thrilled to welcome Ingo to the Weiler team," said AJ Roshan, president and CEO of Weiler Abrasives. "He brings a unique blend of technical depth, customer awareness and strategic vision that aligns perfectly with our mission. As we look to the future, we see increasing demand for solutions tailored to the specific challenges of our customers. Ingo's leadership will be instrumental as we continue to expand our investment in product development and customer support worldwide."

Weiler Abrasives continues to advance its mission of creating distinctive value through collaboration and innovation. Guided by its strategic plan, the company is expanding its product portfolio and developing solutions that address the most demanding applications in

critical industries, from metal fabrication to engineered surface management.

Dr Ingo Kuhl brings over 20 years of global experience in the abrasives and materials industry. Most recently, he served as managing director at Krebs & Riedel, where he oversaw R&D, production, quality and international expansion initiatives in China and India. Previously, he led research groups at RWTH Aachen University and held senior technical and production roles at Rüggeberg and Alfons Schmeier. He holds a Doctorate in metallurgy and materials engineering from RWTH Aachen University and has led numerous research collaborations with academic and industrial partners.

With his appointment, Weiler strengthens its commitment to innovation and reinforces its position as a trusted partner for surface conditioning excellence worldwide.

As an industry leader and global manufacturer of surface conditioning solutions, Weiler Abrasives Group is dedicated to forging collaborative relationships with its customers in diverse markets to tackle their toughest cleaning, grinding, cutting, deburring and finishing challenges.

WEILER Abrasives d.o.o

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BEYOND SHARP

Metalynx 3D MAX ceramic resin fiber discs are built for maximum performance on the toughest metals. Featuring 3D precision-shaped grain, they deliver exceptional cut rate, durability, and cool grinding for maximum productivity. Designed to boost throughput and reduce operator fatigue, these discs help finish your work faster.



LEVEL UP YOUR OPERATION:
Contact us to test 3D MAX.



emea.weilerabrasives.com



Saint-Gobain Abrasives publishes the world's first EPDs for abrasive products

Saint-Gobain Abrasives has published the world's first Environmental Product Declarations (EPDs) for abrasive products. This groundbreaking sustainability milestone is achieved through Norton cutting and grinding discs.

As part of its ongoing commitment to responsible innovation, the company is proud to lead the industry with a major achievement in sustainable manufacturing: the first-ever published EPDs for abrasive products worldwide, covering a selection of cutting and grinding discs from the Norton brand.

These products incorporate a minimum of 14 percent recycled materials and are engineered to deliver exceptional performance while supporting a more sustainable future. Initially, a comparative study was conducted between the previous formula and the new one, now including recycled grains, to validate its performance and confirm a reduced carbon footprint. The EPDs provide customers and partners clear, reliable data to make informed decisions aligned with their own environmental goals.

These publications are more than a company milestone; they are a global industry first. Following extensive, collaborative efforts across the abrasives sector, the Product Category Rules (PCRs) for abrasives were officially published in June 2024. These PCRs establish the standardised framework for how EPDs in the abrasives industry are developed and communicated.

This achievement reflects Saint-Gobain's strong dedication to environmental transparency, reducing its carbon footprint thanks to the inclusion of recycled materials inside each disc and reaffirms its leadership in driving sustainability across the abrasives industry.

What is an EPD?

An Environmental Product Declaration (EPD) is a third-party verified document that provides objective, comparable and transparent data about a product's environmental impact throughout its life cycle.

Through a complete Life Cycle Assessment (LCA), Saint-Gobain measures environmental footprints of its products, from raw material extraction to end-of-life and make this information publicly available via an EPD.



It's a clear commitment to reduce its environmental footprint and communicate transparently about the environmental performance of its solutions.

Which products have an EPD certification?

The six EPDs cover a selection of cutting discs from the Norton range, developed for the DIY market in the EMEA region. These discs offer exceptional performance for cutting steel, stainless steel and multi-materials.

The certified products include:

Norton® Expert Battery Pro

Ideal for use with cordless angle grinders, with a 1.0 mm profile these thin, lightweight and easy-to-handle discs provide fast, precise cuts while preserving battery life.

Norton® Expert Faster Pro

At 1.3 mm thick, these discs balance cutting speed and safety. The self-sharpening zirconia grain ensures long-lasting performance, especially on stainless steel.

Norton® Expert Stronger Pro - Inox

Featuring a thicker profile and additional internal reinforcements, these discs offer a dual function: cutting and grinding with one single product.

Norton® Expert Stronger Pro - Multi Material

Based on the same technology as the Stronger Pro Inox, these versatile discs are designed to cut and grind various materials including metal, stainless steel, stone, PVC, aluminum, ceramic and tiles.

Norton® Travaux Extrêmes Blue Pro - Inox

This high-end range is for the French DIY

market. These cutting discs incorporate the latest technological advancements and are optimised for steel and stainless steel.

Norton® Travaux Extrêmes Blue Pro – Multi Materials

Based on the same technology as the Blue Pro Inox, these ultra-versatile discs deliver effective cutting performance across a wide range of materials, offering durability, precision and comfort.

Where can you find the EPDs?

The EPDs are available on the New Generation Cutting & Grinding Disc product page of the Norton website and directly on the official Environdec platform, the international system for environmental product declarations.

Aldric Barbier, director for sustainability and product compliance says: "These first EPD certifications mark a major milestone in our sustainability strategy. They reflect our concrete commitment to reducing our environmental footprint and set an example for the industry."

"We are proud to be the first abrasive manufacturer worldwide to publish EPDs based on the newly established Product Category Rules (PCRs) and this is just the beginning. We will continue expanding certifications across our product ranges and driving progress toward a more sustainable future."

Norton | Saint-Gobain Abrasives

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Making grinding work easier with 3M Cubitron 3 Abrasives



About the company

Specialising in industrial hard chrome plating for engineering applications on cast steel and stellite alloy substrates, Reddish Electroplating had a time- and finish-critical process. It wanted to optimise this in order to satisfy its increasing workload, while maintaining the high finish standards that it has become known for amongst its customer base.

The challenge

Graham Hanks, production manager, needed to find a faster way of removing the topcoat, machine marks and welds down to sound metal before the chrome plating and subsequent finishing steps could be completed. The substrates they use are particularly hard to grind fast with speed and consistency.

The solution

With support from a 3M process specialist, Graham Hanks oversaw a trial of 3M™ Cubitron™ 3 Fibre Discs on the 3M™ 1900W Angle Grinder and 3M™ Cubitron™ 3 Cloth Belts on his existing portable belt machines. The patented grain technology meant that even on these hard-to-grind substrates, the work got done faster and the scratch pattern left behind was more than good enough to chrome plate and polish to the desired finish specification.

Product impact

• 60 percent less abrasives used.
Here's what Graham Hanks had to say: "Tom is one of our most experienced metalworkers and his feedback was critical in our assessment of

the trial. Once we saw the significant increase in through-put these products are capable of delivering, without compromising on our commitment to quality, we quickly realised we couldn't afford to use anything else but Cubitron 3. We now get twice the work done in half the time and the products are lasting at least twice as long. Cubitron 3 has transformed our process and supports our commitment to quality work.

"It's really helped make the grinding work easier as the abrasive disc is clearly working faster. The motor filter has reduced the amount of grinding debris getting into the motor, increasing its service life. We quickly realised we couldn't afford to use anything else but 3M™ Cubitron™ 3."

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Cubitron™ 3
Performance Abrasives

Produce more. With less.

3M™ Cubitron™ 3 Fibre Discs, 36+, 60+, 80+

Ideal for heavy grinding applications.

By using long-lasting, fast-cutting 3M™ Cubitron™ 3 Performance Abrasives, you can minimize abrasive changeover to save money over time. Stiff fibre backing and a strong resin bond provide durability and tear-resistance for heavy grinding applications from beveling, weld grinding, surface grinding to deburring, and flame cut smoothing. In each application the product grinds more freely and at lower temperatures, helping to reduce job times, operator fatigue and minimize rework.



More total material removed



Less operator fatigue



Faster cut rate



Sustainability at the core



Less Vibration exposure



Cool cutting

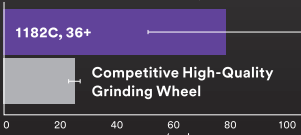
New

3M™ Cubitron™ 3 Fibre Disc 1182C

Grade **36+**

Up to **3x** Faster initial cut rate¹

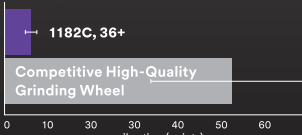
Productivity Delivered



grams/cycle

Up to **88%** Less vibration exposure¹

Safety Built In



vibration (points)

Error bars represent the results with a 95% confidence level.

1 Performance testing in a typical weld preparation process; 3M™ Cubitron™ 3 Fibre disc average compared to the average result of 10 globally available high-quality competitive shape type-27 Grinding wheels including ceramic grain products, according to independent testing by Fraunhofer Institute. January 2024

Grinding & Surface Finishing | November 2025 | 21

Efficient grinding with VSM long-term abrasives

In industrial surface grinding, quality and efficiency are paramount. Especially when grinding coils, where large quantities of material are processed continuously, process stability and service life are crucial factors. Each tool change not only means a production stop but can also result in visible marks being left on the surface, an undesirable effect that must be avoided.

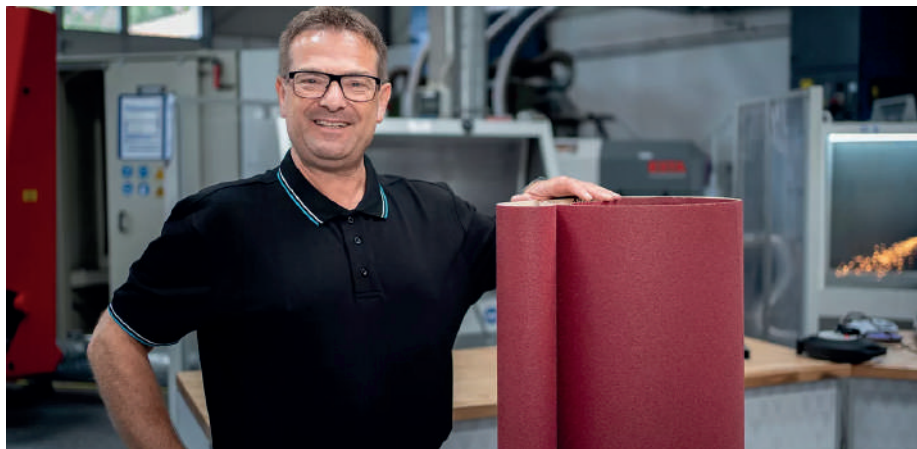
The COMPACTGRAIN series offers the optimal solution. Since the 1970s, the product range has been valued for its exceptionally long service life, constant stock removal rates and consistent surface quality over the entire service life. Thanks to the high performance of these products the metalworking industry has relied on this technology for decades, for efficient, uninterrupted grinding without any noticeable quality fluctuations.

Reliable grinding processes with VSM COMPACTGRAIN

Efficient grinding processes require reliable abrasives with constant performance and a long service life. The VSM COMPACTGRAIN series has been fulfilling this need since 1978. The multi-layer long-term abrasives are made up of a granulate that contains numerous abrasive grains. Used grains are broken out by the grinding forces to expose sharp, unused grain tips. As a result, the stock removal remains constant and the surface quality uniform over almost the entire service life. The extended service life also reduces the frequency of belt changes, minimising downtime and optimising the production process.

Optimised performance with VSM COMPACTGRAIN Plus

Launched in 2018, the VSM COMPACTGRAIN Plus series goes one step further. An optimised grain reserve and improved bonding properties ensure more even wear. The granulate in the multi-layer abrasive is utilised completely, which further extends the service life. Compared to the COMPACTGRAIN series, COMPACTGRAIN Plus is more aggressive, which increases stock removal. The higher stock removal rate allows feed rates to be increased. Throughput times are reduced and faults can be ground out faster. This reduces the need for rework and increases productivity. VSM offers a large portfolio with various series



that differ in flexibility, stock removal rate, wear properties and coating density. Within the COMPACTGRAIN and COMPACTGRAIN Plus product families, there are a total of 24 variants to choose from, most with a fabric backing and some with paper backings or vulcanised fibre. They are available in grit sizes from 60 to 1200, making them ideal for a wide range of applications, including wet grinding.

Maximum productivity and consistent quality in cylindrical grinding

Efficient grinding processes require high-performance abrasives with constant stock removal rates and a long service life. This is precisely where KK790Y - VSM COMPACTGRAIN Plus comes in. This long-term abrasive has a particularly large grain reserve and a continuous self-sharpening effect, which keeps stock removal constant and the surface quality uniform over the entire service life. KK790Y has been specially developed for applications with high contact pressures, such as centreless grinding of tubes and rods, or wire grinding on planetary grinding machines. Improved bonding ensures full utilisation of the granulate, while the significantly larger granulate further extends the service life of the belts.

KK790Y has demonstrated its performance impressively in practice: When grinding stainless steel tubes on a four-station grinding machine with grit sizes 120, 180, 240 and 320, the results were double those of the previous competitor product as 460 tubes were ground instead of only 230.

The ability to increase the feed rate optimises production processes. Fewer belt changes



reduce grinding costs and ensure higher process stability. With KK790Y, VSM offers a powerful solution for precise cylindrical grinding applications where consistent quality and efficiency are crucial.

Glossy surfaces with CK772T

In a field test, VSM COMPACTGRAIN CK772T in grit size 400 was used to grind a stainless steel container. The result: a homogeneous and glossy surface.

CK772T uses easily degradable grain reserves made of silicon carbide. This results in a long service life and uniform surface roughness. Compared to conventional abrasives, CK772T needs significantly fewer abrasive belt changes. This increases efficiency and reduces operating costs. CK772T also achieves excellent results in applications with soft contact elements or low contact pressure. The continuous self-sharpening ensures stable stock removal and extends the service life of the abrasive.

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Klingspor expands its product range

Klingspor, one of the leading manufacturers of high-quality abrasives, has set a milestone in surface finishing technology with the introduction of the new grinding disc A 624 Supra. The new grinding disc is characterised by its practical 2-layer structure, which guarantees a combination of extra-long service life and high aggressiveness.

The A 624 Supra has been specially developed for the highest demands and fulfils the requirements of demanding users in industry and trade. Thanks to the 2-layer structure of the disc, not only is the material removal rate maximised, but wear is also considerably reduced. This leads to significant cost savings, as the disc needs to be changed much less frequently. The A 624 Supra is ideal for processing steel and stainless steel and offers professional solutions for a wide range of grinding applications.

The two-layer structure of the A 624 Supra combines two specially harmonised material layers that ensure outstanding performance values. The lower abrasive layer is optimised for maximum aggressiveness and fast material removal, while the upper top layer ensures an extended service life thanks to high wear resistance. This design makes it possible to

optimally combine the advantages of both layers and thus ensure consistent performance even under intensive use. In tests, the A 624 Supra was able to impress with around four times the service life of conventional grinding discs with a consistently high stock removal rate.

With the introduction of the A 624 Supra, Klingspor has added another high-performance solution to its willingly extensive product range of grinding discs. This new development illustrates the company's strategic orientation of consistently focussing on customer needs and continuously developing its machining technologies. The new grinding disc is part of the proven Supra product line, which stands for uncompromising performance and efficiency. Klingspor thus underscores its position as an innovation leader characterised by continuous research and development. With products such as the A 624 Supra, the company offers professional users worldwide high-performance tools for demanding machining tasks.

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Innovations in Vitrified Bond Technology

Grinding wheels play a fundamental role in the manufacturing industry, ensuring precision, efficiency, and performance in countless applications. One of the crucial components that significantly influences the efficiency of grinding wheels is vitrified bond technology.

Traditionally, vitrified bonds have provided superior strength, thermal stability, and durability. However, there have been many advancements in this sector that have bolstered their performance levels to new heights, directly responding to the ever-growing complexity of industrial needs.

What is Vitrified Bond Technology?

Before exploring the latest innovations, it's important to understand the fundamentals of vitrified bond technology. Vitrified bonds are ceramic-based materials used to hold abrasive grains together in grinding wheels. They are known for their superior thermal resistance, strength, and ability to maintain precision even under extreme grinding conditions. They are very well known for their fantastic ability to resist heat, the strength they have, and the ability to maintain high-quality precision even when under extreme grinding conditions.

Key properties of vitrified bonds include:

- High stability at elevated temperatures.
- Exceptional rigidity and resistance to deformation.
- Superior chemical and wear resistance.



These properties make vitrified bonds ideal for precision grinding applications, such as automotive components, aerospace parts and medical devices.

Recent innovations that have taken place in vitrified bond technology

Advanced materials

One of the most exciting advancements in vitrified bond technology is the development of new materials designed to enhance the strength and durability of grinding wheels. By incorporating additives like engineered ceramics or nano-particles, manufacturers are able to improve the overall strength of vitrified bonds without sacrificing flexibility.

Benefits of these innovative materials include:

- Extended wheel life.
- Increased resistance to thermal shock.
- Enhanced precision and consistency.

For instance, Kayson Green's partnerships with leading manufacturers like Atlantic and Cafro have introduced innovative vitrified bond products with improved efficiencies for high-precision applications.

Improved bonding techniques

The process of bonding abrasives to wheels has seen significant improvements. Modern techniques now ensure a stronger bond with enhanced reliability, even in challenging industrial environments. These advancements result in reduced chances of bond failure and more consistent grinding results.

Examples of improvements include:

- **Low-temperature sintering techniques:** Reduce energy costs while maintaining bond strength.
- **Optimised curing processes:** Deliver a more uniform bond structure that resists cracking or distortion during use.

Enhanced porosity control

Controlling porosity within vitrified bonds has become a critical focus area for manufacturers looking to improve heat dissipation and chip removal during grinding. Innovations in porosity control allow for better airflow and reduced friction, which directly enhances the overall performance of grinding wheels.

Benefits include:

- Improved cooling, preventing overheating.
- Enhanced debris removal for smoother finishes.
- Longer operational life for grinding wheels.
- Such advancements have transformed grinding processes involving heat-sensitive materials like tungsten carbide or ceramics.

Customisation and tailoring

We have moved past the days of using just a single-size grinding wheel. Grinding has been revolutionised with tailored bonds that are for specific applications and materials. The ability to customise has allowed companies and manufacturers to address their unique challenges directly.

For instance, Kayson Green worked closely with R&D teams at Atlantic over a two-year period to develop a fine-grit silicon carbide grinding wheel for polishing human implants. The result? Dramatically improved surface finishes and enhanced reliability for medical devices.

Another success story includes adapting diamond and CBN grinding wheels for specialised applications, improving productivity and precision for complex industrial needs.

Real-world benefits of innovation in vitrified bonds

The industrial outcomes of these advancements have been nothing short of transformational. Here are real-world examples of how this technology has driven success across industries:

Automotive components: Enhanced grinding precision for crankshafts has improved efficiency while reducing production costs.

Medical devices: Polished human implants are now held to significantly higher standards to ensure that they are of exceptional quality and biocompatibility. This advancement is made

possible by precision-engineered grinding solutions, specifically designed to meet these rigorous requirements.

Aerospace engineering: Enhancing safety and durability are two important factors in aerospace engineering. With custom vitrified bonds, heat-sensitive materials like titanium alloys can be ground much more effectively.

Such results demonstrate how continuous innovation in vitrified bond technology is enabling businesses to achieve both optimised performance and cost savings.

Future trends in the world of Vitrified Bond Technology

Looking forward, Kayson Green anticipates several exciting trends that will shape the future of vitrified bond technology and its applications:

Integration with digital tools: Machine-learning algorithms will soon predict the optimal bond composition for specific grinding tasks.

Sustainability: The development of eco-friendly bonds using recycled or bio-based materials will be a priority for manufacturers.

3D printing: Like many industries worldwide, 3D printing offers the potential to revolutionise the manufacturing of grinding wheels, delivering unmatched precision and customisation.

Kayson Green is at the forefront of these developments, bringing cutting-edge technology to industries worldwide, including its partners, such as Lukas Erzett and Biffignandi.

Drive success with Vitrified Bond Innovation

The evolution of vitrified bond technology reflects the broader industrial demand for precision, efficiency and cost-effectiveness. From advanced materials and improved techniques to tailored solutions, these innovations are unlocking new possibilities for grinding wheel performance.

Get in touch with Kayson Green today if you are looking to better your grinding process, or if you are looking for specific custom solutions and aiming to achieve superior results.

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www.kaysongreen.co.uk

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

Costs per copy: £71.00 with free delivery



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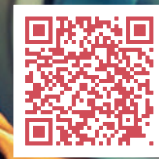
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Key factors in dust control management

by Nicolas Van der Veken, product manager at Donaldson

Dust poses significant health and safety risks in the grinding and surface finishing industry. Effective dust control is essential for maintaining safe working conditions and compliance with dust emissions and combustible dust regulations.

Effective dust control also helps prevent contamination from airborne particles during production. This supports consistent product quality and helps reduce downtime caused by contamination issues. However, industry often relies on filter efficiency for effective dust control, overlooking two other factors that optimise dust control performance: exposure and emissions.

The first step to achieving effective dust control is to assess the average and peak concentrations of airborne contaminants. A facility audit will help identify all dust sources and determine whether existing ventilation hooding is appropriate. This process often reveals new dust generation points and the need for additional controls, such as installing extra hood locations or machine-mountable units.

Once exposure areas are identified, it's important to evaluate the hood size and ducting configuration. Your dust collector can only filter the air that is properly captured, so a well-designed ducting system and correctly positioned hooding will improve unit efficiency and energy consumption. For wet machining, a mixture of oil mist and other contaminants must be filtered, using specific filter units. For dry machining, extendable arms allow flexibility in the working area while maintaining dust extraction efficiency. For wet applications, units can be mounted directly onto the machining equipment.

The next step is to review the appropriate dust collection technology. A good dust collector delivers consistent, predictable performance

that removes contaminants effectively while maintaining a steady air volume at a manageable energy cost. The size and style of a dust collector influences the fan and cleaning energy required for stable operation, so the most efficient system to deliver the necessary air volume must be developed.

When selecting a dust collector, it is also important to analyse the type of filter and its efficiency. Unfortunately, it's not as simple as reviewing filter ratings, as these are tested under lab conditions and don't always reflect real plant needs. In regenerative dust collectors, filters are often pulse-cleaned under heavy loads. They must handle not only new dust entering the collector but also accumulated dust on the filter over time. When a dust collector reaches a stable operating point, the dust concentration on the filter media can be thousands of times greater than the inlet loading. Therefore, evaluating a dust collector in terms of what it achieves at its stable set point and using exposure and emissions testing will give a better indication of the ventilation system's performance.

Contaminants that pass through the dust collector are considered outlet emissions. It is therefore important to know the quality of the filtered air being emitted back into the building or exhausted outside. This requires systematic testing to monitor air quality. An air quality monitoring firm can perform stack testing to measure outlet emissions against air quality goals. Stack testing measures the volume and concentration of material discharged at the outlet of a collector.

Once ventilation needs and emissions limits

are understood, a qualified industrial ventilation designer can produce a suitable dust collection system. They will identify what the dust load demands may produce in terms of energy and cleaning consumption and how to achieve emissions goals in both a cost and energy-efficient way.

Whenever changes are made to a facility or process, it's important to remember that any resulting modifications to the dust collection system can throw it out of balance in terms of air volume. The ventilation designer can advise on system changes, while retesting for exposure and emissions to verify that the remodelled system performs as intended.

Effective dust control not only helps with safe working conditions and compliance, it also supports consistent product quality, helps protect assets and extends the equipment lifespan. Focusing on exposure, emissions and efficiency provides a comprehensive approach to dust management. Proper hooding and ductwork, to capture dust at its source, is an essential element of tackling exposure, while emissions testing confirms the quality of filtered air. Only after these two elements have been addressed should the efficiency of a dust collection system be considered, so that it continues to help protect employees, equipment and the environment.

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Filtermist launches F Save to help machine tool operators cut costs and energy usage



One of the world's leading oil mist extraction specialists has introduced new technology that can help manufacturers improve their environmental performance by cutting energy costs on machine tools by up to 80 percent.

Telford-based Filtermist Limited, which supplies customers across more than sixty different countries worldwide, used its appearance at the EMO Hannover metalworking event to officially launch F Save.

The smart system has been designed to optimise the operation of the company's oil mist collectors, meaning the unit only runs when it is needed rather than constantly being on throughout a full shift, whether the machine tool is being used or not.

F Save includes a sensor which attaches to the coolant pump on the machine tool and communicates with the F Save Hub. If the pump is inactive, the Filtermist unit automatically switches off.

As oil mist is only generated when coolant is in use, this reduces wasted energy while keeping machine operators fully protected from exposure to airborne oil mist particles.

"Our research showed that some machines are only operational for around 20-30 percent of the working day," explains René Joppi, managing director at Filtermist.

"If our unit runs constantly during this time, it wastes resources, increases costs and adds to a company's carbon footprint. With F Save, customers can cut energy usage by up to 80 percent and, in some cases, achieve payback in under three months."

He continues: "Only using the Filtermist unit when it is required has a significant impact, not just on sustainability, but on operating costs too."

Designed for quick installation, F Save does not require any electrical interfacing with the machine tool, making it simple to retrofit to existing units. It also removes the risk of operators forgetting to switch the unit on or off, ensuring workplaces remain clean and safe.

The pre-study of this technology was led by applications engineer Krzysztof Kaszuba. He concludes: "Our research shows that, on average, a machine tool is only cutting parts for about 50 percent of its operating time.

"The rest is taken up by tool changes, part changes, or similar activities. F Save prevents energy from being wasted during these periods, offering thousands of customers worldwide a simple and effective way to cut energy use without compromising safety."

Filtermist, which is part of the Swedish-based Absolent Air Care Group,

provides an extensive range of products and services designed to remove contaminants, such as oil mist, oil smoke, dust and fume from the air in production facilities.

In the UK, the company offers a turnkey service that includes initial consultation and project planning, extraction system design, specification, equipment manufacturer and supply, installation and commissioning, as well as a wide range of aftermarket services such as servicing, maintenance and LEV testing.

F Save is available now through Filtermist and its global network of approved distributors.

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Understanding the role of abrasive technology in modern manufacturing

By Tom Dustman, Director of Sales, Americas at Sunnen Products Company

In the world of precision manufacturing, precision bore honing abrasives do more than polish a surface, they shape the way components perform across their entire lifecycle. From ensuring the seal integrity of aerospace hydraulics to fine tuning combustion chambers in remanufactured automotive engines, abrasive technology quietly plays a critical role in producing parts that are safer, more efficient, and longer lasting. Despite their widespread use, engineered abrasives are frequently misunderstood as simple one-size-fits-all tools that are easily interchangeable. This oversimplification masks the true potential of abrasive technology. To understand the full impact of precision bore honing abrasives, it helps to think of them not as consumables, but as engineered cutting tools with performance characteristics that must match, and even anticipate, the demands of new materials and applications.

Precision beneath the finish

While several finishing methods like grinding and lapping to roller burnishing exist, abrasive honing remains a go-to solution for achieving high precision surface finishes and tight dimensional tolerances. Unlike high-speed grinding, honing is a low speed, high accuracy process that reduces heat distortion, eliminating the "white layer" of stressed metal, and leaving behind a crosshatch pattern ideal for lubricant retention.

The advantages of precision bore honing abrasives are especially clear in critical applications like hydraulics, where a single burr or imperfect bore can lead to leakage or system failure. In automotive remanufacturing applications, the demand for higher power density and lower emissions has driven tighter tolerances amongst more complex surface requirements. Bore finishes that once required only a single roughness parameter now must meet up to five separate metrics. These tighter specifications place higher demands not only on machine tools, but on the engineered abrasives themselves.



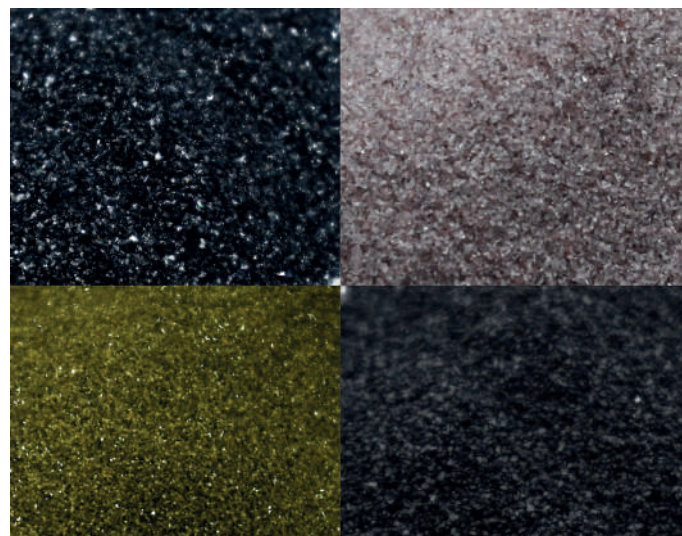
A honing tool applies engineered abrasives to create the distinctive crosshatch pattern that improves oil retention and reduces stress in internal combustion engine bores.

Image Credit: Sunnen Products Company

The rise of superabrasives

One of the most transformative advancements in the past 50 years has been the emergence of "superabrasives," specifically those composed of industrial diamond and cubic boron nitride (CBN). These materials are tougher than traditional silicon carbide or aluminum oxide and offer approximately 100 times the tool life of conventional precision bore honing abrasives. When bonded in a metal matrix, they retain cutting performance much longer, minimising tool changes and reducing downtime in automated production lines.

Precision bore honing superabrasives have also unlocked the ability to finish increasingly tough materials, like Inconel in energy sector components or Compacted Graphite Iron (CGI) in remanufactured engine blocks, that would quickly degrade conventional engineered abrasives. In these cases, material hardness isn't the only challenge. Different materials demand engineered abrasives tailored not just by hardness, but also by grit concentration, bond type and geometry. This complexity has given rise to a new class of precision bore honing abrasives that are no longer off-the-shelf tools, but tightly engineered products tailored to specific applications.



Side-by-side view of traditional and superabrasive materials, including aluminum oxide, silicon carbide, cubic boron nitride (CBN), and industrial diamond—each tailored for different material hardness and applications. Clockwise from top right: Brown Aluminum Oxide, Cubic Boron Nitride (CBN), Diamond Abrasive, and Black Silicon Carbide.

Image Credit: Sunnen Products Company

Many commodity abrasive suppliers focus on minimising cost, often sourcing low grade abrasive particles with weak crystal structures. These materials may meet basic specifications on paper, such as grit size or shape, but under the microscope, their internal structure tells a different story. Microfractures and inconsistencies lead to premature breakdown, unpredictable wear and erratic performance.

By contrast, engineered abrasives consider a broad spectrum of variables:

- **Particle type and hardness:** For example, on the Knoop hardness scale, industrial diamond ranks around 7400, CBN around 4700, silicon carbide at 2600, and aluminum oxide at 2100.
- **Crystal structure and coating:** Tin or copper coatings can enhance bonding and wear resistance.
- **Bonding materials:** Glass, ceramic, and metal matrices affect how the abrasive responds under pressure and heat.
- **Grit concentration and shape:** Tighter packing densities and varied geometries influence chip load and consistency.

Choosing the right combination of these factors determines not just whether a part can be honed, but how efficiently, how precisely and how repeatedly it can be done.

New materials, new challenges

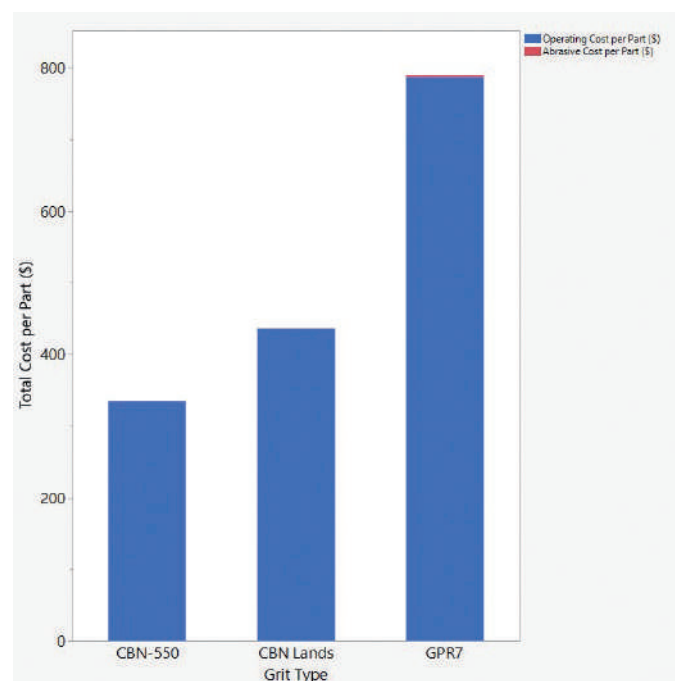
As industries shift toward lighter, harder and more wear resistant materials, especially in aerospace, energy and EV applications, abrasive technology must keep pace. Hydraulics manufacturers, for instance, are under increasing pressure to meet “zero leak” mandates. This level of precision requires not only a matched piston-to-bore fit but also burr free cross holes that can only be achieved through optimised honing.

The need for longevity and performance consistency also feeds into broader sustainability goals. Longer lasting engineered abrasives mean fewer changeovers, less scrap and more uptime; crucial in continuous manufacturing environments. Manmade materials like “seeded gel” aluminum oxide, engineered from scratch rather than mined, have added another layer of control. These synthetics feature uniform crystal structures and custom engineered bonds, offering improved wear resistance and surface consistency in a growing range of applications.

With more than a century of experience in bore sizing and surface finishing, Sunnen has contributed to the evolution of abrasive technology by integrating materials science with process engineering. Rather than viewing engineered abrasives as off-the-shelf consumables, the company

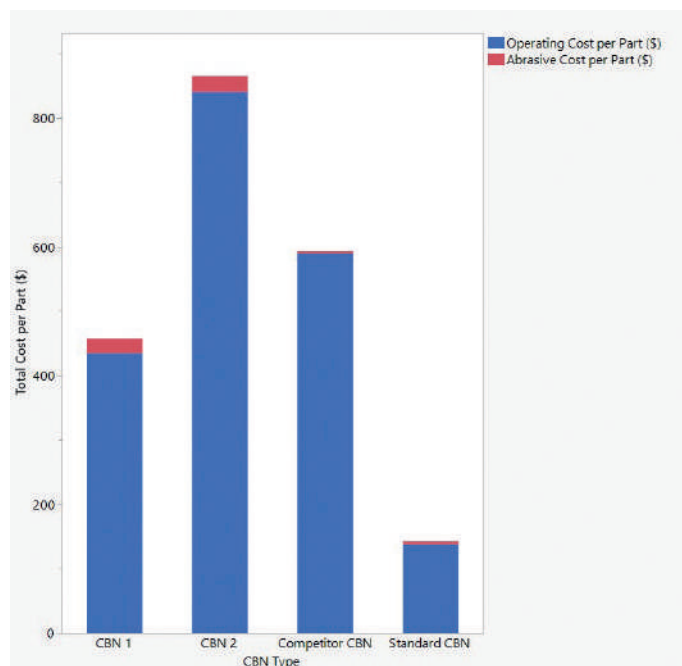
approaches them as precision tools that must be matched to specific performance requirements. Over time, Sunnen brought abrasive manufacturing in-house, allowing for greater control over quality and consistency. Rather than relying on patents, the company has developed proprietary processes that guide how it selects particle types, bonding methods, and abrasive geometries. This internal expertise supports both standard catalogue offerings and highly customised solutions, depending on the application.

One distinguishing factor is how Sunnen’s precision bore honing abrasives are developed alongside its honing machines and control systems. This co-design approach helps ensure that the abrasive performs reliably within the larger system, particularly in applications where precision is non-negotiable, such as engine cylinder bores or aerospace hydraulic valves. In practice, this alignment can support more stable tool life, reduced downtime and more consistent results across production batches.



CBN-550 is the standard Sunnen CBN. The other two shown are alternative CBN grades.

Image Credit: Sunnen Products Company



Standard CBN is the normal CBN that Sunnen sells. The other three are alternative CBN grades that were compared for performance.

Image Credit: Sunnen Products Company

Where abrasive technology is headed next

Looking ahead, advancements in synthetic precision bore honing abrasives, coatings and bonding systems are expected to continue reshaping the industry. Precision will only grow in importance as sectors like EVs, aerospace and renewable energy demand tighter tolerances and tougher materials. Simultaneously, the rise of automation and data driven manufacturing will place a premium on predictable tool life and repeatable performance, attributes that only high quality, engineered abrasives can deliver. As manufacturers reevaluate their processes through the lens of productivity, sustainability and material science, engineered abrasives are no longer just the end of the line. Precision bore honing abrasives have become vital contributors to solutions, performing as cutting tools themselves and subtly shaping the future of precision manufacturing.

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Understanding CNC honing: Six factors that influence your results

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CNC honing is a critical final step in the production of high-precision components, particularly those with tight tolerances and specific surface finish requirements. But achieving consistently accurate results depends on more than just running a standard cycle. Before exploring the factors that influence honing accuracy, it's important to understand the core stages of the CNC honing process and how they interact to produce a precision-finished bore:

CNC honing process steps

Preparation: Confirm OD, ID and length to ensure the component fits the machine safely. Mount a correctly sized honing tool, insert the relevant stones and then clamp the part in a rigid, repeatable fixture.

Programming: Enter material, initial/final bore size and surface-finish requirements into the CNC programme. Set the spindle speed, stroke length and feed rate in the program.

Honing: Start the cycle, the honing tool rotates and reciprocates and the abrasive stones expand against the bore wall. Material is gradually removed to achieve the required size and finish specifications.

Inspection: Both in-cycle and upon completion, monitor and measure the part's diameter, roundness and finish on the machine. Some CNC machinery has in-process gauging, others require a more manual approach. If the desired condition has not been achieved, adjust size, stone expansion or feed rate.

Production: Once the programme is proven, the cycle is dialled in and the CNC repeats the

process for every part, yielding uniform, high quality, high precision components. CNC honing demands highly rigid machinery, as even minor spindle or fixture deflection can result in out-of-round bores or unwanted taper. Studies consistently show that machine and fixturing stiffness are key contributors to achieving accurate cylindricity. At Hone-All, its high-precision CNC honing machines can maintain bore tolerances within ± 0.005 mm. Experience, expertise, regular calibration and preventative maintenance ensure this level of accuracy is both consistent and repeatable.

2. Tool selection

The honing tool and abrasive must be carefully matched to the material and bore geometry. Aluminium oxide stones are typically used for steels, while silicon carbide or diamond abrasives are preferred for cast irons and harder superalloys. Stone length and taper must correspond precisely to the bore dimensions, as any mismatch can compromise accuracy. Using custom-balanced tooling further enhances precision, while high-quality mandrels help to minimise vibration.

3. Material type

The properties of the components material have a direct impact on the honing process. Harder alloys require premium abrasives and lighter cutting pressures to avoid excessive tool wear or thermal distortion, while softer metals can tolerate more aggressive feeds. Thermal conductivity also varies by material, influencing the choice of honing oil. Each alloy demands specific speeds, feeds and lubrication to achieve the desired surface finish and dimensional accuracy.

4. Honing parameters

Spindle speed, stroke length, feed rate and abrasive pressure must all be precisely calibrated to optimise the honing process. Among these, stroke and pressure have the greatest influence on bore roundness, which is why operators typically favour moderate speeds and lighter cuts to maintain control and minimise distortion. Once the ideal parameters are established, CNC automation ensures they are applied consistently across every part.

5. Workholding and fixturing

A rigid, precisely aligned fixture is essential, as even slight part movement during honing can compromise bore geometry. Balanced clamping methods, such as spring collets, help to prevent distortion, both during machining and upon release. At Hone-All Precision, fixture alignment is carefully verified for every setup to ensure the bore remains perfectly concentric under load and throughout the entire honing cycle.

6. Lubrication

Effective lubrication is critical to the CNC honing process. High-performance honing oils not only dissipate heat but also flush abrasive particles from the cutting zone, preventing glazing and surface damage. Proper lubrication reduces friction, stabilises cutting forces and significantly extends the life of the abrasive stones for more consistent and accurate results.

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Aligning the skies

In the demanding world of aerospace, where precision and performance are paramount, even the smallest deviations can have significant consequences. Maintaining the intricate internal components of aircraft has long presented a challenge, often requiring extensive and costly disassembly.

However, UK-based honing expert delapena says it has introduced a paradigm shift with its innovative Tandem Alignment Honing Tools, redefining the landscape of aerospace repair.

For decades, delapena has been a cornerstone of the honing market, providing comprehensive solutions for a diverse range of industrial needs, both domestically and internationally. The company's expertise spans the entire spectrum, from the design and manufacture of standard and bespoke honing machines and abrasives to a comprehensive suite of support services. This includes feasibility studies, precise specification, new machine development, specialised tooling and invaluable consultancy, tooling refurbishment, application development, process engineering, honing reviews and tailored training packages.

With a decade of continuous innovation under its belt, delapena has consistently pushed the

boundaries of honing technology. Looking ahead, the integration of Industry 4.0 principles will see the development of intelligent, automated loading machines designed for optimal productivity.

The aerospace sector's relentless pursuit of lighter, higher-performing components, demanding greater power densities, tighter control, enhanced sealing and reduced noise and vibration, places immense pressure on manufacturing and maintenance processes. Honing, renowned for its ability to achieve exceptionally tight bore diameter tolerances, plays a crucial role. Beyond mere sizing, honing perfects the roundness, straightness and overall surface finish of critical bores.

Traditionally, the maintenance of intricate and often inaccessible aircraft components has been a cumbersome affair. Removing landing gear elements, engine cylinders and other vital parts was commonplace, leading to significant operational disruptions and substantial maintenance expenditures. Enter delapena's Tandem Alignment Honing Tools, a development the company confidently labels a 'gamechanger' in aerospace repair.

This effective tooling has revolutionised the



maintenance of twin bores in aircraft. By directly addressing the challenge of honing these crucial bores, essential for proper alignment and peak performance, delapena's innovation eliminates the need to dismantle surrounding structures, drastically reducing costly and time-consuming disassembly.

These seemingly simple yet highly effective tools enable the in-situ remachining of major structural elements. This ensures perfect alignment and significantly extends the lifespan of critical components, contributing to safer, more efficient and ultimately more sustainable aerospace operations. The elimination of expensive dismantling and reassembly further amplifies the benefits.

delapena Honing Equipment Ltd

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New M.M.9400 Lam Plan lapping machine

Lapping & polishing machine for variable production of small parts

For this new version of its best-selling M.M.8400, Lam Plan has tried to retain the essence of this table-top trimmer/polisher by making a number of fundamental improvements.

The M.M.9400 is a solution for integrating a means of finishing flat surfaces into your workshop at a contained price. The machine's compact dimensions and ergonomic controls are still there, but it has become more rigid and even more versatile.

It can be fitted with a wide range of accessories to adapt your equipment to your needs. Integrated control of Lam Plan feeders, recipe memory and motorised drive are just some of the possibilities.

Versatility

The M.M.9400 can be fitted with cast iron, DIALAM®, NEW LAM® M'M' or FAS® platens, enabling you to achieve all types of surface finish defined in your specifications, e.g. honing, thickness adjustment, honing, polishing, etc. It is also perfectly suited to your maintenance needs on all sealing parts, e.g. lapping of flaps, safety valves or small mechanical seals.

New configuration and improvements

- More rigid welded tubular steel chassis, stainless steel tank.
- Ergonomically improved controls, better visibility of screen in working position.



- 4.3" touch screen.
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Since 1962 Lam Plan has imposed itself as a real specialist in all the polishing technologies. It has provided customers with its scientific competences and its technical know-how to accompany them in an ever-finer control of their lapping and polishing problematics.

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Lam Plan directs all of its efforts and research toward the development and manufacture of products anticipating the evolution in health and safety rules for both the respect of user health and the preservation of the environment.

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The Science behind

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Complete grinding, lapping & polishing systems



Engis Corporation is a third-generation privately-owned US-based manufacturer of high-performance superabrasive lapping, grinding, honing and polishing products and related machinery and accessories.

The company began in 1938, with offices in the US and UK, as a trading company for

precision measuring equipment and industrial machinery. The company entered the abrasives market in the 1940s with the development of its Hyprez Diamond Compounds for precise polishing of critical components for defence and aviation industries. Since that time, Engis expanded its range of superabrasive products, applications and industries served to be recognised as a leader in superabrasive finishing systems.

The company's 131,000 sq foot headquarters and manufacturing facility in Wheeling, Illinois, is located 15 miles north of Chicago's O'Hare International Airport. To provide sales, technical and logistical support for multinational and foreign customers, Engis has established subsidiary companies located in Canada, the UK, Japan, Korea, Singapore, Hong Kong and China, supplemented by a worldwide network of agents and distributors.

Engis products are developed, customised and supported by teams of experienced

research scientists, design and application engineers.

Process development

Engis process development labs provide proven results for challenging and difficult applications in addition to providing customer training. Combined with its consumable products and machinery tailored to meet your requirements, the Engis systems approach provides assurance of cost effective and consistently repeatable performance.

It takes pride in its employees, in their skills and accomplishments. Engis strives to provide a safe workplace where people can have a sense of purpose and pride in what they do. The company has been fortunate to attract and retain talented employees who have spent almost their entire careers at Engis. Engis is also committed to develop and train a new generation of employees.

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Polishing watch hands using colloidal silica

This study outlines the successful optimisation of a mirror polishing process for watch hands using colloidal silica. The primary challenge addressed was minimising surface round-off while using three different fixtures on a KemCol 15" polishing machine. The process incorporated Chem-H cloth, a Dycem-backed pressure weight and Col-K (NC) slurry, with detailed experimentation on cycle times to determine the most effective polishing duration.

Polishing watch hands to a mirror finish requires high precision, especially when transitioning from a fine abrasive finish to a final polish. The objective of this study was to determine an optimal polishing cycle that effectively removes micro-scratches from a prior diamond polishing step while minimising geometric distortion, particularly round-off, often introduced during final finishing.

Process breakdown

Each of the three fixtures containing watch hands was placed concentrically within a 15" ceramic control ring. A Dycem-backed pressure weight was applied atop each fixture, providing consistent pressure and ensuring uniform contact with the polishing cloth. This setup served the dual function of loading and fixturing the parts during the process. Polishing was conducted using Col-K (NC), a non-crystallising colloidal silica suspension. To identify the optimal polishing cycle, the process was repeated across three-time intervals with decremental durations. Between each test cycle, fixtures were rinsed with DI water, dried using compressed air and inspected under a microscope for finish quality and geometry retention.

Results and analysis

Surface finish: All test samples showed complete removal of prior scratches from the 0.5 μ m diamond polishing step. Col-K (NC) proved effective in achieving a smooth, mirror-like surface finish across all tested durations.

Round-off and dimensional retention:

1 minute 30 seconds: Good finish, but observable round-off on edges of the watch hands, indicating over-polishing.

1 minute: Reduced round-off compared to 1:30, but slight edge degradation still present.

30 seconds: Excellent surface finish with minimal to no perceptible round-off, offering the best balance of finish and dimensional preservation.

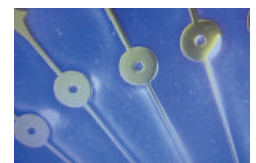
This study demonstrated that Col-K (NC) is a highly effective slurry for final mirror polishing of watch hands, particularly when used with Chem-H cloth and a Dycem-backed pressure weight for controlled loading. A 30-second polishing cycle yielded the most desirable results, removing all surface scratches from the previous 0.5 μ m polishing step while preserving the geometric integrity of the parts.

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Before processing.



After processing.

Q-Fin provides the competitive edge

T & C Precision Ltd is a leading supplier of sheet metal fabrication solutions. Founded in 1989 by Trevor Lee and Carl Fowlie, for a number of years it provided sweet racks for garages, cinemas and supermarkets, as well as architectural louvres, flashes etc.

The company moved from Emsworth to its current premises in Southborne, Hants, and is headed up by Trevor and his son Morgan. It holds ISO accreditation, JOSCAR certification and is a BAE and Bombardier registered supplier.

The expert team, headed up by Morgan, can hand finish components using an array of abrasive methods, including PDJ vibratory finishing machines for the automated finishing of smaller components.

Plant includes the latest Amada AE 2510 NT thick turret press, which utilises a servo electric ram to help reduce power consumption and cost-per-part, as well as improved control over the ram for faster and more efficient punching.

The company now specialises in manufacturing small parts for the aerospace industry, including BAE Systems and Bombardier. They also work for Dordeu making circuit board shields and shims for switches using 0.2 mm up to 20 mm mild steel.

A couple of years ago, and prompted by



The Q-Fin TopGrinder.

Steve Warden, the area sales manager for Simpson Technology, the company purchased a Q-Fin TopGrinder for deburring and radiussing.

The Q-Fin TopGrinder

The TopGrinder is an ergonomic, robust, and exceptionally safe mobile finishing machine. With its two-button control and CE marking, you can always work safely and with full control. The brush speed is infinitely adjustable, and the machine is equipped with vacuum or magnetic fixation to securely hold the workpiece in place.

The balance arm allows you to easily adjust the grinding pressure through the spring package, ensuring the right amount of force is applied every time. The dual grinding head has two tool mounts, allowing you to quickly switch between different tools. You can mount a variety of grinding tools, from standard M14 attachments to Q-Fin's Quick Release combination brushes for specific applications.

Even wider products are no problem: the front and side edges of the table can be easily folded. Additionally, working on multiple products at once is possible, which increases efficiency.

The TopGrinder is the best hand-operated finishing machine in the world, offering the perfect balance of speed, safety, and ease of use.

When a new customer meant increasing production from 100 parts per month to up to 20,000, Morgan Lee looked for a machine to fulfil this demand, and he turned once again to Q-Fin for the solution:

"I wanted to find a machine that did the same job as the TopGrinder but with more automation."

He found the answer in the Q-Fin F250. This impressive little machine was the winner of the prestigious 2024 Euroblech Award, and was specifically developed for small sheet metal parts.

The Q-Fin F250 Small Parts Finish Machine

The advanced F250 finish machine is equipped with an intuitive HMI touchscreen for effortless operation. This screen enables operators to easily switch between various finish programs, ensuring high reproducibility of product quality and minimising operational errors. Depending on the materials to be finished, you can choose a system with vacuum or magnetic support.



Morgan Lee (left) and Trevor Lee (right).



The brushes provide an even rounding of all edges and holes, on both inner and outer contours, leading to the most optimal finish.

The F250 offers options for automatic brush calibration that ensure constant consistency and precision, as well as full ERP control and flawless integration into automated production environments. In short, it is a finish machine that is fully prepared for the future.

Morgan Lee continues: "The F250 has two deburring heads and a finishing unit. Basically, you can put a part in one end, finish the main burr off, and the two counter rotating heads radius all the edges. It's perfect. In the future, we will be looking to invest further in the Q-Fin range. If volume continues to increase, we'll outgrow the current machine in a year. Our problem is that we can't churn out parts quick enough!"

Q-Fin b.v. was founded in 2013 in Bergeijk, Netherlands, and continues to lead the market in developing, building and supplying solutions for deburring, rounding and finishing sheet metal parts. It emphasises the importance of innovation and automation, incorporating advanced technology like touch screens and smart software into its machines to enhance performance and user-friendliness.

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This small powerhouse can process all products from the size of a Euro coin up to 250 mm wide. At the input side, burrs and imperfections are removed by a grinding unit, resulting in a smooth and burr-free surface. This is followed by two oscillating disc brushes that apply light pressure.

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Keep the wheels turning



One Midlands business leader is calling for a collective show of confidence from British manufacturers. Chris Arrowsmith, managing director of Midland Deburr & Finish Ltd, based in Lye, Stourbridge, says that while headlines highlight a slowdown, what he sees daily on the factory floor tells a very different story.

"The phones are still ringing. The work is still coming in. From tiny precision parts to engine-sized castings, there's an incredible diversity of manufacturing going on across the UK," Chris Arrowsmith states. "Now is not the time to retreat. Now is the time to double down on quality, consistency and delivery because that's how we keep the wheels of industry turning."

The S&P Global UK Manufacturing PMI slipped to a five-month low of 46.2 in September, indicating contraction for the twelfth consecutive month. New orders and output fell, export confidence weakened and job cuts continued across much of the sector. But for firms like Midland Deburr & Finish, which specialises in vibratory deburring, vibro-polishing and solvent-based metal degreasing, demand for precision and reliability is stronger than ever.

"Customers are under more pressure than ever to deliver flawless components," Chris Arrowsmith explains. "We're seeing everything from aerospace rings and precision pressings to huge castings coming through our doors. The common factor is the need for absolute consistency, whether that's through vibratory deburring to achieve the perfect surface finish, or vapour degreasing to ensure every trace of oil and contamination is removed."

From its ISO 9001 and ISO 14001 accredited facility, Midland Deburr & Finish handles components from 2 mm to 1.5 m, serving customers across the automotive, aerospace, energy and general engineering supply chains. The company offers next-day turnaround, free local delivery and batch flexibility ranging from one-off prototypes to thousands of parts.

While some may view deburring and cleaning as a cosmetic step, Chris Arrowsmith insists it's central to performance and safety. "There's a misconception that deburring is just about appearance," he says. "In reality, it's about reliability and safety. Burrs create stress points that can lead to fatigue or premature wear when parts interact. Likewise, poor cleaning can compromise coating adhesion or allow contaminants into assemblies. That's why more and more manufacturers are turning to us."

Midland Deburr's vapour degreasing process leaves no watermarks, stains, or discolouration. This is a key requirement before plating, painting, or assembly. Combined with vibratory finishing, it ensures components not only look the part but perform to world-class standards.

"When you are part of the supply chain for aerospace or advanced engineering, the margin for error is zero," Chris Arrowsmith adds. "That's where UK manufacturing excels: precision, pride and process control." The latest PMI report may reflect a challenging macroeconomic backdrop with weaker orders, energy costs and uncertainty around government policy all weighing on sentiment but Chris Arrowsmith believes the data doesn't tell the whole story.

"It's easy to look at the numbers and get disheartened," he notes. "But manufacturing isn't built on sentiment; it's built on skill, service and graft. The truth is, while others are hesitating, the most resilient firms are getting out there, visiting customers, investing in process and showing what British industry can do."

"We need to be bullish, not bashful," he continues. "We've come through Brexit, a pandemic, supply chain chaos, and rising costs and we're still here, still producing. That tells you everything you need to know about British manufacturing."

Inside Midland Deburr's busy workshop, that message of determination is alive and well. One day might see thousands of small, machined components processed for the automotive sector; the next, a single large aerospace casting requiring precision vapour degreasing.

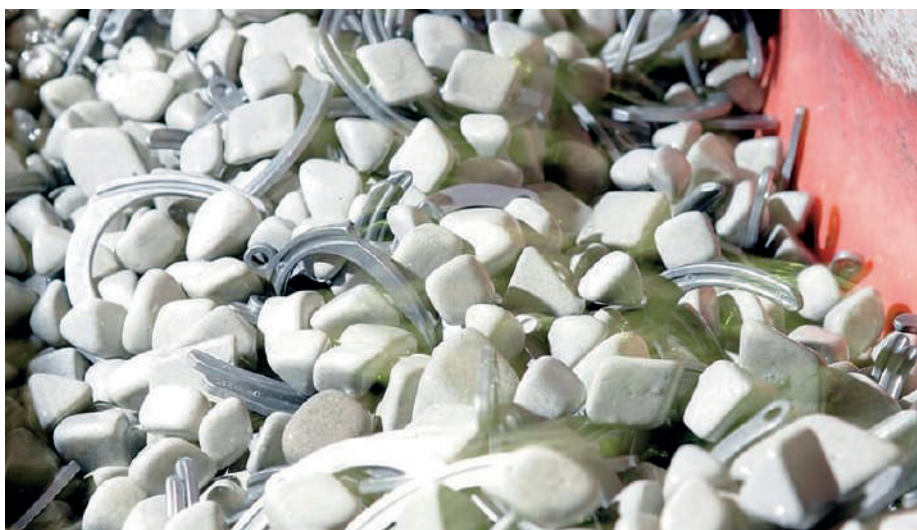
"That variety keeps us sharp and proud of what we do," Chris Arrowsmith explains. "It's a privilege to play even a small part in helping customers deliver world-class products. Whatever the headlines say, there's still incredible capability, creativity and commitment in UK manufacturing and we're determined to keep that momentum going."

As UK manufacturers navigate economic headwinds and await clearer signals from policymakers, Midland Deburr & Finish's message is simple: keep moving, keep making and keep believing.

"The time for retreat is over," Chris Arrowsmith asserts. "We've got the skills, the equipment and the determination. Let's use them, together, to drive the next phase of British manufacturing forward."

Vibratory deburring precision at the heart of manufacturing

Lye-based finishing specialist Midland Deburr & Finish Ltd is helping world-class manufacturers achieve the flawless components their industries demand, thanks to its expertise in deburring, solvent degreasing, vapour degreasing and casting impregnation. Founded in the Black Country, Midland Deburr & Finish has grown into a trusted partner for companies across automotive, aerospace and even Formula One supply chains. Its role, though often invisible to the end customer, is vital: ensuring every component meets stringent standards for safety, reliability and performance.



"Good metal finishing is about making the finished part perform flawlessly," explains Managing Director Chris Arrowsmith. "Burs, residues or imperfections might seem small, but in critical applications like aerospace or Formula One, they can cause failure. Our job is to make sure our customers never have to worry about that."

The company offers a comprehensive portfolio of services, from vibro and barrel mass finishing for burr removal and polishing, to

state-of-the-art solvent degreasing in hermetically sealed machines that ensure both precision and environmental compliance. Ultrasonic processing allows even the most complex and delicate components to be cleaned thoroughly, reaching areas traditional methods cannot.

Midland Deburr & Finish's commitment to sustainability has also set it apart. The firm phased out the use of trichloroethylene in 2020, replacing it with perchloroethylene to meet

strict legislation, and continues to invest in eco-friendly technologies.

"Quality and environmental responsibility go hand in hand," explains Chris Arrowsmith. "Customers expect exceptional results, but they also want partners who are thinking about the future. We're proud that our processes not only meet ISO 9001 and ISO 14001 standards but also help reduce waste and minimise our carbon footprint."

The company's dedication to precision finishing extends beyond just deburring and cleaning. Services such as radiussing, scale and rust removal, polishing and pre-plate or pre-paint finishes ensure components are fully prepared for downstream processes.

Chris Arrowsmith concludes: "We see ourselves as a one-stop shop for surface improvement. Whether it's a small subcontract job or a large aerospace project, we bring the same level of care, expertise and personal service. That's why customers keep coming back."

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Deburring machines from ARKU



With ARKU deburring machines you can process the edges of your metal parts, sheets and plates efficiently, removing rough burrs or sharp edges left on metal parts after manufacturing process like cutting for example. Automated deburring machines.

Whether thin sheet metal, heavy plate, small or large burrs, ARKU can find the perfect deburring machine for your sheet metal and heavy plate processing requirements whether you are cutting with laser, flame, plasma, oxyfuel or for punched parts. Are you looking for a solution that offers you optimal sheet metal quality, high process reliability and low unit costs? ARKU can offer the optimal deburring machine for you.

Deburring of laser cut and punched parts

Deburr and edge round your laser cut and punched sheet metal with the Edgebreaker®. Various models suit different deburring processes and can handle a broad range of materials and dimensions.

EdgeBreaker 6000

The EdgeBreaker® 6000 is just as flexible as the laser cutting machine itself when it comes to subsequent deburring, edge rounding and, if

required, surface finishing. The deburring machine completely processes your punched and laser cut parts in a single pass. First, the grinding belt removes the burrs remaining after cutting. The unique rotary brushes then ensures extremely uniform edge rounding, even a radius of up to 2.0 mm for sheet metal. Both large and small sheet metal parts can securely be processed thanks to a built-in vacuum table. Thanks to a grinding belt, rotary brushes and surface finishing unit, the EdgeBreaker 6000 is the most universal deburring machine in the EdgeBreaker family.

It enables the processing of the widest possible range of sheet metal and sheet metal parts. Whether small sheet metal parts or large metal sheets, this deburring machine provides consistent high-quality results for deburring, edge rounding and surface finishing. The EdgeBreaker 6000 is particularly suitable for laser-job shops with constantly changing processing requirements.

The most striking unit in the EdgeBreaker 6000 makes it possible: the rotary brushes. These rotary brushes achieve a unique edge rounding along the sheet metal edges. As the brushes hit the sheet metal in various directions, you can achieve a very uniform result

on the inner and outer contours. If necessary, an edge rounding radius of up to 2 mm is possible.

All processing units, deburring, edge rounding and surface finishing, are equipped with a quick-change system for the tools to minimise setup times. You can simply remove the belts and rotary brushes, without any tools needed. The machine can be outfitted with a variety of different tools, various grits and material composites are available. All for optimum deburring, edge rounding and surface finishing results to suit your changing requirements.

The graphical touchscreen HMI is very intuitive and easy to operate. It supports you in setting up the machine and provides tips on operation and maintenance. It can even be used while wearing safety gloves. It offers efficient processing without errors.

Deburring of plasma & Oxyfuel cut parts

ARKU deburring machines for flame cut parts are unique on the market and famous for their robust design. Oxyfuel cut or plasma cut parts with slag or burrs of more than three mms thickness are no problem for Edgebreakers. Users can benefit from extreme performance and longevity.

EdgeBreaker 9000 Line

More throughput, less effort, reproducible quality. Sounds too good to be true? Thanks to the double-sided processing of the EdgeBreaker® 9000 LINE, this is possible. The EdgeBreaker® 9000 LINE takes over the complete processing of your flame cut parts after plasma and oxyfuel cutting in just a single pass. It can remove slag, deburr and round edges. Changing parts between machines is a thing of the past. Processing your flame cut parts will be easier, faster and more reliable than ever before.

The EdgeBreaker 4000 processes flame, plasma and oxyfuel cut metal parts or plates on both sides in just a single pass. You will save up to 50 percent of time compared to working with single-sided machines.

If you produce the same metal plate or part from time to time, you can save the processing settings directly in the machine and call upon the values when required. This allows you to quickly setup the deburring machine for repeat production runs. Thus, avoiding errors during setup.

For consistent results, it is essential to always know where you stand. The EdgeBreaker 4000 measures the remaining length of your edge rounding tools, abrasives, within the machine and automatically compensates for the wear off. Leaving you with consistent results from beginning till end of the tools life.

The graphical touchscreen HMI is very intuitive and easy to operate. It supports you in setting up the machine and provides tips on operation and maintenance. It can even be used while wearing gloves. For efficient processing without errors.

Various other processes, such as blasting systems, parts levellers and robotics, can be easily linked to the system via ARKU Connect. This Industry 4.0 preparation makes the EdgeBreaker 9000 LINE particularly future-proof and expandable.



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Essential guide to deburring and cleaning laser-cut parts for enhanced quality

Laser cutting technology has revolutionised the manufacturing industry, offering precision and speed. However, laser-cut parts often require post-processing steps like deburring and cleaning to achieve the highest quality and functionality. In this article, Jonsen explores the best methods and techniques for deburring and cleaning laser-cut parts, ensuring they are safe, smooth and ready for final use.

Why deburring laser-cut parts is crucial for product quality

Deburring is a necessary step after laser cutting, as the cutting process can leave behind sharp edges, burrs and slag. These imperfections can impact part performance, safety and the quality of further manufacturing processes like welding or assembly. Here's why deburring is essential for maintaining optimal part quality:

Improved safety: Sharp edges on laser-cut parts can lead to accidents during handling or assembly. Proper deburring helps minimise the risk.

Enhanced performance: Burrs can create stress points on parts, leading to premature wear and failure. A smooth finish improves overall functionality.

Corrosion prevention: Laser cutting often results in oxide layers or slag on the surface. Deburring helps remove these contaminants, preventing rust and corrosion.

Top deburring methods for laser-cut parts: Which one is right for you?

When it comes to deburring laser-cut parts,

manufacturers have several methods to choose from, each suited to different materials, part sizes and production volumes. Here are the most common techniques used for deburring laser-cut metals:

Manual deburring

Manual deburring involves using hand tools like files, brushes, and abrasive pads to remove burrs and sharp edges. While this method is economical for small batches or highly detailed work, it is labour-intensive and may not be suitable for large-scale production. Manual deburring works best for parts that require precision and a delicate touch.

Mechanical deburring

Mechanical deburring uses automated equipment, such as vibratory finishing machines or belt sanders, to remove burrs and imperfections more efficiently. This method is ideal for higher volumes of parts and delivers consistent results. It's often used for larger or simpler parts that do not require the fine detail of manual deburring.

Laser deburring

Laser deburring is an advanced, high-precision method that uses a second laser to target and vaporise the burrs left on a part's edge. This technique is incredibly effective for thin metals or delicate parts and offers the benefit of reducing manual labour and minimising the risk of damaging the part. Laser deburring also works well in automated settings, allowing for a seamless integration into production lines.

Brush deburring

Brush deburring uses rotating brushes to gently

remove burrs and sharp edges without damaging the part's surface. This method is especially effective for materials like stainless steel and aluminum, which can be more susceptible to scratching or scuffing with harsher deburring techniques.

Abrasive blasting

Abrasive blasting, commonly known as sandblasting, is a technique that uses abrasive materials like sand or glass beads to remove burrs and slag from laser-cut parts. It also cleans the part's surface, leaving it smooth and ready for coating or further processing. This method is well-suited for parts with complex geometries, and it works efficiently on materials like steel and aluminum.

Effective cleaning methods for laser-cut parts

After deburring, cleaning laser-cut parts is the next critical step in ensuring quality. Laser cutting often results in oxidation or slag formation, especially with metals like steel. Proper cleaning not only improves the appearance of the part but also prepares it for further processing, such as painting or welding.

Here are some of the most effective cleaning methods:

Ultrasonic cleaning

Ultrasonic cleaning uses high-frequency sound waves in a cleaning solution to dislodge contaminants like oil, grease, and dirt from the part's surface. This method is perfect for cleaning small or intricate parts, especially those with complex geometries that are difficult to clean using traditional methods. The



ultrasonic waves ensure a thorough cleaning without damaging the part.

Chemical cleaning

For laser-cut steel or aluminum parts, chemical cleaning is an effective way to remove oxidation, slag, and any other residues formed during the cutting process. By using acidic or alkaline solutions, manufacturers can break down contaminants and ensure a clean surface. However, it's essential to select the appropriate chemicals to avoid damaging the material.

High-pressure water cleaning

High-pressure water cleaning is a fast and effective method for removing dust, debris, and residual slag from laser-cut parts. It's especially useful when you need to clean larger parts or when you want to avoid using chemicals. The high-pressure stream of water ensures that the part is thoroughly cleaned without the risk of abrasion.

Dry cleaning

Dry cleaning involves using methods like compressed air or dry abrasive media to remove contaminants from the part's surface. This is particularly useful for parts that are

sensitive to moisture or that require minimal exposure to liquids. Dry cleaning is commonly used for small parts or where a quick turnaround is necessary.

Key considerations for post-deburring and cleaning

Once deburring and cleaning are completed, it's essential to inspect the parts for quality. Common post-processing checks include:

Visual inspection: Ensures that burrs and other imperfections have been removed and that the part is ready for use.

Edge radii measurements: Verifies that edges have been smoothed to the required specifications.

Surface finish inspection: Checks for any scratches, oxidation, or residues that may affect the part's performance or aesthetic.

The importance of proper deburring and cleaning for laser-cut parts

Effective deburring and cleaning are essential steps in the laser cutting process that directly impact the quality, performance and safety of

the final parts. By selecting the right combination of techniques, whether manual, mechanical, or advanced laser-based methods, manufacturers can ensure a consistent, high-quality finish. Moreover, choosing the most suitable cleaning methods helps remove contaminants and prepares the part for subsequent treatments, ensuring durability and performance.

JONSEN, established in 1993, has built a distinguished 26-year history specialising in metal surface treatment technology. As a pioneer in the industry, JONSEN holds the honour of being the inaugural establishment unit of China's metal sanding machine industry standard and has played an instrumental role in formulating over 20 industry standards. With extensive experience in deburring and cleaning laser-cut parts, JONSEN manufactures specialised equipment designed for efficient post-processing, ensuring smooth, burr-free, and clean parts.

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New VGrind infinity linear masters infinite grinding tasks

"One for all" is the motto according to which sharpening specialist VOLLMER has developed and launched its new VGrind infinity linear tool grinding machine. The machine is the new all-rounder for the flexible production of rotary tools. It can precisely, quickly and energy-efficiently machine precision tools with diameters from 0.2 to 200 mm made of different cutting materials such as carbide, high-speed steel, PcBN or ceramic. Automation and digital solutions from the VGrind infinity linear enable unmanned operation around the clock, from small batch sizes and special solutions to series production.

The VGrind infinity linear grinding machine from VOLLMER automatically machines various cutting materials such as carbide, High-Speed Steel (HSS), Polycrystalline Cubic Boron Nitride (PcBN), or ceramic in a single setup. The foundation for precise sharpening processes consists of two vertically configured grinding spindles, which enable efficient multi-level machining and thus resolve issues associated with fixed and floating bearings commonly found in competitor machines. Furthermore, the grinding wheel set at the pivot point of the C-axis and the wear-free linear induction motors on the X, Y and Z-axes ensure a lifetime of accuracy and stability.

The all-rounder adapts to any sharpening process

Thanks to the configurable spindles, tool manufacturers can customise both the speed and the power for each tool and cutting material. The optimised spindle transmission ratio guarantees a constant torque, which is delivered by the compact, powerful and energy-efficient motor. The machine rigidity of the VGrind infinity linear and the intelligent cooling concept, which ensures thermal stability with plate heat exchangers, achieve remarkable tool precision. If required, the VGrind infinity linear also runs through a defined warm-up programme for thermal stability at the start of a shift. As soon as all monitored operating parameters are within the target range, scheduled production starts automatically, shortening set warm-up times.

In terms of tool dimensions, the VGrind infinity linear is capable of machining micro tools with diameters from 0.2 mm up to large drills and milling cutters with diameters of

200 mm. All of this with tool lengths of up to 360 mm. The machine has various steady rest systems for short and long tools as well as top clamp supports, ensuring precise machining with the integrated laser measuring system that can measure cylindrical tools up to 32 mm in diameter.

Automation for round-the-clock production

Several automated systems facilitate unmanned operation around the clock. Tools with varying shank diameters can be accommodated, while the HP 170 pallet magazine automatically supplies up to 900 shank-type tools to the machine. An optional camera system can optically locate and orientate blanks with coolant holes down to 0.05 mm. The HC 4 and HC 4 Plus chain magazines can be employed to provide various shank-type and HSK tools and the internal pallet loader offers space for up to 300 shank-type tools. An eight-position grinding wheel changer ensures maximum autonomy and a diverse range of variants for tool production. Additionally, the IoT gateway, integrated as standard, manages the data flow between the machine and the digital environment.

"Customers can use the VGrind infinity linear to automatically produce small batch sizes with variable tool diameters or even large series and the machine also has the flexibility to set up complex sharpening processes quickly, precisely and reliably," says Tobias Trautmann, managing director of VOLLMER. "With this machine, we have an all-rounder that bears the name 'infinity' for a reason, as it opens up

endless possibilities for customised tool grinding."

With its comprehensive range of machinery, the VOLLMER Group, which has sites in Germany, Austria, Great Britain, France, Italy, Poland, Spain, Sweden, the USA, Brazil, Japan, China, South Korea, India and Thailand, as well as representative offices in Taiwan and Indonesia, enjoys global success as a tool machining specialist in the areas of both production and service. The technological leader's range of products includes the most advanced grinding, eroding, laser and machining tools for rotary tools and circular saws in the woodworking and metalworking industries, as well as for metal-cutting band saws. In offering this, VOLLMER draws heavily on the company's long-standing expertise and its strengths: Local contacts for efficient communication channels, quick decisions and rapid action by a family-run company. The VOLLMER Group currently employs approximately 800 workers worldwide, with around 580 of these at the headquarters in Biberach alone, including more than 75 trainees. The company invests around eight to ten percent of its turnover in the research and development of new technologies and products. The VOLLMER Group is a reliable partner and provider of technology and services to its customers.

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ANCA launches InsertsPRO

The complete software solution for indexable and special insert grinding

ANCA, a global leader in CNC grinding technology, has launched InsertsPRO, its new Special Inserts grinding package. This powerful, flexible and universal software solution supports manufacturers operating in the fast-growing insert grinding market, an industry estimated in the billions globally, with indexable inserts making up a huge proportion of cutting tool consumption.

InsertsPRO supports ISO-standard inserts sourced from global catalogues, suitable for any milling or turning machine, as well as customer-specific special inserts developed for optimised applications, all on a seamless, automated platform. Designed to deliver flexibility, speed and premium quality output, InsertsPRO is the smart choice for tool makers looking to reduce costs, optimise cycle times and future-proof their production.

Manufacturers can leverage ANCA's MX7 platform to access the full functionality of InsertsPRO and further process optimisation, e.g., wheel capacity, cost reduction per part, can be achieved using other ANCA platforms.

"InsertsPRO is ANCA's answer to the market's demand for a universal, high-performance insert grinding solution," says Eduard Kleinschmidt, ANCA Inserts product manager. "With unmatched flexibility and automation, it empowers our customers to produce inserts efficiently, accurately and profitably, all within one intuitive software environment. Grinding inserts without limits is absolutely what we can now deliver."

High-quality tools and profitability in one package

InsertsPRO delivers:

- Faster setup and changeovers through automation and smart workflows.
- Reduced operator intervention and downtime for greater productivity.
- Lower production costs with optimised grinding strategies.
- Advanced simulation for first time-right production and fewer scrap parts.
- Seamless integration into existing ANCA ToolRoom RN35 workflows.

Whether for threading tools in automotive, profile inserts for aerospace, or custom geometries in medical machining, InsertsPRO enables manufacturers to unlock unmatched flexibility, automation and profitability.



High-quality inserts produced all in one package.

Why InsertsPRO is making a difference

Indexable inserts form a critical part of modern machining across industries such as automotive, aerospace, medical devices and advanced materials. Manufacturers are seeking ways to reduce setup times, manage frequent changeovers and scale automation for consistent quality. Across applications demand is rising for specialised profile inserts that can deliver tighter tolerances, higher productivity and reduced material costs.

"InsertsPRO isn't just software, it's a future-ready platform that transforms insert grinding into a smart, automated, Industry 4.0 process," adds Eduard Kleinschmidt. "We're proud to bring ANCA's innovation, precision and reliability into the insert segment, giving our customers a competitive edge in a fast-growing market."

Flexible grinding with practical automation and productivity features

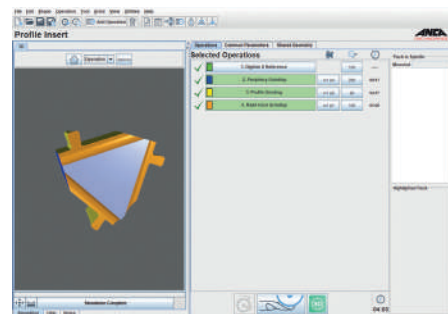
InsertsPRO is fully integrated into ANCA's ToolRoom RN35 software and existing ToolRoom users can upgrade to enjoy a comprehensive suite of features, bringing modern insert grinding capabilities to their current machines:

- **Advanced simulation tools:** High-resolution 3D visuals, grinding path simulation and integrated measurement.
- **Flexible profile and rake face design:** Profile editor or DXF overlay with precise lead-in/out control.
- **Multiple cutting-edge support:** Uniform edge geometry with automated X-axis rotation.
- **Flexibility in clamping orientation:** Fast changeovers with advanced transformation.
- **Optimised relief and rake grinding:** Wide range of styles, wheel types and compensation options.
- **CIM3D integration:** Process validation,

collision detection and optimisation for first time-right production.

Future ready insert grinding

With Industry 4.0 transforming manufacturing, InsertsPRO positions ANCA as a key partner for insert production, offering a software-driven solution without limits. By combining automation, flexibility and precision, InsertsPRO helps cutting tool manufacturers scale efficiently, adapt to evolving applications and achieve consistent quality with a wide range of insert types.



Finished part simulation for virtual validation.

ANCA EPX-SF revolutionises tool quality

At EMO 2025 in Hannover, Germany, ANCA launched the EPX-SF stream finishing machine, designed to complement its advanced tool grinding systems. By integrating the stream finishing process, cutting tools achieve a level of precision and performance beyond what grinding alone can deliver.

Duncan Thompson, ANCA product manager, explains: "Customers are always looking for ways to differentiate themselves in the market. ANCA grinders already produce cutting tools with unique geometries and micron-level tolerances. The EPX-SF takes this further, delivering sub-micron control of tool design and geometry. While these changes may seem small, the improvements in tool performance and life are undeniable, making your tools stand out in a competitive market."

The EPX-SF stream finishing process works by immersing cutting tools in a rotating barrel of media, carefully selected for the tool material and desired results.

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De-risking the transition as specialty vapour degreasing fluids are withdrawn

by Elizabeth Norwood, senior chemist, MicroCare LLC

The announcement that a major manufacturer will withdraw its widely used specialty vapour degreaser cleaning fluids by the end of 2025 presents a significant challenge for surface finishing operations. Workshops that have relied on these fluids for years now face a limited window to adapt. Delays in planning can lead to supply shortages, rising costs, production downtime and compromised surface quality if substitutions are made without careful evaluation.

This transition reflects broader industry pressures. Evolving environmental, health and safety expectations, as well as changes in chemical availability, are increasingly affecting production lines. For surface finishing operations, the challenge is not simply finding a replacement fluid but managing the change in a way that keeps process integrity, operational efficiency and high-quality output.

Understanding the risks

Cleaning fluids are essential for surface preparation, adhesion and overall finish quality. When a trusted fluid is withdrawn, production teams must act quickly to de-risk their processes. Even minor deviations in cleaning performance, such as incomplete residue

removal or inadequate drying times, can compromise high-quality finishes and lead to downstream issues like coating failures, poor adhesion, corrosion, or part defects. In many workshops, the loss of a long-standing cleaning fluid prompts urgent reviews of processes that have otherwise remained stable for decades. Teams must evaluate not only the cleaning fluid itself but also associated process steps, such as pre-cleaning, drying and handling, to ensure consistent results. Without this assessment, even a high-performance replacement may not deliver the expected outcome.

Drivers behind the transition

The move away from legacy vapour degreasing fluids is largely driven by operational and industry pressures, including sustainability goals, environmental responsibility and workplace safety expectations. While these changes support long-term efficiency and compliance, they also introduce operational challenges.

Cleaning fluids selected for decades based on characteristics such as evaporation rate, surface tension, or solvency power cannot always be swapped without affecting process



Technician inspecting metal part in cleanroom: Surface cleanliness directly affects coating adhesion, corrosion resistance and final finish quality.

performance. Differences in behaviour, for example, how a fluid spreads across a surface, penetrates recesses, or dries, can affect cleanliness. Understanding these subtleties is crucial to keeping finish quality and operational continuity.

Production vulnerabilities

The absence of a trusted cleaning fluid creates multiple vulnerabilities. Equipment designed for specific fluid properties may not run optimally with alternatives. Inconsistent cleaning can compromise downstream finishing operations, leaving residual oils, polishing compounds, or fine particulates on surfaces. This can lead to coating defects, reduced corrosion protection, or premature part failure.

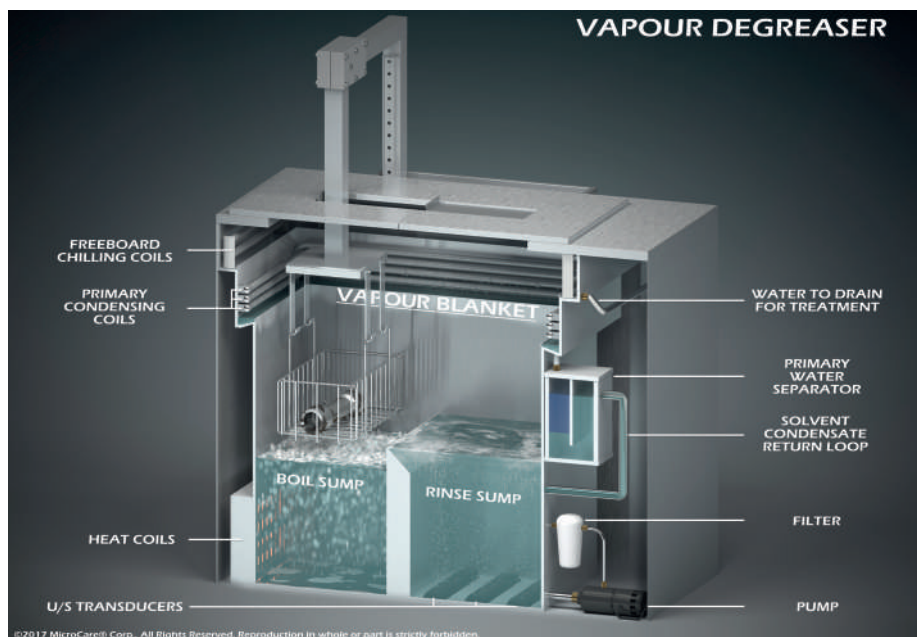
Operational risks also extend to workflow and staffing. Operators may need added guidance when introducing a new fluid and any lack of familiarity with updated procedures can result in inconsistent results. Finding and addressing these vulnerabilities early is critical for a smooth transition.

Managing the transition

Rather than treating a fluid change as a simple swap, manufacturers should view it as an opportunity to review and optimise processes.

Key considerations include:

- **Cleaning cycle times:** Ensuring that parts spend the correct amount of time in each stage to remove all contaminants.
- **Material compatibility:** Confirming that all metals, coatings and surfaces stay unaffected by the new fluid.



Vapour Degreaser: Vapour degreasing remains a critical step in precision cleaning for metal and electronic components.

- **Residue control and drying:** Verifying that surfaces are clean, dry, and free from deposits or films.
- **Energy and efficiency impacts:** Evaluating how changes affect throughput, fluid use and energy consumption.

Some operations implement multi-stage cleaning, combining methods to ensure thorough contaminant removal. Others introduce closer monitoring, data collection and tighter process control to guarantee predictable performance. For example, checking the cleanliness or dryness of parts after cleaning can highlight inconsistencies early, allowing operators to adjust the process before full-scale production.

Operator training is equally important. Ensuring staff understand changes to process steps, handling, and inspection criteria reduces errors and supports consistency. In practice, workshops often run trials on small batches to build confidence and refine parameters before full-scale implementation.

Balancing performance, compliance and sustainability

Any cleaning fluid transition involves three interlinked priorities:

1. **Performance:** Parts must be consistently clean, dry and ready for later finishing.
2. **Compliance:** Handling, storage and disposal must meet workplace safety and environmental expectations.
3. **Sustainability:** Cleaning systems should minimise emissions, waste and energy consumption.

Collaboration with vapour degreasing equipment and fluid suppliers is invaluable. Technical guidance, trial support and

workflow-specific recommendations help ensure that new fluids perform consistently without compromising safety or operational continuity. For example, suppliers can advise on best cycle durations, spraying or rinsing techniques and maintenance practices that keep quality while improving efficiency.

Testing and validation

Comprehensive validation is critical. Pilot trials allow teams to confirm that the replacement fluid removes contaminants effectively without damaging surfaces. Residue testing is particularly important; even trace contamination can affect coating adhesion, appearance, or performance. Documenting outcomes, including cycle times, fluid consumption, energy use and cleaning results, supports long-term optimisation and quality assurance. Structured testing also familiarises operators with updated procedures, reducing the risk of errors and ensuring consistent results once full-scale production begins.

Future-proofing operations

Manufacturers that proactively check cleaning fluid availability, process performance and operational trends are better positioned to avoid production interruptions. Some invest in equipment capable of handling multiple fluid types, offering flexibility for future transitions. Others redesign workflows to allow easier containment, recovery, or low-temperature operation.

Adopting such strategies can turn potential operational risks into opportunities for efficiency gains, waste reduction and improved workplace safety. In practice, facilities may also

consider enhanced process monitoring, such as logging cleanliness metrics to catch deviations early and support consistent quality.

Practical recommendations

For surface finishing operations approaching the 2025 fluid withdrawal deadline, prompt action is essential. A structured approach might include:

1. **Assess current processes:** Name all fluids, equipment and potential operational risks.
2. **Engage technical partners:** Collaborate with suppliers for guidance, pilot testing and workflow recommendations.
3. **Conduct pilot trials:** Confirm cleaning performance under real production conditions and document results.
4. **Train operators:** Ensure staff are fully familiar with updated procedures and safety protocols.
5. **Monitor and optimise:** Track cleaning efficiency, fluid use, energy consumption and finish quality over time.

By following these steps, manufacturers can keep both operational continuity and finish integrity.

Turning a challenge into opportunity

The withdrawal of long-standing specialty vapour degreasing fluids presents both a challenge and an opportunity. Manufacturers that take a proactive, structured approach, through early trials, careful validation and close collaboration with suppliers, can support high-quality outcomes while minimising operational risk.

De-risking the transition is not merely about swapping one fluid for another; it is about understanding process dependencies, safeguarding finish quality and building resilient workflows. By planning carefully, documenting processes and training operators, manufacturers can manage fluid withdrawals without disrupting production or compromising finish quality.

Author information:

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

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Inspecting metal parts: Rigorous inspection, testing and validation confirm that replacement fluids deliver consistent cleaning performance.

MecWash powers component cleaning at Watson Marlow



Ian Harvey, value stream manager, with the MecWash MWX400.

Watson-Marlow Fluid Technology Solutions (WMFTS), has strengthened its manufacturing capability with the installation of a MecWash MWX400 aqueous cleaning system. The investment follows the success of an existing MecWash already in operation within the group, which has consistently delivered exceptional results.

WMFTS has over 60 years of engineering expertise in high-quality peristaltic pumps and fluid handling solutions, supplying critical components to industries ranging from industrial manufacturing and pharmaceuticals to biotechnology and food production. WMFTS identified the need to upgrade its cleaning process to meet stringent ISO 13485 medical device quality standards. WMFTS also needed to increase productivity.

Previously, the business relied on semi-automatic and manual cleaning methods. While functional, these processes were labour-intensive, inconsistent and less efficient. The company required a robust, automated system capable of delivering repeatable

precision cleaning of machined pump components. The components are made from a variety of materials including glass-filled nylon, stainless steel and aluminium. The company required the capability to clean multiple types of components simultaneously.

The initial stages of the discussion between the MecWash team and the customer was designed to understand the specific cleaning challenges and establish the optimum parts washing system for their application. This process involves MecWash's in-house laboratory and the design team to build the optimum system, process and chemical solution to meet the specific needs of the customer.

Taking the time to carefully understand and evaluate these requirements, the MecWash team has only one aim: to provide the customer with a component cleaning system which delivers superior performance and ongoing reliability, as economically as possible.

Paul Jarratt, MecWash sales manager, comments: "Achieving the highest cleanliness standards is crucial for WMFTS. Even the

smallest levels of contamination can have significant long-term detrimental effects so it was vital to implement a solution that absolutely guarantees spotlessly clean and dry components.

"After reviewing WMFTS's requirements, it was clear the most effective system for them was the MWX400. The MWX400 combines ultrasonics with high-flow washing, rinsing and hot air drying, to deliver outstanding results across multiple materials and it also has the capability to clean multiple types of components simultaneously.

"We were delighted to have met the cleaning requirements of WMFTS. The MWX series is proven to meet the toughest challenges in parts washing. It is robust and combines precision cleaning with 24/7 dependability."

Since installation, the MWX400 has delivered significant operational and quality improvements:

- **ISO 13485 compliance:** Contributed to WMFTS achieving the stringent ISO 13485 quality standard.
- **Assured cleaning and drying:** Reliable, repeatable results across all component types.

- **Elimination of manual cleaning:** 100 percent removal of labour-intensive manual cleaning tasks.
- **Supplier component cleaning:** Extra capacity enables WMFTS to clean supplier components to the same high standards.
- **Improved drying:** Components emerge drier, reducing handling time.
- **Productivity gains:** 20 percent increase in throughput within the cleaning area.
- **Flexibility:** Ability to clean mixed batches of different components in one cycle.

Ian Harvey, value stream manager at Watson-Marlow Fluid Technology Solutions, comments: "We already had a MecWash within the group which has proved to be very reliable and give great results. The MWX400 has not only delivered the quality and consistency we needed but also improved productivity and freed our team from manual cleaning tasks."

John Pattison, managing director at MecWash, shares his confidence in working with customers from the hydraulic power sector: "The improvements to the efficiency of the cleaning process at WMFTS is a testament to the reliable power of the MecWash MWX400 system. Our parts washing systems are trusted by international blue-chip companies and numerous Tier 1 and Tier 2 fluid power component manufacturers. We are confident the MWX series provides the most rigorous component cleaning in global manufacturing."

"The MecWash approach ensures that our customers are fully supported throughout the product lifecycle. The large amount of repeat business at MecWash is a testament to the long-term relationships we have built with our customers."



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New turbines from Rösler guarantee improved equipment availability and a 25 percent higher blast performance



The suitability of the high-performance Ruten Gamma turbines, type 330-HD, for this particular customer application was proven through extensive processing trials at the Rösler customer experience centre in Untermerzbach.

Secure spare parts supply and improved blast performance, these were the reasons why a manufacturer of saw bands invested in ultra-modern new turbines for a belt shot blast machine. The customer chose the Ruten Gamma 330-HD high performance turbines from Rösler not only because of their extremely wear-resistant design. He was equally impressed by the 25 percent higher blast performance with, at the same time, lower energy consumption. In the meantime, the customer decided to equip other blast machines in his manufacturing organisation with Rösler high-performance turbines.

The saw-bands produced by this company are known all over the world for their superb quality. These steel strip products offer excellent precision, for example, exact edge dimensions and perfect flatness. To maintain its quality standards, the company makes all its products in Germany, even though around

90 percent are exported to other countries. A key stage in the manufacturing process is a shot blasting operation in a belt blast machine.

Improved shot blast performance and secure spare parts supply

The machine used for this shot blast operation, supplied by a manufacturer in Southern Europe, urgently needed to be modernised. Therefore, the engineer responsible for streamlining manufacturing operations discussed the customer requirements with the Rösler team during a visit at the Deburring Expo exhibition. The topic of this conversation was not only a secure spare parts supply and first-class technical service but also improved blast performance to provide a higher workpiece throughput. Based on the detailed process parameters provided by the customer, Rösler developed a technical concept and submitted a quote for retrofitting the turbines on the existing

blast machine. The quote included the installation of two high-performance Ruten Gamma turbines, type 330-HD, each with a power of 7.5 kW. This corresponds to the power of the original turbines. The feasibility of the offered turbines was proven through extensive processing trials in the customer experience centre at Rösler with the actual customer workpieces.

Faster blast cycles with less energy consumption and lower wear

The high performance of the Ruten Gamma turbines is based on their special design. They contain four Y-shaped throwing blades with a precisely calculated blade curvature. This guarantees an extremely precise blast media acceleration and delivery at maximum throwing speeds and, compared to conventional turbines, a significantly improved shot blast efficiency. The new turbines increased the blast

performance of the existing shot blast machine by roughly 25 percent and, thus, produced a significant increase of the shot blasting capacity. Moreover, the efficient blast media delivery offers savings in energy consumption of up to 25 percent. The throwing blades are made from an extremely wear-resistant steel alloy, and their special design allows the use of both blade sides. Therefore, depending on the utilised blast media, the Rutten high performance turbines guarantee a 10 to 16 times longer service life than conventional turbines. These technical features, combined with the reliable and fast Rösler spare parts service, ensure a significantly higher equipment uptime with, at the same time, lower costs for maintenance.



Depending on the utilised blast media, the Rutten high performance turbines guarantee a 10 to 16 times higher uptime than conventional blast turbines.

Quick turbine exchange and optimisation of the entire shot blast machine

The turbine exchange on the blast machine, originally supplied by another manufacturer, was achieved in a relatively short time period. Besides a relatively minor adaptation of the original mounting flange, it required no additional modifications. At the same time the turbines were replaced, the maintenance team of the customer and Rösler engineers fine-tuned the existing shot blast machine to the higher blast performance. Among other steps, the blast chamber was lined with additional wear plates. About one year after the new turbines were installed, this saw band supplier is extremely satisfied with the Rutten high performance turbines. Therefore, he plans to modernise additional blast machines in his manufacturing organisation, which were supplied by the manufacturer in Southern Europe.

For over 90 years, the privately owned Rösler Oberflächentechnik GmbH has been actively



The throwing blades in Y-shape, used in the Rutten Gamma turbines, are made from a highly wear resistant steel alloy, and, therefore, ensure extremely long uptimes.

engaged in the field of surface preparation and surface finishing. As a market leader, it offers a comprehensive portfolio of equipment, consumables and services around the mass finishing and shot blasting technologies for a wide spectrum of different industries. Its range of about 15,000 consumables, developed in its customer experience centres and laboratories located all over the world, specifically serves customers for resolving their individual finishing needs. Under the brand name AM Solutions, it offers numerous equipment solutions and services in the area of additive manufacturing/3D printing. Last-but-not-least,

as our central training centre the Rösler Academy offers practical, hands-on seminars to the subjects mass finishing, shot blasting and additive manufacturing. The Rösler group has a global network of 15 locations and approx. 150 sales agents.

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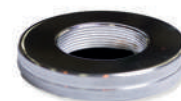
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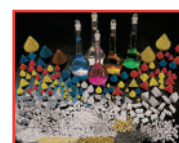
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Developed for brightening non-ferrous metals, such as brass and copper components, Formula PB is engineered to cavitate and de-gas efficiently.



Formula HD- Heavy Duty

This powerful aqueous-based, highly alkaline solution is specifically formulated for cleaning ferrous metals, effectively removing heavy oil, grease and carbon contaminants.

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