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New machines a Hardinge theme in 2020

The early months of 2020 have seen two of the Hardinge grinding companies launch brand new machines adding to the group's highly comprehensive capability covering virtually every grinding technique.

January saw the unveiling of the all new Voumard 1000 ID/OD grinding machine which its designers describe as setting "a new standard in ID grinding" and will provide customers with "the ultimate combination of precision and performance in an affordable machine".

This was followed in March with the launch of a new Kellenberger machine, the Kellenberger 10, which is a highly cost effective, universal cylindrical grinder suited to precision grinding operations undertaken by both skilled and semi-skilled operators.



Programming using Kellenberger BLUE solution software features fast, intuitive programming and retooling and a remote diagnostic feature, extending the opportunities for using the machine on a wide variety of applications across the machine shop. It can accommodate workpieces up to 1,000 x 400 mm in size with a top weight of 100 kg.

Manufactured from proven Kellenberger components and assemblies, there is inherent reliability within the K10 coupled with the ability to greatly expand or customise its capability by adding a range of optional equipment. It features an extremely stable sub-frame to minimise external influences and vibration which can affect surface finish, all-round component quality and sustained process accuracy.

The table profile is also a proven Kellenberger design with the full-length dressing interface located on the rear of the table to reduce retooling work and extend the wheel dressing possibilities.

The machine features generous X- and Z-axis strokes (X=365 mm/Z=1,150 mm), collision-free operation and dressing ratios. The low-maintenance, high-precision linear guide on the X-axis and the V flat sliding guides on the Z-axis are equipped with optical absolute linear position measuring systems. The B-axis is designed as an automatic indexing axis (1° Hirth gearing) with high positioning accuracy and +30°/-210° swivel range.

For optimum productivity and flexibility, the universal grinding head can optionally be equipped with two Ø500/400 mm O.D. grinding wheels. Powerful high-frequency, grease-lubricated I.D. grinding spindles with direct drive are available in two speed ranges (6,000 - 40,000 rpm and 10,000 - 60,000 rpm).

The Kellenberger 10 is equipped with a cost-optimised FANUC 0i-TFP CNC control with a 19" touch screen.

It completes a highly competent machine that will offer any manufacturing or development operation the ability to cost effectively produce high precision components fully utilising the available skills of the work team.

Jones & Shipman Hardinge Tel: 0116 201 3000
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New dates announced for GrindTec 2020 and MACH exhibitions



GrindTec 2020

International Trade Fair for
Grinding Technology

10 - 13 November • Messe Augsburg • Germany

Due to the growing concerns about the impact of the Coronavirus epidemic, two major events have been rescheduled. GrindTec 2020 will now take place from 11th to 13th November in the Augsburg Exhibition Centre, while MACH 2020 has been cancelled and transferred to 25th to 28th January 2021.

GrindTec is the most important platform for the grinding technology sector worldwide. Particularly in economically challenging times, the industry needs this event, which contributes significantly to the promotion of exports.

Henning and Thilo Könicke, managing directors of trade fair organiser AFAG Messen und Ausstellungen state: "We're pleased that we can inform our partners, exhibitors and visitors of a new date for the GrindTec 2020 at short notice and thus can already give them some certainty for their planning. We're delighted that the world's leading trade fair for grinding technology can continue to stay in Augsburg and would like to thank the City of Augsburg for their support with the short-term implementation. In determining this new date, we've taken particular care to ensure that the event does not clash with other events in the sector. We believe that we have found the best possible date under the current circumstances."

Starting with the next event in 2022, the GrindTec will again take place at its traditional date in March.

Up-to-date information is available on a regular basis at www.grindtec.de

AFAG Messen und Ausstellungen GmbH
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www.grindtec.de

Meanwhile, The Manufacturing Technologies Association (MTA), which owns and runs the MACH exhibition on behalf of the industry, has taken the decision to reschedule MACH from April 2020 to January 2021.

Given the spread of the Coronavirus, the MTA has decided that, in order to minimise the risks to visitors and exhibitors, and to ensure that the event is as positive as they deserve, MACH should be moved to 25-28 January 2021 in the same Halls, at the NEC.

This decision has not been taken lightly, but it believes that it is in the best interests of the industry and those who work in it. The MTA's priority is, of course, the health and safety of the 30,000+ people who will visit and work at MACH. In addition, it believes that by moving MACH to January 2021 it can offer a better experience for visitors and better value for exhibitors than by holding it in April 2020 under the conditions likely to be in place at that time.

All existing stands will be transferred to the new event at the same size and position

on the floorplan, within the same halls on the Atrium side of the NEC. As part of this, the NEC have agreed to carry forward any service orders placed or paid for with them (electrics, compressed air etc). The exhibition will run for four days with extended opening hours, meaning that the exhibition will be open for a similar time as had been planned in April. The organiser is working hard to finalise the details of the rescheduled show and revised paperwork will be issued shortly.

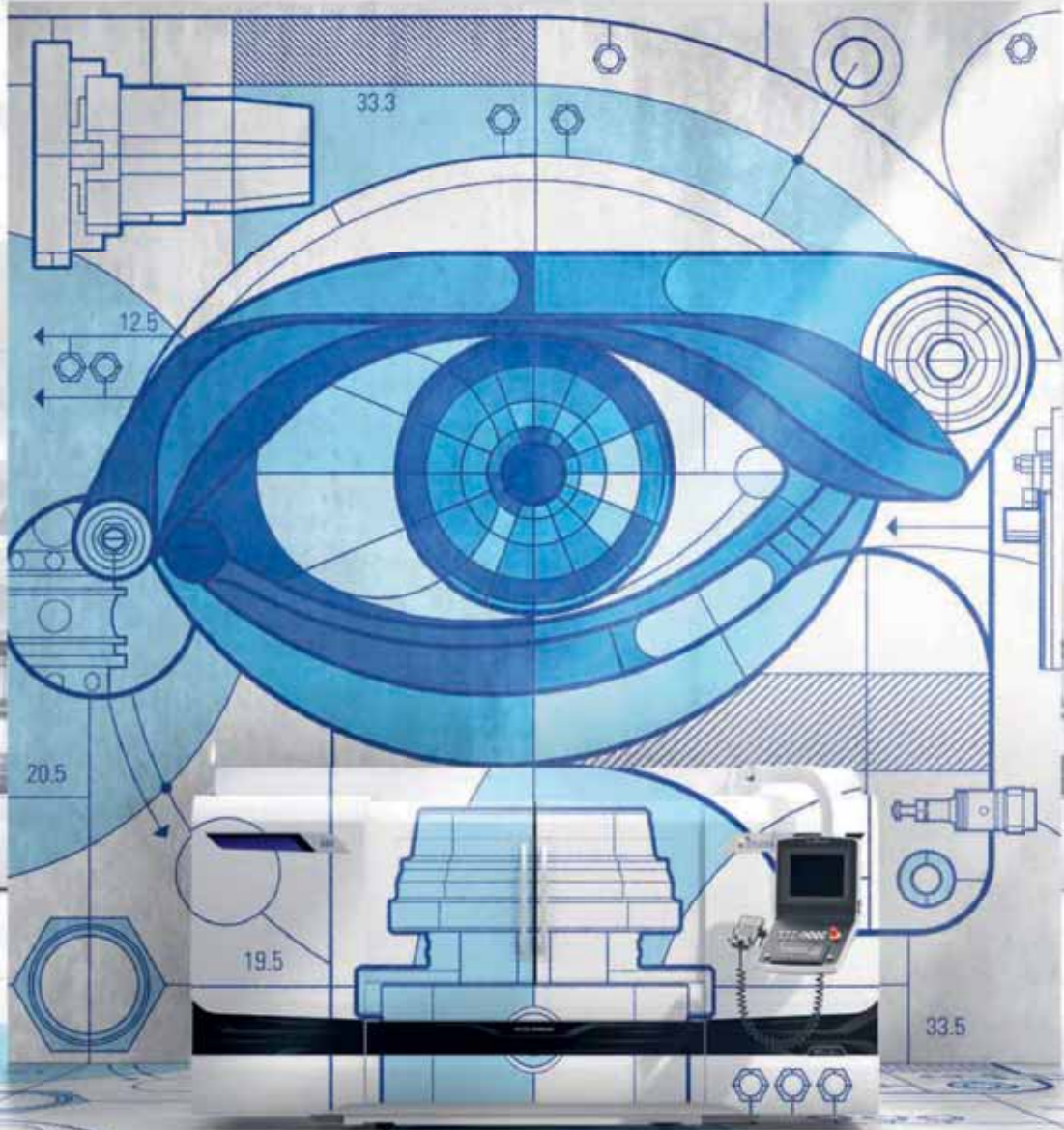
The MTA believes strongly that this new date will benefit the event and provides the best possible platform for both exhibitors and visitors to do business at a time that the UK enters its post-Brexit transition phase.

Manufacturing Technologies Association
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www.mta.org.uk



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Fritz Studer AG, established in 1912, is a market and technology leader in universal, external and internal cylindrical grinding as well as noncircular grinding. With around 24,000 delivered systems, STUDER has been synonymous with precision, quality and durability for decades.

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 **STUDER**

STUDER increases its market share again in 2019

After a record year in 2018, Fritz Studer AG has reported another very successful year in 2019. With the third best annual turnover in the company's history, the cylindrical grinding machine manufacturer increased its market share again, despite difficult market conditions. One reason for its success is the high proportion of new customers, at almost 40 percent.

Once again, more than 60 journalists from all over the world made their way to the Bernese Oberland for the Motion Meeting. Under the motto "The Art of Grinding", the company presented some of the things that make it one of the leading manufacturers of cylindrical grinding machines.

At the annual press conference, CEO Jens Bleher reported a successful 2019, even if the economic situation has deteriorated significantly. "With the third best year in the company's history, we were able to further increase our market shares," said Sandro Bottazzo, the company's CSO. STUDER recorded strong growth in North America in particular, where it achieved the second best result in the company's 100-year history. The company was also able to further increase its turnover with internal cylindrical grinding machines. "In the Asian region in particular we maintained incoming orders for internal cylindrical grinding machines at the high level of 2018," continued Sandro Bottazzo.

Three machine types also achieved record incoming orders: the S121, the S141 and the S151, the flagship of internal cylindrical grinding machines. The new universal



cylindrical grinding machines, i.e. the favorite, the S33 and the S31, have also got off to a very successful start. "The launch of the new universal machines was both a feat of strength and a highlight," explained Jens Bleher. The company didn't even need a year to sell around 100 of the new machines. Customers underscore the top quality and precision of the new machines. In America a longstanding STUDER customer, that had purchased a new S31, was delighted that it could achieve another increase in reliability and precision.

The customer segments developed very differently in 2019. In the automotive sector

in particular, market conditions were much more challenging than in 2018. However, thanks to this broad diversification, Fritz Studer AG was able to offset weaker market segments with stronger ones. For example, the aviation industry was one of the segments that flourished in 2019. "Our company has also been very well positioned in the aerospace customer segment for many years and is a preferred supplier of many component suppliers," explained Sandro Bottazzo, when reviewing the past year. STUDER sees one key to its success in its global customer-focused sales and service organisation. This is also one of the reasons why the proportion of new customers was almost 40 percent last year. Smaller markets, like Great Britain, also achieved a very good order intake in 2019. Finally, the market share was also increased in the company's home market of Switzerland.

Customer Care

Customer Care was further developed in 2019 and the organisational changes initiated in 2018 and 2019 were successfully completed. Fritz Studer AG also increased its number of service technicians again. "In Italy and France, in particular, we were able to employ more new service technicians last year, enabling us to provide even quicker and more competent on-site support," explained Sandro Bottazzo. Machine overhauls and maintenance achieved a new record turnover. Both service areas enjoyed a double-digit increase once again. Sandro Bottazzo added: "Machine overhauls are an important business area for us and ideally complement our new machine business. This means that our customers can have the complete range, from new machine through to machine overhaul, from a single source."

Exciting times for technology

2019 was also very exciting for STUDER's system division. Various new projects have been started, advanced and completed. For example, thanks to STUDER WireDress® it was possible to reduce the cycle time for an application from the medical sector by a whole 70 percent. A life cycle solution project was carried out in Biel, in which ceramic components for use in mass spectrometers were form-ground with high precision in several grinding trials with the





customer. "You can expect a new product from the STUDER company in a few months," promised Daniel Huber, CTO at Fritz Studer AG. This is a new hydraulic synchronous tailstock. "The hydraulics of the redesigned synchronous tailstock have been replaced by a servo drive with an electrical clamping function. The repeatability and accuracy of the clamping force have been increased to the exact gram. An even lower contact pressure can now also be selected," continued Daniel Huber.

The digital world of the UNITED GRINDING Group

Four fundamental priorities for the Group's digitalisation strategy have been developed from a wide range of digital projects. "Connectivity, Usability, Monitoring and Productivity: these are the digital pillars of UNITED GRINDING Digital Solutions," explained Daniel Huber. In the area of Connectivity, the umati standardised communication interface provides the long-awaited possibility of simply connecting any machine, which is umati-capable, to the Production Monitor and monitoring its operating status. "Digitalisation is also finding its way into production. As a user of our own machines we are the internal customer, so to speak, and support our developers with practical

tests and suggestions for product improvements from the user's point of view," explained Stephan Stoll, COO of Fritz Studer AG.

Investments in the future

Further significant investments were also made at the Steffisburg location in 2019, underlining the commitment of the UNITED GRINDING Group to Switzerland as a workplace. A major project for modernisation of the company's cubic production was successfully completed last year. "Technically harmonised milling centres allow automated, high-precision manufacturing of our key components," said Stephan Stoll. A further investment was also made in component production and implemented this year. This concerns the complete production of spindle shafts, a key component for the function and precision of the grinding machines. "We also want to maintain and develop our expertise and efficiency here and increase our internal value added. Naturally we will continue to use the latest production and process technology and a reasonable degree of automation," he explained.

Further smart factory projects

Tool management in component production has also been updated. The

entire life cycle of a tool is now digitally controlled and monitored. Each tool component has a digital marking by means of a chip or smart code and can be allocated to a preparation process, an order or a machine. The control cabinet design and assembly process chain also hold potential, which can be optimised with digital support. With the use of digital tools, the entire process chain from electrical engineering through to the assembly of a control cabinet can be carried out efficiently and partially automated. "Finally, digitalisation is also finding its way into assembly," said Stephan Stoll. Instead of using outdated drawings, the assembler drags the most recent data as a 3D representation directly onto the screen at the workstation and has optimal working documents. Via a chat function the employee can easily send questions and ideas for improvement to the relevant engineering department and create a short and direct feedback loop.

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Hardinge unveils new standard for ID grinding

New innovative hydrostatic guideways standard on all axes provide highest performance across ID grinding applications

Hardinge Inc., the leading international provider of advanced metal-cutting manufacturing tool solutions and accessories unveiled the new VOUMARD® 1000 Universal CNC Internal grinding (IG) machine at a special presentation at the AUTOBAU AG showroom in Romanshorn, Switzerland. The latest innovation offers a high-performance, economical grinder for the widest range of universal internal grinding requirements to obtain fine surface finishes and tight tolerances. Designed and manufactured with Hardinge's high quality and focus on innovation, the all new VOUMARD 1000 is a new standard in ID grinding, providing customers with the ultimate combination of precision, performance in an affordable machine designed to optimise production costs when manufacturing high-precision parts for industries ranging from aerospace to medical.

For over 80 years, the Voumard brand has been a global leader in innovative ID/OD grinding, with almost 10,000 installed internal grinding machines around the world. This product line has been specifically designed for machining workpieces with larger diameters and/or lengths. Typical applications are grinding operations on parts for hydraulic components, spindles, bearings or gears, for example.

"We are introducing a new system that incorporates feedback we received from

customers, from the rigid base to the hydrostatic guides in combination with direct drives on all axis, all the way to the new user interface on our controls," says Helmut Gaisberger, global director product management for Hardinge Grinding. "The new VOUMARD 1000 system exceed the most demanding of today's grinding requirements.

"As well as a traditional grinding machine design, the VOUMARD 1000 offers up to five fully functional CNC axes with outstanding positioning accuracies in the nanometer range, as well as best-in-class tool and workpiece management. The new concept substitutes additional movement for dressing and measuring devices."

The VOUMARD 1000 offers almost infinite configuration options for the widest range of grinding operations. The machine replaces the popular VOUMARD 110, VOUMARD 130 and parts of the VOUMARD 150 series. Prepared to machine workpieces with a length of 300 mm and 300 mm swing diameter over the table, customers can now benefit from the following features:

Innovative HYDROLIN® hydrostatic guideways provide the highest performance: the VOUMARD 1000 features the newest generation of hydrostatic guideways on all axis for superb precision and productivity. It provides excellent damping, stick-slip-free operation and high rigidity (wraparound guideway), resulting in

outstanding surface quality and more reliability without any friction loss and wear.

Ultra-precision accuracy with fast oscillation for even the smallest diameters to enhance productivity, the VOUMARD 1000's unique design does not have coupling joints to perform without any backlash, offer superior positioning accuracy-less corrections, as well as optimised thermodynamics in its direct drive linear motor system for better cooling management.

Unique, compact hydrostatic spindle turret configuration for ideal accessibility and larger spectrum of parts. The new system offers a hydrostatic B-axis, with benchmarking positioning repeatability.

Advantages in high precision also in non-round grinding and improved accessibility with compact "table turret" collision-free dressing; the table turret on the hydrostatic B2 axis, can optionally be equipped with a workhead and a high-precision rotation axis (C-axis) with direct measuring system and torque motor. Enabling maximum roundness and precision in the fine adjustment of the cylindricity of the inner diameter during cylindrical grinding. A large selection of clamping devices and steady rests completes the available options.

New compact, ergonomic machine design for better overview during grinding process and accessibility for best in class tool and workpiece management.

FANUC 31i control for improved operator access, fast programming and retooling, even for inexperienced operators. The latest BLUE solution software created specifically for the Hardinge grinding product brands will be available on the new VOUMARD 1000 with object guide for easy operation and short setup times. BLACK CAM solution for CAM functionality is available optional.

To learn more about the new VOUMARD 1000, visit: www.hardinge.com/product/voumard-1000

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Advanced grinding and finishing machines

Advanced Grinding Solutions (AGS) has the largest portfolio of production grinding and surface finishing equipment in the UK. It offers a complete solution to your needs from one source.

Rollomatic, the leading manufacturer of tool grinding machines is increasing its market presence with two grinding machines including one of its multi-axis cutter grinding machines that's available in the UK for the very first time. These machines are used by many of the leading cutting tool manufacturers to manufacture rotary tools such as end mills and drills to the tightest possible tolerances.

After its great success at the last MACH show that resulted in several sales, Rollomatic is continuing to promote its NP pinch-peel cylindrical grinding machine in the UK. It is used by many cutting tool manufacturers to quickly and easily cylindrically grind carbide and HSS tool blanks to diameter and form shape rather than to do so on multi-axis tool grinders whereby the blank preparation process on those machines takes considerably longer, is more expensive and is generally not as accurate. Cutting tool manufacturers are invited to receive a demonstration on the many advantages of the Rollomatic NP machine for blank preparation and to understand more about Rollomatic's wide range of multi axis CNC tool grinding machines.



New to the AGS offering, the DLyte machine, produced by GPA Innova, is the world's first dry electro polishing system. The DLyte range of machines use a totally unique, single step automated process, for polishing metals by ion transport using free



solid bodies. This is a revolutionary dry non-abrasive electro polishing process that does not use any liquid as the electrolyte. These new patented machines polish and deburr steel and stainless-steel, cobalt chrome, titanium, aluminium, nickel and precious metal alloys components for the dental, medical, aerospace, automotive and other industries. Typical applications include bone screws, artificial hip and knee joints, turbine blades, cutting tools, and any similar component whereby fine surface finishes to under $0.09 \mu\text{m Ra}$ are required without altering key part geometry after the previous grinding or milling process.

Unlike traditional polishing systems, the DLyte system obtains a consistent finish avoiding any polishing marks on the surface, such as those generated by conventional machining, and can process complex geometries without

generating any micro scratches on the surface. AGS managing director Chris Boraston comments: "After seeing the DLyte machine, we immediately recognised just how unique and special it was and the many advantages that it brings for the polishing of a wide variety of parts, many of which are ground on the grinding machines we already sell. We were so impressed with the



machine and its unique and patented dry polishing process that we decided to purchase our own demonstration machine which we plan to show on our stand at MACH."

Tschudin's new Cube machine, has a brand new and unique design. Like other machines within the Tschudin range, this CNC centerless grinding machine benefits from a granite bed and a unique axis arrangement that sees the workrest blade being mounted onto its own CNC axis. This allows components to be loaded to the centerless grinding machine outside of the working range of the machine. The Cube is targeted at those companies needing to quickly and easily centreless grind parts from 0.1 mm to 20 mm in diameter where operator's safety and easy and secure hand



loading is also a consideration as are the very fastest setup times.

Also new to the UK, Comat's super-filtration system delivers 2 µm filtration quality throughout the entire working cycle, thus maximising the quality of parts produced on machine tools whilst minimising lifetime running costs and maintaining maximum coolant consistency. Comat systems are customised to meet a specific client's needs allowing for maximum efficiency of the filtration process. Oil is filtered to a better quality than new unused oil on Comat systems. The remote monitoring of the performance of their filtration systems ensures effective after sales support and systems can be monitored in real-time during manufacturing processes and fine-tuned by Comat to ensure that optimum filtration quality is obtained at all times.

AGS also offers the FLP (Fine Grinding, Lapping and Polishing Machines) single sided lapping machine suitable for a variety of applications. The broad range of FLP machines includes for both twin wheel - double sided CNC lapping machines and also single-sided lapping machines. The size of machine ranges from the most basic of 400 mm in diameter up to the world's largest 100 tonne 4 m diameter monsters. Sadly, logistics prevent FLP from exhibiting the world's largest lapping machine, but customers are invited to discuss their requirements for the face machining of components.



The offering from Krebs & Riedel covers all grinding applications and best use of its range of grinding wheels. This includes conventional internal and external grinding wheels up to 900 mm in diameter

manufactured using aluminium oxide and silicon carbide with ceramic and synthetic resin bonds for most industrial grinding applications. Krebs & Riedel also offers vitrified diamond and CBN grinding wheels with ceramic bonds with a working speed of up to 200 m/s for internal, external and special grinding processes. Krebs & Riedel is



constantly introducing new types of wheels with improved grain structures and novel bonding systems that enhance grinding wheel quality and optimise performance.

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Perfect X-Series surface grinders add control to contour grinding

The two-machine X-Series of 2- and 3-axis surface grinders from Taiwan-based Perfect has long been a part of RK International Machine Tools' portfolio of precision grinding machines. Now, with the addition of full CNC in the form of the Siemens 828D control, these machines have gained even greater versatility, with the 3-axis versions now able to perform full contour grinding as standard.

The X25 includes a 250 mm x 500 mm table and the larger X36 with a 300 mm x 600 mm table, with 550 mm and 600 mm clearance between table and spindle centreline respectively. The X-Series provides high accuracy surface grinding at competitive pricing, with both variants featuring a construction developed through finite element analysis for added stiffness and support. Spindles are also high-performance P4 units with high-precision angular contact bearings delivering runout of < 2 µm. The spindle itself features an inverter giving users a choice of spindle speed to suit specific materials.

Craig Digweed, RK International Machine Tools' product manager, Grinding Products, comments: "With the addition of full CNC control from Siemens, the X-Series provides, as standard grinding cycles to cover surface, criss-cross, plunge, and pitch, with the same pitch and same depth. However, customers can now specify optional cycles such as stair, side, profile, and contour grinding giving them much greater control over their grinding operations."

Standard features of the X-Series machines are the use of servo motors on the cross, vertical and X-axes on the 3-axis variant, along with linear guideways on the cross and vertical axes and box ways on the X-axis on the 2-axis variant and linear guideways for the 3-axis machines. Table speed ranges from 1 to 25 m/min, dependant on machine specification with a cross feed of 1,100 mm/min on all machines. A table mounted, three-piece dressing diamond is standard, and to accommodate



The X-Series of surface grinders from Perfect are now available with full Siemens CNC control through RK International Machine Tools

the variety of additional grinding cycles, rotary and roller dressing devices are also available for wheel forming options.

RK International Machine Tools Ltd
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Performance, precision, sustainability

New developments for the 6S and 6L series
New linear motors and tried and tested hydrostatic guides in the 6S and 6L grinding machine series from Junker open up new potential. Higher speeds, various detailed improvements and optimised ease of maintenance result in shorter cycle times, maximised quality and cost savings.

The expanded modular concept for the table assemblies makes the platform 6 grinding machines flexible and adaptable. High-performance linear drives along the X- and Z-axes allow high travel and acceleration values alongside reduced assembly space. Hydrostatic round guides for the X-axes enable maximum dynamics, dampen vibrations and prevent sticking or slipping by producing minimum friction.

The latest measuring technology, such as in-process measurements combined with the latest control technology, helps to produce good parts from the very beginning of the grinding process. Table assemblies, such as workpiece spindles, tailstocks or steady rests, are installed on

standardised universal construction boards which can be positioned for various workpieces either automatically or manually.

The modular concept stands out thanks to a highly flexible component arrangement of table assemblies on guide rails in the working area and allows adaptation to future grinding tasks. The entire concept of the grinding machine revolves around easy access to all components in and on the machine plus optimised setup. Increased accessibility and serviceability reduce maintenance effort and costs. The complete cover for all guides and motors makes the grinding machine suitable for either oil or emulsion coolant.

The polymer concrete machine stand impresses with its outstanding damping performance and high torsional stiffness. The optimised machine bed rinsing makes maintenance easier, and piping for the media feed integrated into the machine stand allows for future machine upgrades. Decreased machine size also reduces overall transportation costs.



Innovations in the field of cooling, pumps and pressure regulation enable the removal of cooling media harmful to the environment and health. These environmental improvements, along with increased energy efficiency, reduce maintenance requirements and round off the developments on the new platform 6.

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Process control in grinding technology

A well-balanced grinding wheel means a reduction in machine spindle vibration, bringing a multitude of benefits, including extended spindle, bearing, wheel and dresser life, improved part geometry and surface finish. The ACCRETECH SBS Dynamic Balance System constantly monitors spindle vibration and automatically compensates for unbalance in the grinding wheel, working to preset vibration tolerances. The Dynamic Balance System can be incorporated by an OEM into a new grinding machine, or easily retrofitted to an existing machine by a grinding machine end user.

A new level of machine process monitoring

With an emphasis on self-teaching, the ACCRETECH SBS ExactControl™ system brings a new level of machine process monitoring and control to grinding machine users. "With the ExactControl™ card, acoustic emission, power, spindle current, vibration, temperature, torque and speed, can be used individually or in parallel for process monitoring. Grinding cycle data is saved automatically to the system" explains Tim Wood, general manager at ACCRETECH SBS.

The ExactControl™ system can accept up to eight acoustic emission sensor inputs using expansion modules; it can monitor two of these synchronously. For complex processes, multiple channels can be started independently.

Acoustic emission sensors reduce air grind time

ACCRETECH SBS will also display acoustic



emission sensor options, including rotary in-spindle, ring, and bolt-on types for different grinding and dressing applications. All ACCRETECH SBS acoustic emission sensors are designed to offer maximum sensitivity while surviving in the hostile wet zone environment of a production grinding machine. The acoustic emission sensors can be combined with either the ExactControl™ process control system or with a dedicated ACCRETECH SBS acoustic emission monitoring system called AEMSTM.

In-line measuring devices reveal the smallest defects in real-time

ACCRETECH SBS will also show an in-process measuring head dedicated for outside diameter (MOD gauge) as well as the in-process measuring head for internal diameter. The showpiece for ID

measurement will be the Pulcom V4 controller running Gamma 3 measurement heads with its unique Flex Finger. "The advantage is obvious: the flexible contact finger reduces setup changing time from three minutes to one minute. This enables also users who are reluctant to perform gauge setup to use the unit," says Janos Kudett, regional director Eastern Europe at ACCRETECH.

With the growing use of HSK and CAPTO type automatic tool changers on grinding machines, the ATC run-out detection system can monitor for abnormal run-out of a workpiece and triggers the machine stop function before any processing defects occur. The ATC run-out detection system is designed for harsh production environments in machine tools. The sensor is coolant resistant, operates in a temperature window of 0 to 40 °C and has a vibration resistance of maximum 3.66 G in both the X-, Y- and Z-axis.

In November 2019, Tosei America Inc, USA, a subsidiary of Tosei Engineering Corp, Japan, acquired the SBS balancer product line from Schmitt Industries Inc, USA and renamed the company ACCRETECH SBS Inc, USA. Its subsidiary Schmitt Europe Ltd in the UK, will in turn soon change its name to ACCRETECH SBS Europe Ltd.

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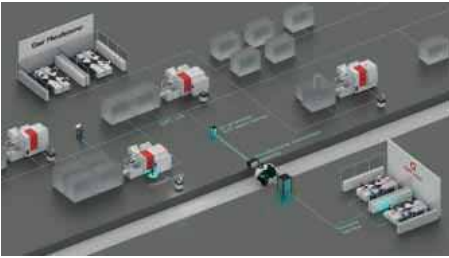
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Time savings, enhanced quality, increased system availability



High volume production requires top quality at increasingly shorter processing times. The machines are already technically very advanced. Great savings potentials are no longer to be found among the processing techniques, but rather within upstream and downstream process stages such as setup, measurement and communication between machine and measurement equipment. Kapp Niles has therefore developed a platform to tie together and automate these processes. Thanks to open standards such as umati and GDE, it even works on a multi-vendor basis.

There are different approaches to further increase the efficiency of production processes, for example by integrating as many process steps as possible into one machine. However, from a technical point of view, this is very complex and inflexible, and thus unreliable. This is why Kapp Niles chooses to go a different path: "Instead of integrated machines, we rather envision integrated production chains with as little manual handling between individual chain links as possible," explains Konstantin

Schäfer, head of product management. "We continue to develop from a pure machine manufacturer to a provider of solutions." This becomes apparent in the growing measurement technology sector, Kapp Niles Metrology. What's more, the existing portfolio is being optimised for production systems communicating with each other, in particular through the new KN assist platform, supporting the user with the KN grind control system software, from the project planning stage through production.

KN grind: a hands-on control system

As part of the project-related configuration, all required processing options are combined in one workpiece project. With the step-by-step intuitive user interface, concrete project data are collected. In a virtual setup process, the user selects the gear type and the suitable tools from a component set. Each step is displayed on a conventionalised machine (Photo 1). Upon request, KN grind also offers technological suggestions. Software development manager, Volker Zenker explains: "Unlike with previous releases, critical or incorrect values are displayed to the user. A sequential control allows for a straight-



Photo 2: The sequential control allows for a straight-forward compilation of workflows

forward compilation of workflows via drag & drop. This comes in very handy for complex processing, for example, of workpieces with multiple processing positions within one project (Photo 2). These generated sequences can be used for automated processing as well as for setup sequences.

"The need for softkeys is replaced by a touch screen display control panel. All new machine generations feature this control system."

No data security compromises

Compared to highly automated production centres, it seems like a relic of the early days of industrialisation if operating personnel have to walk from the measurement room to the machine to carry over reports in order to manually type in corrected values. The fact that this is still practised within a high-tech environment is due to the extremely high safety standards of users such as the automotive branch who have so far circumvented simple data integration. Moreover, the use of USB sticks is strictly prohibited. Another factor has been the lack of consistent data transmission standards to allow for secure data integration. That is why Kapp Niles has developed solutions that no longer require the installation of invasive software and thus allows users to retain control over their data at all times. Konstantin Schäfer continues: "This concept does not include any cloud services." Applications that go beyond direct machine control are programmed in HTML5. This allows the user to apply them on both classic computers and mobile end devices.

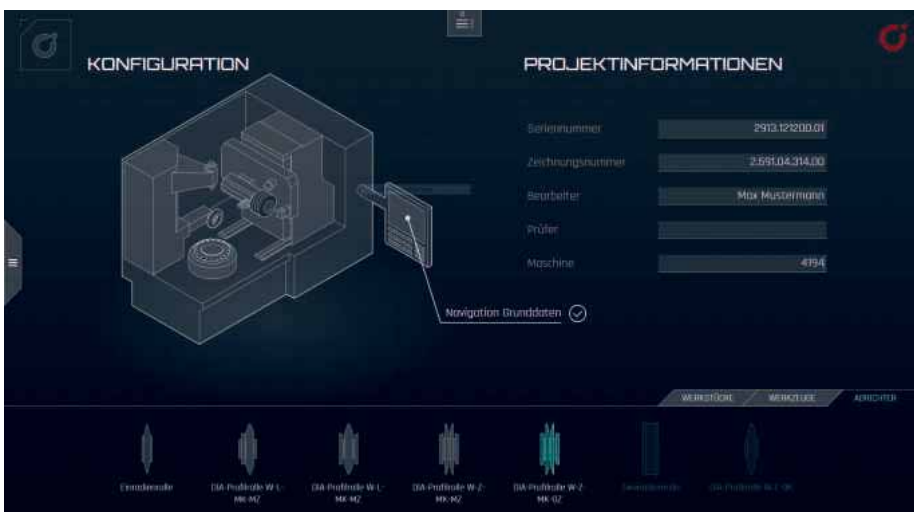


Photo 1: The virtual set-up process facilitates the creation of a new project

KN assist: the bigger picture

Thanks to above mentioned HTML5 programming, KN assist runs without any further software requirements on a PC and mobile end devices alike. All the user has to do is to call up a single address on the Intranet and thus is granted access to the system through his browser or an app.

The data exchange takes place via the standard interface OPC UA (Open Platform Communications Unified Architecture) facilitating machine-to-machine communication with very little effort. As an overview of the overall system array, KN assist uses the open data exchange format such as GDE (Gear Data Exchange) and umati (universal machine tool interface), developed by VDW in cooperation with project partners. This allows the exchange of basic gear/tooth data, modifications, assessments, etc. among manufacturers. Furthermore, the operating states of all machines in the plant are displayed. This gives each user from every location a production overview.

An even more complex application is the data management of all component-specific parts such as clamping, dressing and grinding tools. Until now, setup component data had to be manually entered at the machine to avoid the possibility of supplier data carriers accessing the production areas. In future, RFID or 2D codes will be attached to dressing rolls, worms or clamping tools that can be read by the machines. This reduces setup times considerably and allows components to be clearly identified. Storage locations, service life, clamping cycles or assignments to a project in planning can be conveniently documented this way. In doing so, the response time to service requests and internal processes is reduced.

Quicker response times to service requests

The customer expects prompt service in case of a service request or system malfunction. However, the classic chain of messages is comparatively slow. Machine operators detect an error, notify the Service Department and describe the problem. The Service Department then contacts the manufacturer; the latter queries additional data i.e. best-case scenario, via a modem to be activated, or more likely over the phone. In doing so, information can get lost or displays can be misread. That is how the first hour is spent: converted into idle time, this creates a costly situation. Moreover, the machine manufacturer will have to collect,

update, and analyse the data first. A conventional data transmission via the internet would be feasible, however, it is considered not secure by most users.

Kapp Niles has taken remedial action for this process. The customer can now initiate the contact in KN grind. The service request is sent to Kapp Niles directly via a TÜV-IT-certified VPN connection. Diagnostic data, log files, etc. of the relevant machine will be provided to the customer upon explicit release, without losing the royalties over the process and the data.

Currently, the response time is around 12 hours. In other time zones without local representation, 24 hours at worst.

During the classic process, random workpiece samples had to be taken from production to be carried to the measuring machine usually located in a different hall. Depending on the workload, the results would usually be available about 15-20 minutes later. Afterwards, the measurement report had to be taken back to the machine to manually type in the corrections. In order to reduce these times, Kapp Niles is drawing on multiple factors. The measuring machines are also designed for product-related applications. They can do without a climate chamber (Photo 3). The individual axes and the workpiece are monitored via sensors for temperature compensation purposes. Air springs absorb vibrations. In doing so, the measurement accuracy meets the highest standards, even in high volume production.

Gerhard Mohr, managing director of Kapp Niles Metrology, lays out the benefits: "The machines can be accessed freely by the operator from three sides, and thus is also suitable for automated loading. Flexible

positionable counterholders are provided for the measurement of wave-shaped parts. In addition, the machines can be converted for a new workpiece in seconds with a quick-change clamping system."

Automation also contributes at least as much to the time savings. The direct connection between the grinding and measuring machines is a "closed loop" within the sector. The measuring machine provides data not only in form of reports but also as GDE dataset. In the first version, these are the typical correction variables ($fH\alpha$, $fH\beta$, tangent length correction /pitch correction) which will change in case of a temperature increase or tool wear. Compared to manual input, these data can be imported and analysed much quicker and with fewer errors via OPC UA in KN grind. If a new measurement result is provided, the operator will be notified and receives correction suggestions.

Christian Graf of Software Development explains: "What happens here is not a pure TARGET/ACTUAL comparison. On the contrary, the operator receives the measured values prepared, which allows him, based on his experience to decide whether and how he will intervene. Based on the project, automated tracking is another option (Photo 4)."



Photo 4: In-process measurements via "closed loop". With the dark green area, drifting setpoint values can be detected and corrected, even during ongoing processes

Overall, the described measures will significantly speed up and simplify the workflow. The user gains a better overview of the production process while taking advantage of the many benefits of the new software platform, even on a multi-vendor basis.

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Photo source: Kapp Niles



Photo 3: Kapp Niles KNM 2X measuring device for production-related applications

Okamoto CNC grinder makes an impact at CoorsTek

Following 12 months of trouble-free operation at the Crewe, England manufacturing facility of CoorsTek, the leading global manufacturer of engineered ceramics, an Okamoto 818 CNC surface and profile grinder has been rapidly integrated as a core part of the company's specialist surface grinding operations.

The machine was one of the first to be supplied by Jones & Shipman Hardinge, Okamoto's sole distributor in the UK. As a long-standing Okamoto and Jones & Shipman user, CoorsTek considered another CNC purchase from the company.

For CoorsTek, the Crewe manufacturing plant produces high precision and complex components such as extreme duty seals for use in sectors like oil and gas, chemical and energy. Various high-quality material properties allow ceramic components to endure the harsh and corrosive environments experienced by producers in these industries, but they also present challenges when machining.

Needing an updated, flexible and reliable surface and profile grinding machine as a replacement for an older unit, CoorsTek engineers had trust in the Okamoto brand with four machines already in operation at the facility.

"In the surface grinding cell, we are precision grinding ceramics typically to tolerances of ± 10 micron on form radii with down to five micron on flat surfaces. It is a complex process with slow feeds and speeds and can take its toll on machines and wheels alike," explains Tristan Weller, production manager at CoorsTek, Crewe. "Inherently it is a time-consuming task so sustained machine integrity and stability are all important."

With a very compact footprint, the Okamoto 818 CNC features a 450 mm x



The Okamoto 818 CNC situated in the surface grinding cell at CoorsTek in Crewe



CoorsTek grinding machine programmer/operator Daniel Jones (left) with production manager Tristan Weller



The CoorsTek operators are familiar with the Okamoto CNC programming procedures

200 mm table area with the machine based on a compact moving saddle design. The ISO type programming menu is delivered through a FANUC CNC control with other key features being automatic lubrication to guides and slideways to optimise reliability and prolong maintenance free operation.

All the core machine castings exhibit high static and dynamic stiffness and are fully damped. Scraped V slideways with low friction turcite coatings are standard.

Harry Hodgson, CoorsTek Crewe plant manager and Tristan Weller production manager, comment: "The Jones & Shipman overall commitment to quality and exceptional after sales technical support, convinced us to invest in Jones & Shipman supplied equipment."

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largest variety of metalcutting turning machines, grinding machines, machining centres, collets, chucks, index fixtures, repair parts, standard and specialty workholding devices, plus other machine tool accessories.

Hardinge's solutions can be found in a broad base of industries including aerospace, agricultural, automotive, construction, consumer products, defence, energy, medical, technology, and transportation.



The Okamoto 818 CNC situated in the surface grinding cell at CoorsTek in Crewe

Headquartered in Berwyn, PA, the company designs, manufactures, and distributes machine tools in over 65 countries across North America, Europe, and Asia. More information about Hardinge can be found at www.hardinge.com

Jones & Shipman Hardinge
Tel: 0116 201 3000
Email sales@jonesshipman.com

BLOHM PROFIMAT XT with tool changer

Originally due to be unveiled at GrindTec, BLOHM presents for the first time a PROFIMAT XT with tool changer. The cost-efficient solution to automatically change grinding wheels is one-of-a-kind in this market segment.

The highly productive, flexible PROFIMAT XT merges four grinding technologies in one machine: reciprocate, creep feed, CD and speed stroke grinding. Thanks to the tool changer these procedures can now be automated.



PROFIMAT XT tool changer

In this process, the changer offers users other benefits: it can be loaded with several tools of the same type to be able to quickly and automatically replace worn grinding wheels. The tool changer also makes unsupervised processing possible, even of complex workpieces requiring grinding wheels with different profiles. Setup times are additionally cut as the unit can be loaded while the process is on-going. The tool changer also improves general machine handling because it is easier for workers to load the changer with large grinding wheels than directly fit these in the machine themselves.

Users also benefit from significantly more efficient machining. For instance, roughing or finishing grinding wheels can be prepared in the changer to thus achieve a high abrasion performance and an accurate level of detailed surface machining as part of a single process.

Benefits include: automated production; more efficient machining; automatic operation of complex workpieces; option to load sister tools; setup while process is



Loading device

on-going; simplified handling; key tool changer data; magazine with four grinding wheels; maximum grinding wheel diameter 400 mm; maximum grinding wheel weight 40 kg; maximum grinding wheel width 160 mm.

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FT Gearing counts on Studer grinders with 16 machines installed

Quality has been described as an on-going process of building and sustaining relationships by assessing, anticipating and fulfilling stated and or implied needs. Never has this definition been more appropriate than when applied to Aldershot based FT Gearing Systems Ltd. In addition to establishing long-term relationships with its customers, the leading manufacturer of gear technology and high-precision components also enjoys enduring associations with a small number of carefully chosen machine tool suppliers.

Since the company's inception in 1978, to ensure the efficiency and premium quality of its output and to further expand its range of proficiencies, the business has pursued a policy of regularly investing in the best available manufacturing technologies. This prudent strategy has helped FT Gearing to earn an excellent international reputation and enabled it to broaden its customer base. In addition to its principle, global aerospace and defence industry customer base, FT Gearing now serves an increasing variety of businesses across several equally challenging, diverse industrial sectors.

When involved in the production of premium quality gear technology and high precision components, two of the most important technical prerequisites are, the



ability to achieve demanding dimensional tolerances and to impart the required surface finish characteristics to workpieces. To ensure that FT Gearing Systems consistently delivers in each of these challenging areas, and to maintain maximum levels of efficiency, the company has developed close relationships with the Swiss grinding machine manufacturer Fritz

Studer and the company's UK agent, Advanced Grinding Supplies Ltd.

Over several years, FT Gearing Systems' continuous expansion has led to regular additional investments in the Swiss machines, resulting in the company now operating 16 Studer CNC grinders, the largest collection of Studer grinders owned by a single UK company.

To further improve production efficiencies, the business has established five satellite production units that are co-located to its Impressive HQ. Each facility is dedicated to a separate manufacturing function. FT Gearing Systems' most recently opened production unit specialises in high-precision grinding. The advanced, temperature-controlled facility houses the company's 16 Studer CNC grinders.

Explaining the company's loyalty to the Studer brand and the reasons for the new Grinding facility, FT Gearing Systems' managing director Graham Fitzgerald says: "In addition to other challenging customers, we manufacture and supply both domestic and overseas defence and aerospace companies with a wide range of safety critical components, such as gears, miniature gearboxes, fuel pumps, engine controls, wing surface actuators and instrumentation.



"Given the sectors we deal with, quality is in the very DNA of FT Gearing Systems and permeates every aspect of our work. A major part of our quality philosophy is to provide our highly skilled staff with the best available machine tools and to maintain close relationships with our machine tools suppliers.

"A perfect example of our use of premium quality production aids are our range of advanced Studer CNC grinders. These technically superior machines are able to consistently deliver levels of accuracy and repeatability that conventional grinding machines are unable to achieve. For instance, through the use of Studer technology, we are able to accomplish sub-micron total cylindricity results on 35 mm diameter gear journals, we can also achieve 0.08 µm levels of surface finish and gear flatness to three light bands.

"To enable grinding to sub-micron dimensional tolerances we recently installed our Studer CNC machines in a new, temperature-controlled grinding facility. To guarantee the highest possible levels of quality and productivity, we also use the best available grinding consumables and accessories. Therefore, as well as purchasing

our Studer grinders from Advanced Grinding Supplies, we also rely on the company for items such as diamond dressing tools, precision centres, abrasives / grinding wheels, coolant filter media and air filtration systems.

"Our Studer CNC grinders provide excellent levels of precision, surface finish and reliability. They also deliver outstanding levels of production. Even though we have always been delighted with the performance of our Studer machines, mindful of the possibility of technical developments made by other manufacturers, in the past we have considered other brands. Although, each time we have been able to specify a Studer grinder that perfectly meets our needs and that outperforms the alternatives."

Fritz Studer AG was established in 1912. Now an acknowledged leader in its chosen sector, the company manufactures premium quality grinding machines for the internal and external cylindrical grinding of small and medium sized workpieces. Studer's core strength lies in the production of machines for the efficient grinding of single, small and medium sized production runs.

Peter Harding of Advanced Grinding

Supplies concludes: "As the exclusive sales agent for Studer Grinding Machines in the South of England and in South Wales, we have established a strong working relationship with FT Gearing. In cooperation with FT Gearing Systems' managing director Graham Fitzgerald, I have been pleased to assist in specifying each new Studer machine so that it exactly meets FT Gearings demanding needs.

"In addition to the staff of Advanced Grinding Supplies being available to offer technical assistance to FT Gearing Systems, we also provide the business with a full range of additional equipment. These consumables, including tooling, help the company to maximise the performance its Studer grinders."

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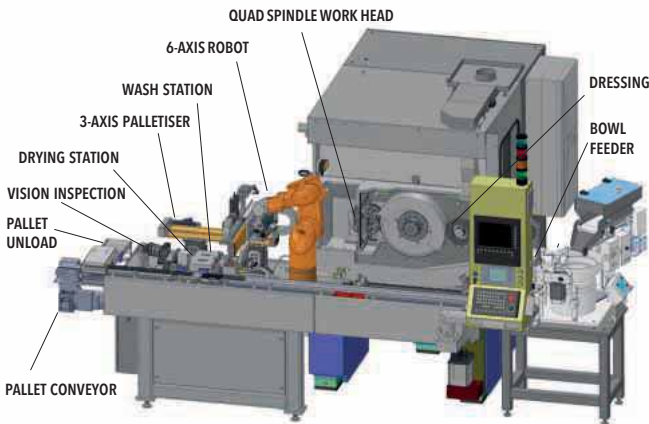
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CMT's Vector Quad doubles carbide tool production

Curtis Machine Tools (CMT) continues to lead the way when it comes to maximising high volume and high precision grinding with the Vector Quad. CMT is one of the leading European manufacturers of grinding machines for small, high-precision components, such as diesel injectors and turbochargers and cutting tools.



robot for loading into the Quad spindle workhead. The workhead then indexes through 180 degrees to take the parts into the grinding zone which is within the fully enclosed wheel guard. The profile is then ground on the part using a peel grinding process. Unlike conventional machines, the Quad grinds two parts at a time: one above and one below the centre line of the grinding wheel spindle, thus giving double the output.



Robot loading / unloading

Peel grinding two parts simultaneously



The Vector Quad Cell giving optimised autonomous production for peel grinding carbide tool blanks

As pictured above, CMT has developed a complete turnkey production system incorporating the Vector Quad for profile peel grinding of K10 grade Carbide tool blanks. This system is the second to have been supplied to a leading manufacturer of carbide parts.

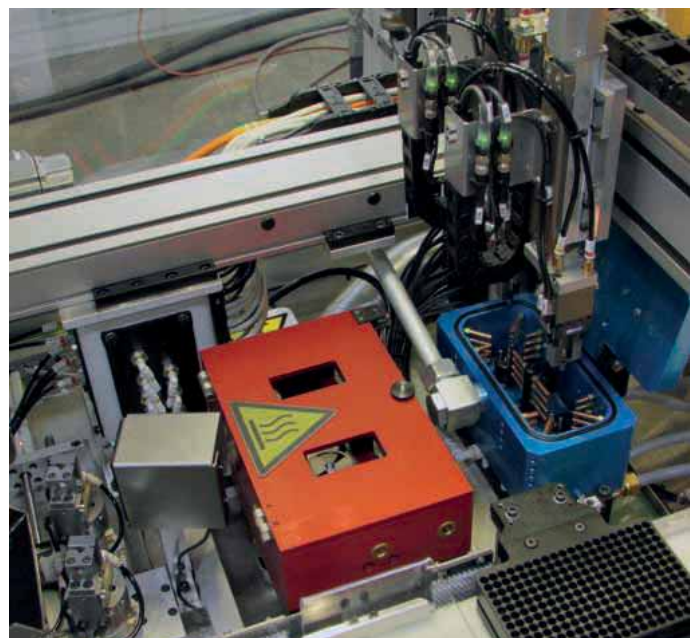
This system has been specifically designed to give 24-hour autonomy in a lights-out production environment. Central to this is the Vector Quad.

The blank parts are bulk fed from an intelligent vibratory bowl feeder. This is capable of verifying that the correct part type is being fed, with incorrect parts being rejected accordingly without the need to stop the process. This feeding system guides the parts two at a time into a shuttle system that in turn transfers the parts to the

After the parts are finish-ground, the workhead indexes back to the load position and the parts are exchanged by the robot. Similarly, the two spindles that have already had their parts exchanged are indexed back into the grinding position, giving a very short spark-to-spark time.

The unloaded parts are then placed by the robot into a wash station and an aqueous wash solution is used to clean the parts for a user defined duration, after which an air blast finishes the process to ensure the removal of as many water droplets as possible.

Following this, a Cartesian loading system takes over the



From left to right: the camera inspection station, drying station and wash station. In the front-right corner: pallet loading

parts-handling to ensure there is no part cross-contamination, it then unloads the parts from the wash station and transfer them into a drying station where they are dried using hot air, this is to prevent staining and also to ensure that the part is ready for inspection.

The Cartesian loading system then transfers the part to the inspection station, where a 21M pixel camera, complete with a telecentric lens and back light assembly, enables the parts to be individually inspected for length, diameter, profile and runout. The measurements collected by the camera system are then collated and used to give closed loop feedback to the machine and keep the process capability within the desired limits.

Following the camera inspection, parts that meet the stringent inspection criteria are then offloaded back to a pallet. When this pallet is full, it is conveyed away from the cell for packing and onward shipment to the end user.

Telemetric system has been fitted to the machine to enable remote control and process monitoring for both operational and maintenance purposes.

The concept of the Vector Quad is based on the long-established Vector Twin. However, unlike the twin, the Quad has an indexing workhead with four spindles, enabling the outer diameters or contours to be ground simultaneously on two workpieces using the same grinding wheel. Conventional plunge grinding is equally possible, as is peel grinding. For the standard offering, the workpieces can be held in either collets or chucks. Equally, more dedicated workholding is also available to meet customers' exacting requirements. Whilst two parts are being ground, either the standard loading system or a robot loads the two other spindles with the next two workpieces.



Curtis Machine Tools is part of the Precision Grinding Technologies Group which has been founded to offer innovative engineered grinding solutions with integrated automation and process technology, by using either the patented Vector grinding technology or by working with one of our precision grinding partners via sister company TECNO.team UK, that offers standard grinding solutions from AMADA, ROSA, SHIGIYA and TOYODA. Engineered grinding solutions are on offer, which give the customer a full turnkey solution from one supplier.

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FUCHS set to launch new cutting and grinding fluid

When it comes to improving tool life and performance, there are few things more important than lubrication. Using specialist high-performance lubricants and using them properly has been proven to increase tool life by up to one-and-a-half times. Multiplied over many expensive tools, that can add up to a significant operational saving.

FUCHS Lubricants' water-miscible cooling lubricants in the ECOCOOL range are exceptionally durable and economical in terms of consumption. Thanks to their excellent lubricating properties, they achieve extremely high machining and cutting performance.

FUCHS is now set to unveil a new member of the product family, ECOCOOL GLOBAL 20, a globally approved water miscible cutting and grinding fluid for automotive component manufacturers.

Alex Holmes, UK Industrial product manager, says: "Customers have reported up to a 43 percent reduction in tooling costs when using the latest ECOCOOL 'Global' platform with existing tooling. Greater savings can be realised when tools are

optimised for the process. In other studies, tool life increases of up to 150 percent have been recorded.

"In the FUCHS UK R&D laboratory, cutting speeds have been increased to provide real benefits in productivity whilst maintaining excellent tool life. The rate of metal removal can also be increased. Results have indicated a 16 percent increase in cutting speed is possible.

FUCHS also offers quality monitoring services thanks to the introduction of its innovative Fluids Live system. Already utilised by more than 100 companies globally, many of which are based in the UK, FLUIDS LIVE is an easy to navigate web-based recording, tracking and reporting tool with integrated KPI measurements.

In short, the system can be the key to unlocking a successful maintenance strategy, with real time data providing immediate and remote access to data showcasing the current condition of fluids in use. Within two hours of the collection of data under Fluids Live, information can be



updated and production professionals able to make informed decisions on maintenance scheduling, production planning and other operational activities.

Alex Holmes adds: "The whole idea is to obtain information from measurements such as oil sampling and vibration monitoring and to ensure asset care is being maximised. It's all designed to cater for increasing skill shortages and to take the guess work away, resulting in a hugely significant saving for manufacturers.

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3M's Silver service

The 3M Silver Depressed Center Grinding Wheel is a type 27 wheel designed to deliver an unbeatable combination of performance and value. This long-lasting wheel uses 3M Precision-Shaped Grains to deliver a fast and consistent cut during grinding and heavy stock removal on stainless steel, mild steel, aerospace alloys and more.

For weld grinding on carbon steel, one customer reports that 3M Silver DCGW delivered 95 percent less wear and a 28 percent faster cut than its current aluminum oxide wheel.

Meanwhile, when removing laser slag from Hardox 960 stainless steel, 3M Silver DCGW lasted twice as long and required less operator pressure than a conventional aluminum oxide wheel.

The 3M Silver Depressed Center Grinding Wheel is a heavy-duty wheel designed for use in aggressive grinding applications like beveling, slag removal, weld grinding and edge work on a variety of metals. You can rely on this wheel to help you to tackle your toughest grinding applications.

In medium and high-pressure applications like robotic weld grinding, it's important to choose a high-performance abrasive that cuts fast and lasts long. The self-fracturing mineral in the 3M Silver Depressed Center Grinding Wheel will keep your robot grinding welds long after other abrasives call it quits, reducing downtime and maximising efficiency.

The 3M Silver Depressed Center Grinding Wheel features 3M Precision-Shaped Grain which continually fractures into super-sharp points and edges that slice cleanly through metal, rather than gouging or plowing as

traditional abrasives do. This also helps it to last significantly longer than conventional ceramic grain abrasives while maintaining a high cut-rate over the life of the wheel.

Advanced Series abrasives

The 3M Silver Depressed Center Grinding Wheel is part of a new class of 3M abrasives designed to deliver an unbeatable combination of performance and value. Powered by the legendary speed and long life of 3M Precision-Shaped Grain, these Advanced Series Abrasives are ideal for a wide variety of metalworking applications like weld removal, beveling, edge chamfering and more, offering a longer life and faster cut than aluminum oxide, alumina zirconia and other conventional ceramic abrasives.

The 3M Silver Cut-Off Wheel is designed to deliver an unbeatable combination of performance and value in metal cutting applications. This long-lasting wheel uses 3M Precision-Shaped Grains to deliver a fast and consistent cut through pipes, tubes or flat sheets of stainless steel, mild steel, aerospace alloys and more.

When cutting steel and stainless-steel tubing assemblies, customers reported 50 percent less wear with 3M Silver Cut-off Wheels compared to their standard aluminum oxide wheel.

For cutting structural metal sheet and plate, 3M Silver Cut-off Wheels demonstrated 40 percent less wear than customer's usual AZ wheel.

The 3M Silver Cut-Off Wheel is designed



to quickly cut through metal pipes, tubes and flat sheets. This may include use in multiple production Cut-off wheels are used in many industries, such as shipbuilding, rail, general metal fabrication and more. You can rely on this wheel to help you to tackle your toughest metal cutting applications.

The 3M Silver Cut-Off Wheel features 3M Precision-Shaped Grain which continually fractures into super-sharp points and edges that slice cleanly through metal, rather than gouging or plowing as traditional abrasives do. This also helps it to last significantly longer than conventional ceramic grain abrasives while maintaining a high cut-rate over the life of the wheel.

This wheel must be attached to a cut-off wheel tool (sold separately) and should always be used with a wheel guard for safety. The wheel also must have a maximum operating speed greater than or equal to the maximum speed of the power tool used.

The 3M Silver Cut-Off Wheel is part of a new class of 3M abrasives designed to deliver an unbeatable combination of performance and value. Powered by the legendary speed and long life of 3M Precision-Shaped Grain, these new products are ideal for a wide variety of metalworking applications like weld removal, beveling, edge chamfering and more, offering a longer life and faster cut than aluminum oxide, alumina zirconia and other conventional ceramic abrasives.



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www.master-abrasives.co.uk



Your partner for Grinding Solutions

Improved material removal with new hybrid bond family

Time and energy savings in fluting with Mirka's new Cafro HP Hybrid Bond product

Producers of advanced drills and end mills can look forward to better material removal and time savings with Mirka's new HP Hybrid Bond diamond and CBN wheels. After intensive internal product development, the wheels have now been tested by several customers and the tests show good results.

"We can see that our solution allows for depths of cut and material removal capacity that cannot be reached with wheels that use standard resin or hybrid bonds. The new product uses an enhanced kind of bond for the abrasive grains, that combines metal and resin bonding," explains business manager Mårten Eriksson at Mirka.

Shorter production time, lower power use

HP Hybrid Bond requires a good coolant pressure in order to avoid clogging and to reach its full potential. The wheel is particularly suitable for customers that produce medium-sized and big series of drills made of harder metals such as

tungsten carbide. One customer that tested the new wheel could speed up its production 2.5 times, while at the same time lowering the amount of power needed to run the machine.

CNC machines that produce drills are typically run automatically at nighttime.

"In addition to time and money savings, we can offer our customers peace of mind with this new solution. They can count on that the job gets done during the night while they are at home sleeping," says Mårten Eriksson.

The development of the new HP Hybrid Bond wheel started after Mirka in 2017 acquired Cafro, a producer of superabrasives wheels and tools. By combining Cafro's long experience of diamond wheels with Mirka's chemical expertise, the company could come up with the new bond solution.

Finnish family-owned company Mirka Ltd is a world leader in surface finishing technology and offers a broad range of



ground-breaking sanding solutions for the surface finishing and precision industry. Thanks to high quality sanding and polishing products, and innovative power tools with digital services and connectivity, a Mirka solution delivers real benefits to customers in terms of speed, efficiency, surface finish quality and cost effectiveness.

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www.mirka.com/mirka-cafro

DragonFly makes tooth-face grinding more efficient

LACH DIAMANT will present the newly developed diamond grinding wheel at AMB Stuttgart for the tooth-face grinding of diamond grinding wheels, providing supreme process reliability and stability.

LACH DIAMANT's DragonFly grinding wheels show supreme durability, stability and process reliability during continuous operation. This allows for reduced production and regrinding costs, while still providing highest precision.

The unique support system with 3-dimensional geometry and extended grinding layer allows the grinding of even

the narrowest tooth pitch. It is possible to operate with higher speeds and infeeds. This shortens grinding time significantly and increases the cut volume. The results are impressive: exemplary straight surfaces without any deformations.

More information about DragonFly diamond grinding wheels for the face, back and side grinding of carbide studded saws is available at AMB 2020 or from LACH DIAMANT via email to **office@lach-diamant.de**.

Diamond-coated wear parts in series manufacturing

Diamonds, and in particular polycrystalline synthetic diamonds (PCD), have been proven superior to carbide in machining. But why should diamonds as wear protection for tool and grinding machines be only available to a small, pro-active user group?

At AMB in Stuttgart, LACH DIAMANT presents many ways to use diamonds as wear protection and to profit from its superior hardness. Examples include:

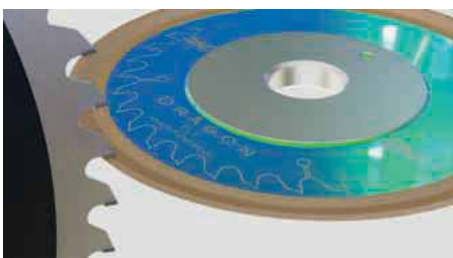
Operating Parameters	
Cooling Lubricant	Oil or synthetic
Workpiece	Carbide studded circular saw
Infeed	a_p = up to 0.3 mm
Infeed Speed	v_f = up to 8 mm/s

Operating parameters for the efficient tooth-face grinding of carbide-studded circular saw blades

centring tips, bezels and prisms as well as bearing shells, templates and guide rulers, and in addition PCD-tipped knives for plastic granulates and diamond-coated guide elements for the paper and printing industries.

Talking to LACH DIAMANT will surely help to identify solutions which comply with your requirement for more cost-efficient production processes and less downtimes.

LACH DIAMANT
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*3055rpm at 200mm diameter

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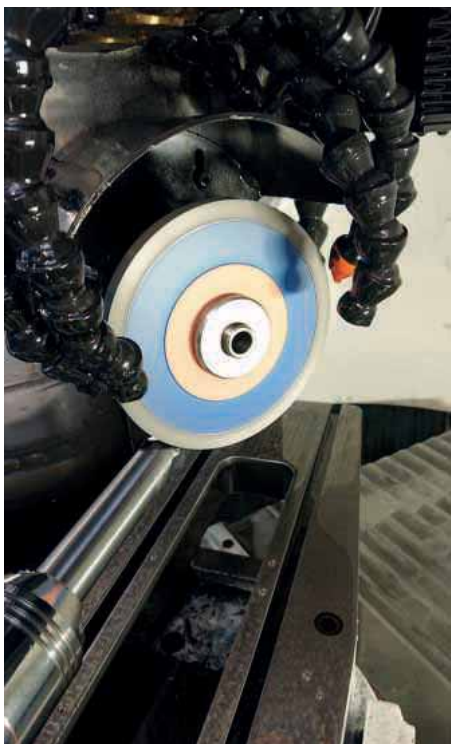
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TYROLIT and Marlor

Established in 1970 by George and Mary Taylor, Marlor is an industry leader in solid carbide cutting tool design and manufacture. The company has redefined its productivity standards through the ongoing development of optimal tooling technologies. With a highly skilled and motivated workforce, Marlor can solve challenges quickly and effectively, while its products and services exemplify the best of British engineering.

The TYROLIT STARTEC product range was introduced to the market in 2009. It was the first 100 percent metal bonded diamond grinding wheel for flute grinding into cutting tools made of solid carbide. Process times could be reduced by 50 percent, while at the same time, profile retention and wheel wear were also reduced. STARTEC XP-P+ and XP-P specifications were refined for mass production, where high feed rates and profile retention were essential requirements.

Changing market requirements lead to the development of the STARTEC RC product. Setting new standards in high performance flute grinding, the new specification has tailored diamond quality and a new bond system. Built together with innovative production processes, this has allowed for a wheel that features impressively low grinding forces and



maximum stock removal rates with little profile wear. STARTEC RC grinding tools guarantee maximum precision for tool production and an optimum surface finish.

STARTEC Cup wheels were also developed for clearance and face end grinding. This product perfectly complements the flute grinding wheel as it is made for perfect cutting-edge quality and minimum edge wear.

TYROLIT'S premium group of products were introduced to Marlor at their inception and over the last decade they have benefited from each stage of the STARTEC development cycle.

Marlor Tooling's works director Martyn Cross, offered a direct and open door response to our interview:

What do you manufacture and in what industries do you serve?

"We work across the engineering sectors of aerospace, automotive, subcon engineering and the power generation industry. We develop industry leading tooling solutions which improve quality, value and service for our entire client base.

"We have the technology and expertise to design and manufacture the highest quality tools which are designed to overcome the challenges of constant material development, capacity constraints, working tolerances and financial pressures. We can to provide a full remanufacturing service which takes tools back to their original geometry at a fraction of the cost of a new tool.

"Our advanced design and development processes can typically allow for multiple remanufacture cycles, helping to maximise cost-effectiveness whilst simultaneously improving the carbon footprint of any given tool. Intelligent tooling is a methodology that not only applies to new products but to those which have completed their initial lifecycle.

"Designing out obsolescence is crucial and our intelligent tooling approach can often allow a tool at the end of its life to be remanufactured for another application, maximising value, reducing waste and extending life."

Why did TYROLIT bring STARTEC RC to you?

"All wheel suppliers make bold statements



about reduced cycle times, longer wheel life, less dressing frequency and improved stock removal. We are looking for these things but see quality, surface finish as being even more important, we want the other benefits but work on short lead times and some small batch work so we also require a comprehensive stock program of wheels that are not a compromise. TYROLIT stock wheels are available on short delivery times with a sufficiently expansive range to suit our needs. For us they have managed to hold UK stock of the STARTEC RC wheels which we prefer.

"We have a highly skilled and motivated work force who understand the need for a quality high performing grinding wheel and we listen to their feedback and make the wheels they prefer available to them. The increased use of the STARTEC RC is because the operators have asked for these wheels as they work better and longer. Competitive cost is important but when we have a requirement for a wheel availability, confidence in the wheel is more important. TYROLIT has a wealth of expertise on the ground in the UK, but we also have full access to specialist teams in Austria if the need arises. That application support and knowledge really is unique in this industry, I think it is a family thing."

How has the TYROLIT STARTEC RC benefited your business?

"We don't measure against shorter lead times or reduced costs as a general rule. What is critical to us is superior quality. Perfection in surface finish and longer times

between dressing are the benefits we seek. Keeping a wheel accurate and in use for longer without adjustment and setup intervention is key. Consistency between wheels is very important. We want a wheel to perform exactly the same as the last wheel used and don't want to adjust programs or get surface finish differences or tolerance holding issues. Extending time between wheel dressing saves us time and money and importantly for us keeps our workforce proud of their outputs.

"We don't buy on price. Of course, we want a competitively priced product, but other than that price doesn't influence our decision. We pay for quality and consistency. Operator confidence is very important."

A key success of Marlor Tooling is its efficiency and total commitment to the quality of its production. Based on these foundations Martyn Cross is keen to make sure that the operators are using tools that they have confidence in.

"The pressure on our workforce is intense and our operators feel that they are personally accountable for their work. The STARTEC wheels are the ones that are

always requested, because the operator knows that they will perform just as they should every time, consistently throughout the lifetime of the wheel."

What change has STARTEC had on your operations?

"Our wheel spend is increasing as we buy more wheels specifically for different tools and work, TYROLIT's range of grit sizes, bonds and wheel shapes allows us to optimise our process's and the finished tool. For example, we are now using wheels optimised specifically for the size of tool we are grinding and the finish and tolerance holding requirement we have.

"New machines we have bought are catered for in the stock wheel program and the wheels we buy for machines such as the Rollomatic NP3+ are recommended by the machine tool supplier and actually come in with the new machine, so we are confident we have the best wheel. TYROLIT is coming in recommended by the original equipment manufacturer so it's a second seal of approval."

TYROLIT is always looking to advance the performance of its products within the



STARTEC programme. The PG-2 peel grinding wheel has evolved from the resolute development work based upon the PG-1 peel grinding wheel. The new strength metal bond and diamond qualities maximise the wheel performance for this process. Marlor has benefited from the PG stock range for their new Rollomatic machine and have seen the performance rewards.

For more information, contact:

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Email: mark.richards@tyrolit.com
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Filtermist's clean air solutions meet health & safety regulations

Filtermist Systems, which opened a brand-new purpose-built distribution centre in Telford last year, is a new enlarged group and promises to deliver a complete solution in one place.

The latest products from Kerstar, Ecogate, FastClip and Dustcheck plus a new Augmented Reality app provide the best way of ensuring workplaces are free from contaminants, including oil mist, dust, smoke, fume and VOCs.

The HSE's current inspection programme aims at targeting 800 fabricating companies in 2020 and Filtermist is confident that it can more than meet the needs of this important sector.

"New guidance has been released about welding fumes, including mild steel, being classed as carcinogens and this, along with minimising exposure to metalworking fluids, needs to be addressed by manufacturers spanning automotive and aerospace to high value engineering and renewables," explains Andy Hives, director of Group UK Sales for Filtermist. "As part of the recently introduced enforcement changes, the HSE is stepping up its number of inspections and firms will need to ensure they've taken the necessary measures to be compliant or face costly fines.

"Products, including Filtermist's newly introduced F Monitor 2, are designed to make it easy for machine operators to spot if their Filtermist oil mist filter needs servicing, helping manufacturers ensure they're continually providing a clean working environment for employees."

Historically, Filtermist is known for manufacturing a range of compact centrifugal oil mist filters, but as the UK distributor for sister companies Absolent AB and Bristol T&G International GmbH, it also offers static filter media filtration systems and electrostatic filters.

Andy Hives continues: "We have provided effective oil mist extraction solution for customers' specific requirements for more than 50 years.

"Our recent acquisitions have now given industry a single-source solution to tap into for a much wider range of contaminants. Whether that is initial advice and LEV testing, right through to supplying the latest

oil mist filtration systems and state-of-the-art wet collectors. Our Systems business can also project manage the entire installation.

"Creating a 'clear air' workshop has so many more benefits than just meeting legislation. It has been proven to improve morale and increase productivity, whilst also reducing staff sickness.

Kerstar swarf vacuum cleaners

The KSV 45/2 C is a portable industrial unit designed to pick up metal chippings and swarf, excluding spirals, from milling machines and lathes for example, where most of the liquid (suds) have drained into a sump. The motor unit is protected from the ingress of metal by a liquid resistant filter assembly, whilst the filter assembly is protected from metal chippings by the cyclonic separator. The cyclonic separator directs the majority of the metal chippings downwards into the swarf basket in the canister, which holds the metal chippings. When the basket is lifted out of the canister any liquid drains out through the perforations in the basket and back into the canister, making it easy to dispose of.



FastClip

High performance clip-fit extraction ductwork and accessories, manufactured in Filtermist Systems' Yorkshire manufacturing facility, are commonly used for transporting dust and fume.

Ecogate

Ecogate technology can reduce the costs of running extraction systems by as much as 75 percent. Sensors monitor when machines are in use and automatic dampers direct airflow where it is needed, minimising unnecessary extraction and significantly reducing energy consumption.



Dustcheck Wet Collectors

Dustcheck's Wet Dust Collectors, also known as wet scrubbers, use water and air pressure to 'scrub' dust from the air. Wet Dust Collectors send the dust through a



water spray then, using gravity, dust is separated from the water and the dust can be removed. Dustcheck's range can be used on metal finishing applications, such as grinding, finishing and fettling, where the materials used could include aluminium, titanium and magnesium for instance, which may present a fire or explosion risk.

Andy Hives concludes: "The industry needs to take more strides towards delivering cleaner factories and production facilities.

"Our turnkey solution gives customers a simple way of accessing the latest technology and the unrivalled expertise of a 250-strong workforce. That's a pretty powerful combination and this is reflected in continuing demand for our offer."

For further information, contact:

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AirBench releases new drop-in downdraught bench

AirBench Ltd has announced the release of AirBench DB, a compact drop-in downdraught bench designed for light duty dust and fume extraction.

The new DB model is designed to be installed into an existing workbench, for applications which do not require a full AirBench solution. As with other AirBench units, only a standard single-phase supply is required. The unit sits in a cut-out and provides an integrated working surface with full extraction.

Controls are integrated within the face of the unit for easy operator access. A range of sizes are available and units can be painted if required to match existing colour schemes.

DB complements the existing AirBench



range of heavy-duty downdraught benches, providing a lighter duty alternative. Suction is provided by integrated, high efficiency EC fans for ease of control and low power consumption.

For more information, contact: visit airbench.com/airbench-db for more information or a demonstration.

AirBench Ltd also announced an upgraded range of AOF Oil Mist Filters. The AOF range is designed for extraction of oil mist and smoke from machining applications. AOF units can be machine-mounted or supplied with separate stands where required.

AOF is designed to use the wind shear principle for initial separation of mist from airstreams. As the contaminant loading on the fan is very low, typically they do not suffer from loss of impeller balance and so can be serviced in-house at relatively long intervals.

Units are supplied as standard with a high-grade final filter with an estimated life of up to 3600 working hours. Usually



available from stock and supplied complete with all parts required for mechanical installation, AirBench can solve most mist extraction issues quickly and simply.

AirBench also supply the OMF range of stand-alone coolant mist filters, which are designed for continuous operation and can be configured to provide a central system supporting multiple machine tools.

AirBench Ltd

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Email: scook@airbench.com

www.airbench.com/mist

Dust extraction specialist launches new range of industrial vacuum cleaners

Dustcontrol UK has officially launched its new and upgraded range of powerful Tromb vacuum cleaners.

The trio of new additions to the Tromb family include the DC Tromb 400 dust extractor, DCF Tromb pre-separator and the combined DC Tromb Twin dust extractor and pre-separator.

The remodeled versions of the Tromb range meet modern safety requirements while offering ergonomic and modular functions. One of the major updates is that the new DC Tromb Twin model is separable, meaning the dust extractor and pre-separator are easily detached and re-assembled from each other to make transport simple.

Other updates to the new range include a simpler filter change system and a motor package that is easier to remove. In addition, improved motors and a sturdier chassis has seen the Tromb family go through a significant expansion and upgrade.

James Miller, managing director of Dustcontrol UK, says: "We're excited to

announce the launch of our new and improved Tromb range. The DC Tromb is our most powerful single-phase dust extractor, being designed to cope with both the demands for a clean and healthy working environment and handheld power tools, from which they can be connected.

"The new range is not just powerful, robust and effective but also versatile and can handle all kinds of fine dusts and materials on a construction site, created from cutting concrete, sanding, grinding or drilling floors or walls, as well as dust from many other industrial factory processes."

The company, based in Milton Keynes, has over 45 years of experience in developing dust extraction solutions and centralised vacuum systems to fit client requirements in the aerospace, food and drink, construction, engineering, and manufacturing industries. It is an expert in capturing dust at its source, both where and when it is created.



James Miller adds: "The Tromb is equipped with a patented self-cleaning filter and a HEPA 13 filter built to be Application Class H. Ultimately, the new range ensures those working in industries where hazardous dust is prevalent, will be able to carry out their jobs in a safe and healthy environment."

For further information, contact:

Dustcontrol UK

Tel: 01327 858001

Email sales@dustcontroluk.co.uk

www.dustcontrol.co.uk

Expansion of filtration systems for coolants

Budget-friendly, efficient and sustainable LTA coolant filters for oil and emulsion mist are low-maintenance and budget-friendly for industry and trade. These filtration systems efficiently and sustainably provide clean air in production plants.

LTA mechanical systems increased its product range with the addition of M 60-CMP, M 150-CMP, M 250-CMP, and M 400-CMP with 230V or 400V options. The new systems with pre- and main filters offer extraction capacity from 600 to 4,000 m³/h for both oil and emulsion applications. Using inertial separation, the prefilter removes solid, aerosol, and coarse particles from the air. The main filter then captures emulsion or oil aerosols. Clean air exits the air filter blower via the post-filter.

The filtration systems impress with their modular design adaptable to any industrial application's requirements. Fast and simple replacement of the filter inserts also ensures low-cost servicing.



Flow-optimised air filters increase process reliability while minimising downtimes. The coolant filters have a routinely high collection efficiency while reducing energy costs and permanently increasing operational reliability.

A separate control cabinet and a post filter box with HEPA cartridge enable continuous monitoring of exhaust emissions. The main filter element with coalescing cartridges separates either oil or emulsion. With standardised filtration systems and

numerous custom solutions, LTA Lufttechnik GmbH has the ideal concept for any ambient condition. Whether in large or small scale production, all LTA systems adapt flexibly to a wide range of applications.

Erwin Junker Maschinenfabrik GmbH
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Email: info@junker.de
www.junker-group.de

Smart electronics need smarter fume extraction

As global demand for Printed Circuit Boards (PCBs) accelerates, thanks to greater automation in industry and the miniaturisation of devices, electronics companies are being reminded about the workplace health risks associated with certain production processes.

The manufacture and assembly of PCBs can result in harmful emissions being released into the working environment, so BOFA International, a global leader in portable fume extraction technology, is urging businesses to check that their extraction systems remain fit for purpose during this period of rapid growth.

"According to a recent analysis, the global PCB market is predicted to reach around \$80 billion by 2024," says David Thompson, business development manager at BOFA. "This presents significant opportunities for companies but can also put pressure on production capacity.

"So, when businesses are planning for growth, we would advise them to ensure that their existing fume extraction systems are maintained in optimal condition and that any new investment in manufacturing includes the latest technology to remove

airborne contaminants. In this way, extraction technology will help workplace environments stay safe for employees while contributing to achieving productivity goals."

While the health risks associated with manual and automated soldering are widely understood, there are other processes in PCB manufacture and assembly that can also be a cause of concern.

For example, the batch marking by laser of PCB boards is key in traceability for the electronics sector, but the emissions resulting from lasering can include solid particles, liquid droplets or vapours/gases, and can be particularly hazardous to respiratory function, depending on the substrate and laser parameters.

Another example is conformal coating, which protects PCBs from ingress of dust and moisture. This process is likely to involve organic chemicals, e.g. cyclohexane, xylene, etc., which will give off hazardous fume and mist, but which can be properly controlled by BOFA filtration technology. Many businesses apply coatings by means of aerosol sprays which use a propane/butane propellant, which aren't particularly harmful,



but can mask the smell of more harmful chemicals.

David Thompson continues: "BOFA solutions combat all these risks through multi-stage filtration technology that includes specialist activated carbon filters designed to capture specific chemical emissions.

"HEPA filters ensure a particulate filter efficiency of 99.997% is achieved, contributing to compliant health protection while helping deliver the productivity gains that come from fume and dust free process lines."

For further information, go to www.bofainternational.com/en/your-industry/electronics/

BOFA International Ltd
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Email: info@bofa.co.uk
www.bofainternational.com

Extraction technology pioneer increases turnover by 11.5 percent

KEMPER GmbH has closed the business year 2019 with a record result. Turnover increased by about 11.5 percent compared to the previous year. The manufacturer of extraction units and filter systems thus once again exceeded the previous sales record from 2018. Growth was particularly driven by the markets in Southern Europe, Great Britain and after-sales service. KEMPER has already set the structural course for further growth and is looking positively at the development in the coming years. In the course of a personnel increase in all business areas, the number of employees in 2019 will rise by 13 percent to more than 400.

"In the past fiscal year, we once again significantly strengthened our international market position," says CEO Björn Kemper. "The demand for effective occupational safety in metalworking continues to grow and KEMPER is responding to the increasing demand with smart solutions."

One of the success factors is the strong European business. In the UK, the manufacturer has been benefiting from stricter health and safety regulations since February 2019, which is fuelling demand for welding fume extraction systems. This is due to the reclassification of welding fumes by the Health and Safety Executive (HSE). It no longer only classifies hazardous substances as carcinogenic when welding stainless steel, but also when welding mild steel. KEMPER has the world's most comprehensive portfolio of extraction systems for protection against carcinogenic welding fumes.

Last year, the manufacturer founded a subsidiary in Russia, repositioned its OEM business and strengthened all business areas with new personnel. Sales also increased significantly in the services segment, thanks in particular to the restructured after-sales services. Frederic Lanz, a proven welding technology expert and industry insider joined the KEMPER management team, that has been actively shaping the development of the company since January 2019.

"The course is set for further growth in the coming years, both structurally and in terms of personnel," says Frederic Lanz, managing director marketing and sales at KEMPER. "Our solutions offer significant added value beyond pure extraction." This is exemplified by the new KEMPER beats extraction hood with integrated Bluetooth speaker.

"Discussions with our customers show quite clearly that clean factory buildings and a high level of occupational safety are an absolute must," adds Frederic Lanz.


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

KEMPER was founded in 1977 and has approximately 400 employees today. The management consists of Björn Kemper, Michael Schiller and Frederic Lanz. As well as headquarters in Vreden, Germany, the company also has a production site near




Prague in the Czech Republic. It is represented worldwide by eight subsidiaries and numerous regular trading partners.

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Anodising aluminum cylinders

An economical approach to resolving surface finishing challenges

Flexible hones address surface roughness and increased dimensional changes for anodised cylinders that mate with other parts.

To permit the use of aluminum instead of other, heavier metals in industrial applications, many cylinders are anodised to create an extremely hard surface that is wear-resistant, corrosion resistant, non-conductive and lubricious. As anodised surfaces are porous, they improve adhesion of coatings as well as accept a variety of dyes for colouring.

Given the myriad of benefits, anodising is popular for a variety of cylindrical items, including lift mechanisms for chairs, lift cylinders for hatchbacks, shock absorbers and forks for bicycles, fuel pumps, water pumps, pneumatic and hydraulic cylinders, spool valves, valve stems and valve bodies.

However, the anodising process means the parts grow dimensionally and increase in surface roughness. For a cylinder, that includes both an increase to the outer diameter (OD) and decreases to the inner diameter (ID). There are several different types of anodising methods and each type or class reflects a range of coating thicknesses. As a rule, thicker coatings provide greater corrosion protection and, in harsh environments like salt air, this means longer-lasting surfaces.

As for surface finish, generally a hard coat that is anodised to a .002 thickness will result in a Ra that is two to three times the original bare metal finish. For example, a machined Ra of 16 can easily become 30 Ra or more after anodising.



For many parts, this is not an issue. However, when the part is cylindrical and mates with another part, often using a seal, increased dimensions and rougher surface finish can be problematic.

Anodic coatings are very hard (only slightly less than diamond and harder than hard chrome plating) and increased surface roughness can abrade sealing materials. Seal wear and coating irregularities can provide a path for leaks.

For this reason, parts require a fine surface finish for reliable sealing and long

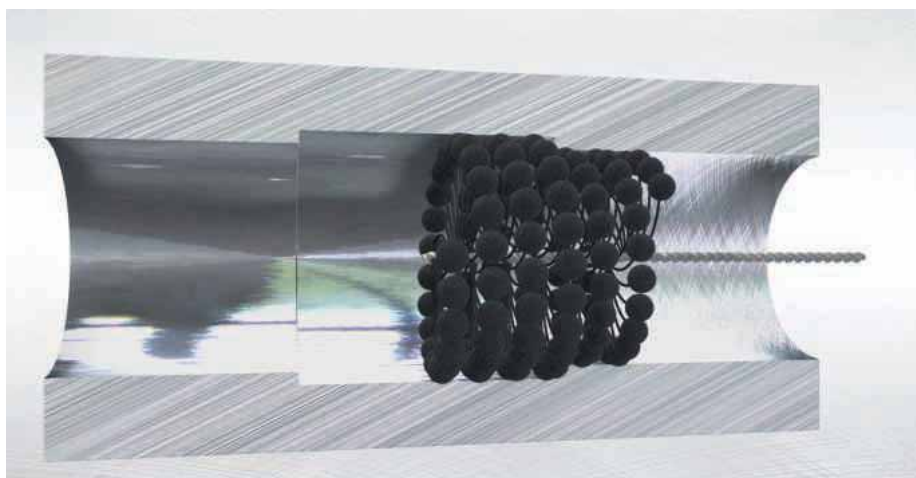
component life. To accomplish this, many are utilising honing tools as an economical approach to treating the surface before or after the electrochemical process to control the dimensions and create a smoother surface. The result is a cost-effective approach to resolving finishing challenges in the anodising process to consistently yield high-quality products at a competitive price.

Honing tools

Traditionally, manufacturers have used grinding, lapping, and rigid honing to improve the surface finish of anodised and hard-coat anodised parts. Machine setups are difficult, however, and they must be extremely precise. There are several reasons for this. Firstly, the anodised coating is very hard and secondly, the total coating thickness is very thin. Thirdly, the high points and low points of the anodised coating are not absolutely symmetrical around the centreline of the cylinder ID.

When rigid honing is used with anodised parts, the honing stones only contact the coating's high points. In other words, parts of the cylinder ID remain untouched.

There are other issues with rigid honing, too. As anodised coatings are relatively thin,



only a very small amount of material should be removed. Yet rigid honing works best with heavier cuts and greater material removal. Fine cuts combined with tool loading can contribute to smeared surfaces.

The Flex-Hone Tool from Brush Research Manufacturing provides a better way to improve the surface finish of anodised and hard-coated cylinders.

With its unique construction, the Flex-Hone® is comprised of abrasive globules that are permanently laminated onto the ends of flexible nylon filaments. As the diameter of the tool is greater than diameter of the bore, the Flex-Hone is used in an oversized condition and is self-centring, self-aligning, and self-compensating for wear.

Importantly, the Flex-Hone tool's abrasive globules "float" to ensure that all parts of the bore and not just the high spots are surface finished. Unlike rigid honing machines, Flex-Hone setups are simple, too. Surface finishes can be improved with just a few strokes of the tool and the results are consistent.

The Flex-Hone Tools can be used prior to

anodising to control the size in anticipation of the shrinkage in ID. Honing also removes "fuzz", sharp edges and any amorphous material that might adhere to the surface and affect the quality of the anodizing.

The most common usage for the honing tool, however, is after anodising to correct unanticipated size and surface finish issues. When the quality of the final anodised finish is of the utmost importance, some even use the tool before and after.

With anodised coatings, the recommended abrasive types are aluminum oxide (400, 600, or 800 grits) and levigated alumina (extra fine only). Choice of grit depends on the type and thickness of the anodized coating and the final surface-finish specification. Flexible honing tools are available in sizes ranging from 4 mm to 36 inches.

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

BRM was one of the first companies to advocate the critical need for finer surface finishes to optimise performance. Concepts

such as plateau finishing were pioneered by founder, Steve Rands and are now commonplace goals across many industries.

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

All of the tools BRM manufactures are still made in the USA. With over 150 employees in Los Angeles, it provides products for hundreds of distributors across the country. Flex-Hone and industrial brushes are exported to over 50 countries around the world.

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Nagel reduces idle time for crankshaft superfinishing machines

Faster cycles for crankshafts

The lower the bearing friction in a piston engine, the higher its efficiency. All things considered, this also means lower fuel consumption and CO₂ emissions respectively. The focus is on the crankshaft, among other things. Superfinishing the bearings of these key components is already a standard process today. Nagel has optimised the interplay of the process steps necessary for this on finishing machines of the UF series. This reduces the cycle times considerably.

Crankshafts for combustion engines are manufactured in large quantities. All manufacturing processes, whether forming, rough or fine machining, are subject to high demands when it comes to productivity. During the course of the launch of the dFlex finishing tools, the focus was on optimisation of the machining time. As a result, the machines of the UF series from Nagel finish a standard crankshaft within around 20 seconds. This is already an excellent value. The idle times, caused by clamping, adjustment or traversing processes, sometimes take twice as much time. This applies above all when a machine concept enables complete machining. This is the case for machines from the Nürtingen-based finishing experts.



Marcel Bosch, manager of process development and service at Nagel Maschinen- und Werkzeugfabrik GmbH, Nürtingen: it was possible to reduce the idle times of the UF series superfinishing machines by 30 percent, making it possible to model a 2000 unit platform

Aside from the main and connecting rod bearings, shaft seats and flange bearings can be finished and oil holes also deburred. Consequently, the bigger set screws are in the idle time range in order to further

improve productivity. "We scrutinised all the processes on our UF series machines and developed a new control concept," reports Marcel Bosch, manager of process development and service at Nagel. In detail: Subsequent processes can now already be started when the finishing arms open from the interference contour of the crank shaft. Improved positioning windows of the NC axes result in a faster programme run.

Parallelisation of the clamping processes of the tailstock and headstock also save valuable seconds. If the traverse path is in a given tolerance window, then the axis is immediately accelerated to its maximum value. Last but not least, more precise control of the NC drives boosts the dynamics.

"Thanks to these measures, we have been able to reduce idle times by 30 percent," summarises Marcel Bosch. You can also look at it from the other side: if the quality requirements of the car manufacturers increase and a longer finishing time is necessary, this is compensated for by the shortened idle times so that the original cycle times are maintained. All things



The current dFlex finishing tools ensure minimised machining times and high process reliability on the superfinishing machines from Nagel

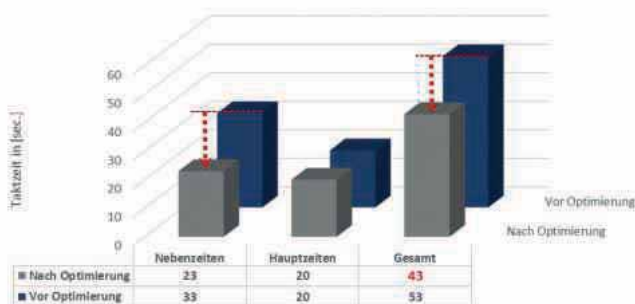
considered, a crankshaft with the current quality requirements only remains in the machine for 43 seconds. Marcel Bosch continues: "In light of the usual cycle times in the automotive industry, a 2000 unit platform, i.e. 2,000 crankshafts per day, can be modelled by a single machine tool. The achievable Rz values are 0.5 µm, taking pre-machining that is typical for the series into consideration. In combination with the 2nd generation of our dFlex finishing tools, material removal of 8 µm on the diameter is possible."

It is important that the aspects of quality and process reliability remain untouched by the optimisations and are at the usual level. This is shown by the results for connecting rod bearings, for example. They are the actual challenge when finishing crankshafts, because they rotate eccentrically around the shaft axis. The finishing arms must follow the bearings. This generally results in different acceleration forces that counteract the clamping forces of the finishing tools. In the worst case, this results in different surface qualities over the perimeter of the bearings.

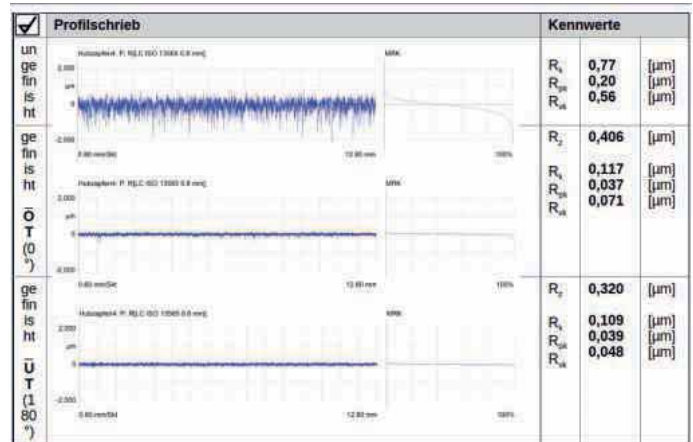
"We have designed our finishing arms and tools for maximum process reliability, so that these effects have no impact. Roughness differences on the perimeter of the bearing (OT/UT) do not occur. The quality is always constantly high, even with increasing demands," emphasises Marcel Bosch.



Often used for machining crankshafts: the UF10 plunge-cut superfine finishing machine from Nagel. The machines allow complete machining, which means oil seal bearings, journal bearings and flange bearings are finished in addition to the main and connecting rod bearing



By reducing idle times by 30 percent for superfine finishing crankshafts, all things considered, the cycle times are reduced by around 10 seconds to 43 seconds. To the automotive industry, this means a 2000 unit platform with a daily capacity of 2,000 workpieces becomes possible on one machine



Superfinishing pays off. Roughness profiles of a connecting rod bearing before (top) and after machining on a current UF series superfine finishing machine with dFlex tools from Nagel. The two profile logs of the OT and UT measurement positions (middle, bottom) prove that even with the highest surface requirements, a homogenous surface quality results on the entire perimeter of the bearing

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Kennedy assassination bullets preserved in digital form

NIST scientists use advanced imaging techniques to create digital replicas of these important historical artifacts

In the palm of his hand, Thomas Brian Renegar held two small metal objects that had changed the course of history. Twisted pieces of copper and lead, they were fragments of the bullet that ended the life of President John F. Kennedy on Nov. 22, 1963.

A physical scientist at the National Institute of Standards and Technology (NIST), he was not yet born when the nation was robbed of the young, charismatic leader who fought for civil rights and set America on a course for the Moon, but he felt the weight of history. He picked up one of the fragments using rubber-tipped forceps and, with the care of a jeweller setting a stone, placed it into a housing beneath the lens of a 3D surface scanning microscope.

These artifacts are usually held at the National Archives. They were transported to NIST so that Thomas Brian Renegar and the rest of the NIST ballistics team could scan them and produce digital replicas that are true down to the microscopic details.

Viewing the digital replicas on his computer screen, he said: "It's like they're right there in front of you." The National



NIST physical scientist Mike Stocker places the bullet, wrapped in a silicone sleeve, on the microscope for a new run

Archives plans to make the data available in its online catalogue in early 2020.

Why do this, so many years after President Kennedy's tragic death? The mission of the National Archives is to provide the public

with access to artifacts such as these and it receives many requests for access to them. This project will allow the Archives to release the 3D replicas to the public while the originals remain safely preserved in their temperature and humidity-controlled vault.

"The virtual artifacts are as close as possible to the real things," said Martha Murphy, deputy director of government information services at the National Archives. "In some respects, they are better than the originals in that you can zoom in to see microscopic details."

In addition to the two fragments from the bullet that fatally wounded the president, the digital collection includes another bullet that struck both the president and Texas Governor John Connally. This one is known as the "stretcher bullet" because it was found lying near Connally at the hospital. The collection also includes two bullets produced by test firing the assassin's rifle and a bullet that was recovered following an earlier, failed assassination attempt on Army Major General Edwin Walker that was thought to involve the same firearm.

In the lab, the NIST ballistics team used a



Credit: NIST



Credit: NIST



Credit: NIST



Credit: NIST

Clockwise from top left: the stretcher bullet (CE 399 FBI C1); a fragment of the bullet that fatally wounded the president (CE 567 FBI C2); a second fragment of that bullet (CE 569 FBI C3); a different perspective of that same fragment. The exhibit numbers were assigned by the Warren Commission (beginning with "CE") and the Federal Bureau of Investigation

technique called focus variation microscopy to image the artifacts. At each location along the object's surface, the microscope created a series of images at different focal distances. By analysing which parts of those images were in focus, the microscope measured the distance to the object's surface features. As the lens moved across the object, it built a 3D surface map of the microscopic landscape beneath it, like a satellite mapping a mountain range.

Thomas Brian Renegar and NIST physical scientist Mike Stocker spent countless hours rotating the metal fragments beneath the lens of the microscope to image every facet, then stitching the image segments together where they overlapped. "It was like solving a super complicated 3D puzzle," said Thomas Brian Renegar. "I've stared at them so much I can draw them from memory."

If you held one of the original fragments in the palm of your hand, you would see that the metal is warped and twisted into a complex shape, but magnified on the computer screen, it is a world unto itself: a highly complex and undulating terrain that bends, dips and doubles back. Zoom in, and you can see rifling grooves left by the barrel of the gun. Zoom in closer, and you can see the microtopography: ridges and scratches that would be far too fine to feel with your fingertip.

The focus variation scans had a horizontal resolution of four micrometres, about one-tenth the width of a human hair, and a vertical resolution of 0.5 micrometres, or eight times better. This

allowed the scans to record the depth of minute scratches in the metallic surface of the artifacts.

Other members of the team, including mechanical engineers Xiaoyu Alan Zheng and Johannes Soons, used a technique called confocal microscopy to image selected regions of the artifacts at higher resolution.

Although this was an unusual project for the NIST ballistics team, its members do spend a lot of time imaging bullet surfaces. Their regular work has them researching advanced forensic techniques for identifying firearms used in crimes.

To view a video on how they preserved the JFK assassination bullets please visit: <https://www.youtube.com/watch?v=JdBp3TU8r34>

For more than a century, forensic examiners have matched pairs of bullets by viewing them under a split-screen comparison microscope. If the striations on a pair of bullets, or on microscopic photographs of those bullets, line up, examiners might consider them a match.

The NIST ballistics team is developing methods for comparing bullets using 3D surface maps, which can provide greater detail and accuracy than comparing two-dimensional images. It's also developing methods so that, instead of just saying whether or not two bullets appear to



Thomas Brian Renegar examines the positioning of the bullet before the scanning run begins.

Twenty-two such scanning runs were needed to fully capture all the surface details of the stretcher bullet from every angle, resulting in 1,699 individual measurements of the bullet's surface

match, forensic examiners will be able to statistically quantify their degree of similarity. This research is part of a larger effort by NIST to strengthen forensic science so that judges, juries and investigators have reliable, science-based information when deciding guilt or innocence.

Robert Thompson, the NIST forensic firearms expert who oversaw the project, says that the bullet fragments from the Kennedy assassination were bent and distorted in ways that made them difficult to image. "The techniques we developed to image those artifacts will be useful in criminal cases that involve similarly challenging evidence."

The team did not conduct any forensic analysis of the bullets from the Kennedy assassination. This project was strictly a matter of historic preservation. However, once the National Archives makes the data available to the public, anyone who is interested in analysing those bullets will be able to do so without risking damage to the originals.

Although Thomas Brian Renegar is too young to remember the event that indelibly marked the memories of an earlier generation, he feels deeply connected to that day in history. Speaking for the entire team, he said: "It was an honour to put our expertise toward such an important project."

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Prior to each scanning run, the system is calibrated using a known sample: NIST Standard Reference Material 2460, better known as the standard bullet

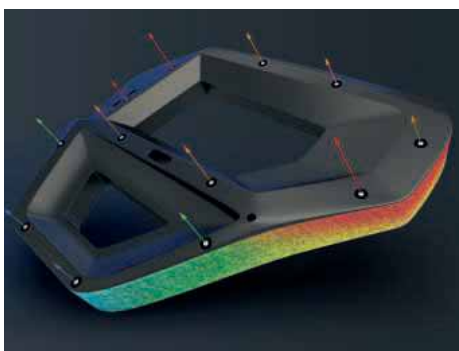
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GOM Software analyses surface strains, 3D displacements and 3D deformations with new features

GOM is now offering new and additional application-specific features in its GOM Correlate Professional software. Interested users now have the opportunity to familiarise themselves with the advantages of the Professional version free of charge for 30 days without any contractual obligations.

With GOM's optical 3D ARAMIS system, materials properties and behaviour throughout the design and manufacturing workflow can be well understood. This contributes to improved product quality, reduced costs and time for the research & development department in the automotive, aerospace, civil engineering, consumer goods and biomechanics industries as well as universities and institutes. The GOM Correlate software is used for the inspection and evaluation of 2D or 3D data that derived from the ARAMIS sensor or other metrology systems. The GOM Correlate Professional software offers all features of GOM Correlate plus additional user benefits to increase the efficiency of the workflow among other things.

One application-specific feature is vibration analysis that can be well used in the automobile and aerospace industries. For example, the fan blades of modern turbines for the aerospace industry need to be continuously checked, inspected and, if necessary, maintained to withstand extreme operating conditions during their lifespan. GOM's 3D testing system ARAMIS perfectly supplements GOM's ATOS system, which measures surface defects of fan blades. The ARAMIS system can be used to record 3D displacements during a hammer impact test.



Then, the software shows the displacements of all points measured with different frequency responses in a full-field or point-based manner in all three spatial directions. Based on this data, the Operating Deflection Shapes (ODS) can be calculated to compare them to the simulation mode shapes.

One new feature from GOM Correlate Professional is specialised for the automobile industry, which enables contour detection and the analysis of airbag deployment tests. This new software tool tracks the contour of the airbag in any high-speed video recording and helps to identify the maximum deflection point in the local coordinate system of the steering wheel.

Another new feature of crack tip detection makes the tracing and evaluation of the trajectory of crack points possible. It can be used for a wide range of applications in research of materials, such as metals, plastics and composites and in many industries with high security requirements. In the civil engineering industry, for example, ARAMIS can be used to check cracks of several sides of concrete samples simultaneously, with its measurement results displayed in the software.

Furthermore, the measured data from typical materials testings, such as Nakajima, bulge, tensile, bending, shear and hole expansion tests, is evaluated in the software to determine the material characteristics. This data is used as input parameters for the numerical simulation, enabling a more precise material model and a more accurate prediction of material behaviour. Also, the measured 3D data could be combined with imported temperature data from an infrared

camera in the GOM Correlate Professional software, so that the correlation of the thermal and mechanical component behaviour can be obtained and analysed.

Additionally, project templates can be carried out to repeat evaluations fast and easily. In a project template, among others, inspection elements, project keywords and reports are saved. It is not required to set up the project again when carrying out another evaluation of the same type.



To increase the efficiency of your workflow, the GOM Training Center offers classroom trainings, eLearnings and sample data sets for the software at training.gom.com.

Find more information about the free 30-day trial of the GOM Correlate Professional software at www.gom.com/3d-software/gom-correlate-professional.html

GOM specialises in industrial 3D coordinate metrology, 3D computed tomography and 3D testing. From product development to production and worldwide distribution, GOM offers machines and systems for manual and automated 3D digitising, evaluation software, training and professional support from a single source. In industries such as automotive, aerospace, energy and consumer goods, more than 17,000 GOM system installations are in use internationally. At more than 60 locations and with more than 1,000 measurement technology specialists, GOM guarantees profound advice and first-class service.

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Roller bearings – the KLINGELNBERG “Done in One” measurement solution

Roller bearings have to fulfil a variety of different tasks. They need to provide high stability for shafts while providing low power losses and a high durability. Therefore, the requirements concerning material, geometric and form accuracy as well as surface roughness, are challenging for manufacturing. To ensure the quality in today's manufacturing environment, a variety of different precision measuring devices is required. Typically, dimensions are measured on a CMM, form and noise on a form tester, surface roughness on a surface tester and contours (e.g. edge radius) on a contour measuring station. This results in high investment and operating costs. Finally, the operator has to set up the part on all different stations, which makes the measuring process quite long and keeps the operator unnecessarily occupied.



The Klingelberg P-Series for Done-In-One measurement

Klingelberg follows the “Done-In-One” principle. A Klingelberg P-machine is capable of fast measurement of dimension, form, contour and surface roughness in one setup and one automated cycle. This reduces the investment and helps to reduce the operating cost by an average 46 percent compared to current practices in bearing industry. The Klingelberg P-Series measuring machines keep the necessary accuracy even on the shop floor, saving the air conditioning costs and bringing the measuring machine really close to production. By removing the need to install multiple machines, customer benefits

additionally from saving expensive factory space.

The precision measuring centres from the Klingelberg P-Series are manufactured from steel and cast iron. The temperature behaviour throughout the whole machine is similar and predictable and is therefore compensated. In addition, the complete absence of granite, makes the machine totally insensitive to humidity. Accuracy can therefore be achieved within a temperature range of 15 to 35°C with a maximum allowable variation rate of 2°C per hour and 12°C per day. To be prepared for the shop floor, the machine can even be equipped with an active vibration platform so that all influences of external factors can be fully isolated.

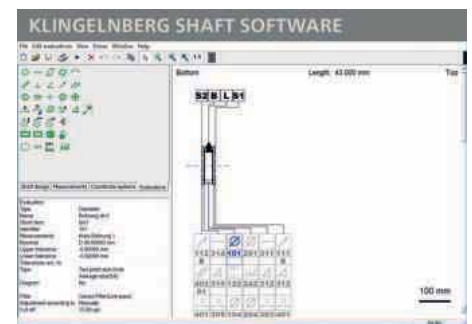
Klingelberg has a ten-year record of more than 500 measuring machines performing high precision tasks on the shop floor throughout the world. The rotary table, by itself has a radial run out of only 0.2 µm. Together with the Klingelberg designed 3D NANOSCAN measuring head, the capability to perform form tests is therefore fully guaranteed. An automatic three-jaw chuck offers controlled and low clamping forces. For very thin rings it can be equipped with magnets on the jaws to fix the part as shown in the photo. This allows high precision form testing with absolutely no influence of the clamping on the measuring results.



High precision rotary table with smart clamping

Generating the measuring program with the Klingelberg “Shaft Software” is an easy task. For roller bearings an automatic measuring cycle generation based on a parametric description of roller bearings is available. The measuring program for one

bearing type only therefore needs to be generated once. Reading within the parameters from a data source, the measuring cycles for different sizes of this bearing type are automatically generated without any user interaction. An example of different bearing sizes with the parametric measurement program generation is shown in the photo.



Parametric measuring program generation

An example with results for different kinds of measuring tasks are shown in the following photo. Standard tables with the actual values, the nominal dimensions and tolerances for GD&T measurements as well as graphs giving an idea of the form error shape are listed here. This way the machine operator receives all necessary information in order to analyse the manufacturing process and find measures for quality improvements. For surface roughness, there are options to choose the graphical view as well as the specific values according to the relevant standards. Special evaluations are also available including the Fast Fourier analysis FFT to analyse roundness errors as well as noise issues caused by a bearing.

All these measurements can be performed on the shop floor. The measuring machines of the Klingelberg P-Series are all equipped with temperature compensation by design as well as a temperature model to ensure accuracy in a production environment.

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Cooney South invests in Timesavers to address changing customer needs

Founded in 2017 following a merger of the metal fabrication department of Sunseeker and Cooney Marine, Poole-based Cooney South has seen significant growth in its business supplying high-end superyacht manufacturers in the UK with precision stainless steel and aluminium components. This has been achieved through investment in machinery and people, with its latest purchase, a Timesavers 22 WW Series dry finishing and deburring machine, providing a solution to two challenges being faced by the company.

The first of these challenges was a drop in quality of the polished stainless and aluminium sheet material being supplied to Cooney South. "With the quality of raw material falling off the result was that when after laser cutting, we were having to scrap components due to the finish not meeting customer expectations," says managing director James Cooney. "At the same time, we were under pressure to take quality to the next level, in terms of polished finish, by our customers in the superyacht sector."

This led to an increase in hand polishing of

components and delays. To overcome this, it was recognised that some automation was required. As its sister company Cooney Marine was already operating a Timesavers machine at its Kettering facility, the initial plan was to transfer work between the two locations. However, after further discussion the decision was taken to invest in a second machine. This then led to evaluation of what exactly was required with input from Cooney South management, shopfloor staff and the expertise of Ellesco.

"The Timesavers machine at Cooney Marine was a single head variant and, as we wanted to increase throughput, we initially looked at buying a three-head version of the Timesavers 22 Series," says production manager Chris Sleet. "When we visited Ellesco to carry out trials on our own components, we were drawn to the two-head machine and, after experimenting with a variety of belts with different grit sizes, we discovered that the twin-head machine was more than twice as productive as the single-head at Kettering. It was also much less expensive than the three-head



The twin-head configuration improves productivity

variant and so would save a considerable amount of money. Not only that, but with the twin-head being in stock could be delivered quickly to meet an urgent order.

"Ellesco came up trumps and the support we received from them was excellent, from initial training and fine tuning for our applications, through to installation, commissioning and follow up support. When it came to dust extraction, we had planned to use our existing supplier, but they couldn't meet the pressing deadline. Ellesco recommended Climavent, a supplier that it has recently started to work with, and the support of Climavent sealed the deal for us as they designed, manufactured and installed the extraction system within three weeks, which was vital to us getting the Timesavers machine up and running to meet this pressing order. I would say it was the slickest installation we have had, both here and at Cooney Marine."

The arrival of the Timesavers 22 Series at Cooney South enabled the company to meet the uplift in quality requested by its customers, 99 per cent of which are in the high-end marine sector, with products including some of the visual elements on superyachts, many of which require a mirror



The high-quality finish after processing sheet through the Timesavers 22 Series



The variable table height allows thin sheet and thicker plate to be processed



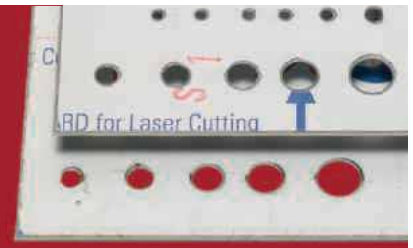
The response from Climavent ensured the Timesavers machine was up and running in a short period of time

finish. The two-head machine installed at Cooney South by Ellesco has a 900 mm wide table, which feeds parts past two abrasive belts, each of which can be fitted with differing grit sizes to meet the specific finish requirements of individual components. The result is that quality and consistency of the sheet coming off the Timesavers machine minimises the need for hand polishing. Furthermore, the speed of processing components is more than double the capability of the single-head machine installed at Cooney Marine and as a result of this additional capability and capacity Cooney South is opening up new opportunities to expand the business outside of its traditional customer base, with architectural clients coming on board.

"Apart from the initial requirement to meet a customer order, the main driver for this investment, and others that we have made and continue to make is to target growth and our willingness to invest is what customers want to see," says James Cooney. "The combined resources of Cooney South and Cooney Marine mean we can take flat plate from raw material, through laser cutting to mirror finish to superyacht standards, effectively under one roof. We have positioned ourselves, through investment in people and equipment to become one of, if not, the biggest suppliers of fabrication and polished products in Europe, in the sector we operate in."

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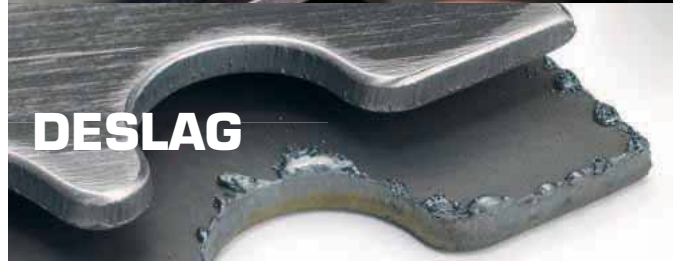
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Why wait for a technician when you can identify the solution using Lapmaster Wolters' remote access feature? Solutions for software and/or control issues on Peter Wolters machines can be found within minutes with the Lapmaster Wolters

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You may also choose to retrofit a machine with a few new parts and features to increase the productivity of the machine. Possible retrofits can include an extension of a loading table, a complete upgrade of the operating control system having the latest controls and measurement equipment, or other.

Training

Lapmaster Wolters offers a comprehensive customer training program tailored to your individual requirements. This training can take place either at your premises or at one

of our facilities. Furthermore, it offers comprehensive training for customers who would like to maintain their machine by themselves.

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The Peter Wolters brand has been established in the market for high-performance precision machines and systems for the finest surface finishing of different materials for centuries. Its products are successfully used wherever the highest requirements with respect to surface quality, plane parallelism, flatness and dimensional accuracy must be realised efficiently. It offers comprehensive experience and expertise from many industrial sectors, from custom and series production, from small businesses as well as from international corporations.

Founded in Chicago in 1948 as a manufacture of lapping and polishing machines for the mechanical seal market, Lapmaster has grown to a worldwide solution provider for more than 20 industries like precision optics and advanced materials.

Precision Surfacing Solutions supports manufacturers in a wide variety of industries in which precision grinding, lapping, polishing, deburring and advanced materials processing equipment is commonly used. They all need high-quality, high-precision, stable and well-engineered machines to manufacture high-quality work pieces.

Manufacturers are always facing major challenges in an increasingly globalised economy. Precision Surfacing Solutions provides a tightly integrated global network of engineering and production facilities. This allows it to offer customer service and support at the highest levels.

PSS's family of brands includes well-established machine tool brands such as Lapmaster, ELB-Schliff, aba Grinding, Reform, Kehren, Barnes Technology, Peter Wolters, and MCRON. The Precision Surfacing Solutions Group engineers and manufactures comprehensive system solutions which adapt to customer-specific production requirements, as standardised as possible, customised where necessary, everything from a single source.

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Outstanding deburring

Lincat Ltd production engineer Alan Roberts sings the praises of Loewer

At Lincat we produce high quality commercial catering equipment and it is important to us that we have a reliable and efficient deburring process for all of our flat stainless-steel panels, as we produce approximately 50,000 panels per week.

Historically we had used a belt deburrer then moved to a wet 3D belt and brush deburrer. We tried wet because we didn't want the dust and filthy panels usually coming off a dry deburrer. However, this proved very costly in maintenance over the years and the belt wasn't exactly "deburring" but more flicking the burr over and the brush system was never too effective at removing this "flicked" burr.

We approached Engineering Utilities for a solution

We were introduced to Loewer. We had in the past considered Loewer, but their machines didn't appear to be as heavy duty as others - we couldn't have been more wrong.

We visited the Loewer factory to consider what machine would be suitable for our needs. The factory is so clean, well-managed and the attention to detail regarding workmanship is outstanding, all a good sign of quality.

We considered the Loewer disc master 4TD, although this deburred our sample panels extremely well, I wanted to go faster and cleaner. I suggested adding additional motors to the grinding head making in theory a 6TD and to my amazement within 30 minutes a drawing had appeared with 6 motors on the head. They said: "We can make that if you wish", so I went for it. Can I have an air knife to blow the panels off as they leave the deburrer? Can I have extra extraction? Can I have doors everywhere for maintenance access? Internal lights? What



about a programmable control panel? Loewer bent over backwards for us, I got everything I wanted, what an outstanding company.

Our high spec bespoke machine arrived some time later and was installed by Engineering Utilities. We had a couple of small installation issues regarding extracting but this was to be expected due to the bespoke nature of the machine.

I did initially have a worry about how tough the machine would be as it wasn't as big as others. We have now had this machine approximately two years, its performance is outstanding.

It is approximately a third of the footprint of many machines with the same width capacity and it uses less power and less abrasives. We can feed some panels through at 5 metres per minute with a single pass, whereas our previous machines we could only achieve a reasonable finish at 1.2 m per minute with two or three passes.

Initially for the first few weeks we had to make some feed belt adjustments as the

belt bedded in and, from a breakdown point of view, we have had one contactor fail in the extraction system and that's it in two years. We run 24/7, but carefully maintain our equipment. Every night, the machine operator gives the machine a quick clean down at the end of the shift and maintenance crew a more thorough one weekly including a weekly clean and lubricate of the rollers and slides. This is important.

We have used many deburring systems in the past, but this Loewer 6TD is without doubt the very best solution for our needs from a performance, finish, maintenance and reliability point of view.

Would I recommend Loewer? Absolutely. Would we buy another Loewer machine? Yes, without question.

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ActOn Finishing partners with GPA Innova as UK distributor

A leading engineering firm headquartered in the Midlands/Coventry has launched a new partnership with a high-profile Spanish industrial company as part of ambitious growth plans.

ActOn Finishing, based in Torrington Avenue, Coventry, has joined together with Spanish firm GPAINNOVA as its UK distributor of DLYte finishing machines.

The partnership will enable ActOn, the UK leading surface finishing technology provider, to supply the cutting-edge technology to the manufacturing sector,

including the healthcare, aerospace, automotive and motorsport industries. It is part of growth plans to expand the business, which also has a ceramic media manufacturing facility in Malaysia, offering additional services to both new and existing clients.

The specialist machine combines grinding and polishing in a one-step process to produce smooth and shiny finished parts. It is used for metal parts which require high performance or superior finishes, including steel and stainless-steel, cobalt chrome, titanium, nickel and other common metal alloys.

It is the first dry electropolishing system of its kind and the collaboration is set to have a huge impact the British manufacturing sector by reducing the polishing process time by around 75 percent. The new polishing concept will also dramatically improve the corrosion, oxidation resistance, lifespan and friction of a part.

Sid Gulati, operations director at ActOn Finishing, says that the DLYte fits perfectly with the firm's existing range of mass

finishing products: "We are very pleased to launch our partnership with leading Spanish engineering firm GPAINNOVA.

"We currently manufacture all surface finishing machines in the UK and distributing the DLYte will complement our current offering as we look to grow the business.

We are confident that through this collaboration we can offer an advanced process solution and help our customers overcome challenges in finishing their components.

"The finishing machine can polish complex parts without programming, producing a high-quality finish without leaving grinding patterns and micro-scratches. It provides fully automatic polishing to a mirror finish in one step and reaches every corner of the piece which cannot be accessed mechanically."

ActOn Finishing Ltd

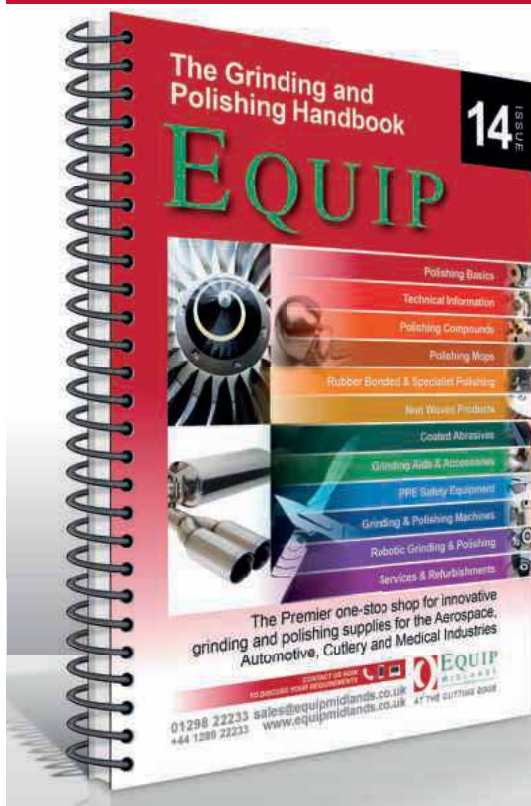
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The essential collection for grinding and polishing information from Equip, which includes the very latest products and services for the surface finishing industry.

Covering specific solutions in aerospace, automotive, medical, cutlery, construction and general fabrication.



Tool manufacturer “cuts his teeth” on ANCA machines

Jeremy Bunting grew up in the cutting tool industry and took the learnings and insights gained to build his very own specialist company, Facet Precision Tools.

He received a “hands-on education” from a young age and then using this experience to start his own business. From laying out a brand-new manufacturing centre to shaping and promoting Facet’s reputation and training up a high performing team who are passionate about the craft of cutting tools, he has built the foundations for success.

Here he describes his experiences in building a successful company using ANCA technology:

I began designing my first tools at age 14 in America as part of the family business, using manual grinding as well as conventional grinding to manufacture tools. After that I moved on to the applications side, getting exposure to feeds and speeds and eventually moved to Europe. In Europe I worked for different tooling manufacturers, seeing different approaches to manufacturing and precision tooling.”

I started Facet Precision Tools in 2015 primarily to service the aerospace and automotive sectors. Both these markets require special tools with distinct needs. At Facet we produce PCD, carbide cutting and coated carbide tools through distributors and direct to customers. Based in Germany, we sell locally as well as to France, England and Spain. Through distributors, we service Africa, Sweden, Turkey, Hungary, Austria, Italy and Mexico.

It’s challenging starting a new business. We had products in mind and were in a unique position where we could decide if these are our target markets, what machinery and equipment do we need? I considered my past experiences in the industry and how can I apply any learnings to the future. When we entered the market, I wanted to have high quality equipment, robust manufacturing processes and be producing market leading cutting tools.

Since opening, we have been growing steadily. In fact, last year we doubled our sales. As we expand, we are looking at how we can attract more customers, consider if we need to add additional products and as many people in the industry with



experience. We are always looking for good people.”

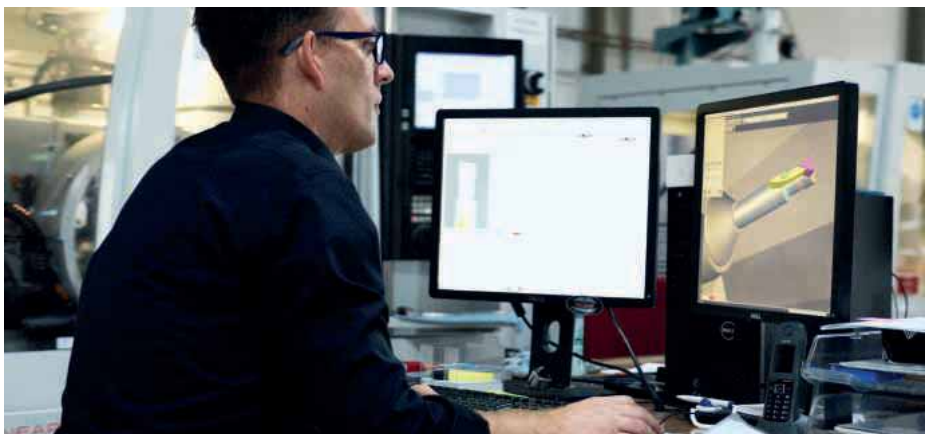
After deciding on a shop floor blueprint, we invested in a range of ANCA machines with two MX7 Linear’s, an FX7 and an EDGe as well as other equipment. We use the MX7s primarily for automotive tooling as they work well when grinding tools with larger diameters of 20, 25 and 32. We also run a lot of pocket grinding for PCD cutting tools on this model. The MX7 has a lot of horsepower that allows us to grind these tools in a very stable way. We use the FX for high volume carbide tooling. As an extremely rigid and thermally dynamic, stable machine I can rely on it to grind highly repeatable cutting tools.

On the MX7 we have an ANCA spindle speeder that allows us to achieve higher rpm. We worked with ANCA to adjust the software to be able to provide a better

stable pocket and a more accurate pockets in our grinding process.

On the EDGe we manufacture PCD tools. In the past couple of years, we have been developing PCD vein tools with our own blanks and cutting tool designs, working through and refining our processes. The EDGe has allowed us to have a high degree of accuracy when trying to grind a lot of the geometries. I found that as a process, erosion enabled the repeatability and the quality we were looking for. We also added a vision camera system on the EDGe, allowing for a quick inspection inside the machine, to get higher repeatability and better quality versus taking it out of the machine, and putting it back in.

Then there is ANCA’s 3D Simulator program. Up to 95 percent of the designs and problem solving are done on the simulator, testing the grinding process,



reviewing and modifying before you go into a machine. It is our strongest tool to increase efficiency and reduce waste and that is a major help to our profitability. For example, carbide is extremely expensive where you can be paying from 400 Euros for a 32 mm standard rod.

The simulator also shows estimated grinding times which has been a great tool for us to reduce cycle times. Last time it took us, for example, 20 minutes to make this tool, but after considering a new idea or different approach we can reduce that time to 18, 17 or even 15 minutes all through experimenting in a simulated grinding environment.

We have touch probes on all the machines that allow us to easily change wheel packs, qualify the wheel and start moving quickly. It also allows us to remove human error and ensures a higher finished quality. To be able to dress and probe the wheel, picking back up where you left off without having to change the setup is very advantageous.

One of the main reasons we love the ANCA machines is because of the software. We have found it to be extremely flexible and at Facet we don't use a lot of the standard ANCA programs and designs and instead do a lot of our work in profile editor, changing angles and profiles to meet the tool designs that we need. My Dad always said that ANCA was a software company that built a machine. Specials are a relationship business requiring communication and trust.

As we build our company we want to be

known for quality. From the start we have been trying to build our reputation for offering high quality tools rather than just entering a market and throwing anything out there and seeing what sticks. We are methodical in our approach to manufacturing certain tools or entering a marketplace or approaching certain things. Even if this means we are a bit slower and more tactful.

Just as important, is our responsiveness to the customer through deliveries and application support. These are the foundation of our company. We start by listening. What does the customer want to achieve and am I understanding their needs correctly? Then I consider how the product could be improved, can we make other recommendations. We turn that request into a tool design that is checked by the customer.

In aerospace, a common misunderstanding is the need for standard tools. Tools for aerospace require different lengths, diameters and applications. There is also a high requirement for accuracy. In Europe, for example, we find aerospace have applications that need to be measured to a couple of microns and use a variety of methodology to make holes in different materials. It is a challenge to make a product meet quality standards while working across a range of material applications.

I think working in speciality tools excites an element of craftsmanship. Every day is different, and you can take pride in your work, was it correct, was it to print. That is

why we look for a person who is flexible, shows an ability to learn, grow, and absorb information."

I train everybody in my plant like they've never seen a grinding machine before. We invest time to build their knowledge base to understanding the manufacturing and measuring equipment. Again, partially because we're into specials where every tool design is different, we don't have pre-written programs.

I think one of the best characteristics of a toolmaker is an attention to detail. Often people can become over invested in the productivity side. How many parts can I get through and how fast can I get them through the line? I train my team to be focused on the quality of the tool first and productivity second. To meet these expectations of quality, you have to have a high attention to detail.

Just as important is to develop your team to have a passion for grinding. The more passion someone has for the product, the more likely they are to stay. Teaching your employee how to make a better-quality tool feeds their creativity and teaches them it is okay to have your own approach and style. At Facet we have an open dialogue with our teams of why we do the things that we do.

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Vollmer sharpens up with Vgrind

Vollmer UK is demonstrating why it is the industry benchmark for cutting tool and saw blade production with the arrival of the latest Vgrind 360 tool grinding machine, the Vollmer CHX/HS and the Loroch K850-M for processing metal-cutting saw blades.

The groundbreaking Vgrind 360 is equipped with enhanced travel distances for accommodating carbide drills and milling cutters whose blanks are made from either solid carbide or carbide-tipped steel bodies up to 200 mm diameter.

With advanced kinematics that incorporate two vertical spindles, the Vgrind 360 allows multi-level machining. This gives customers the facility to produce large numbers of milling cutters and drills with speed and precision. The optional HC4 chain magazine system can accommodate up to 39 HSK-A63 tools in a compact floor area or up to 158 shaft workpieces, providing unparalleled levels of automated production.

Two vertically arranged spindles operate with a single spindle or horizontal double spindle. The vertical arrangement improves precision and stability, as the cutting tool is only ever machined on the fixed bearing side of the grinding wheel set. Furthermore, the grinding wheel set is always located on the C-axis pivot, drastically improving the precision of the sharpening process.

With this configuration located upon a polymer concrete foundation, unparalleled damping and vibration characteristics are guaranteed. All this ensures the Vgrind 360 delivers far superior surface finishes and accuracy for cutting tool manufacturers. As far as productivity is concerned, the Vgrind 360 achieves perfect interpolation through five perfectly harmonised CNC axes that have short travel distances and swivel ranges for all axes. This reduces processing times as non-productive times are slashed. Furthermore, the two grinding spindles can be loaded with different tools whilst an optional tool magazine with eight grinding wheel packages allows tools on the vertical spindles to be automatically changed.

Operation of the Vgrind 360 can be easily and individually adjusted thanks to a height-adjustable, pivoting control panel. The display can be positioned in such a way that the operator has an optimal view of the graphic interface and the work area also remains constantly in sight. To control the

machine, VOLLMER uses the uncompromising NUMROTOplus software that offers comprehensive applications for the production and re-sharpening of tools with the most challenging of designs and geometries.

The Vgrind 360 with the HC4 chain magazine system is a combination that has been specified the world over by the most recognised and trusted cutting tool brands.

Vollmer also recently launched the cost-effective Vgrind 360E with spindle options that differ somewhat from the Vgrind 360. Branded as a more cost-effective solution, the upper spindle of the Vgrind 360E has a belt driven spindle with 9 kW peak power and a maximum speed of 6,500 rpm, while the bottom belt driven spindle generates 23 kW of peak power with a maximum speed of 10,500 rpm. This flexibility also extends to the tool loading options, with Vollmer engineers available at MACH to discuss the opportunities with the HPR 250 free-arm robot loading facility and the HP 160 pallet magazine that supplies the Vgrind 360 with up to 272 workpieces for around-the-clock, unsupervised machining.

With its comprehensive range of machinery, the VOLLMER Group, which has sites in Germany, Austria, Great Britain, France, Italy, Poland, Spain, Sweden, the USA, Brazil, Japan, China, South Korea, India and Russia, enjoys global success as a specialist in tool machining in the



Production and Service divisions. The technological leader's range of products contains the most advanced grinding, eroding and machine tools for rotary tools, circular saws and band saws in the wood and metalworking industries. In offering this, VOLLMER relies heavily on tradition and the company's strengths: Local branches, quick decisions and rapid action by a family-run company.

The VOLLMER Group currently employs approximately 750 workers worldwide, with around 550 of these at the main headquarters in Biberach alone, including more than 50 trainees. The company invests around eight to ten percent of its turnover in the research and development of new technologies and products. As a provider of technology and services, the VOLLMER Group is a reliable partner to its customers.

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Gandtrack and GT Grinding use Walter technology to provide first-class tooling

It is no coincidence that the continued success of tooling specialist Gandtrack and sister company GT Grinding have been mirrored by their regular investment in Walter tool grinders and automatic measuring machines. Since the Walter Helitronics were installed (Gandtrack bought its first machine in 2000), the Oldham-based tool manufacturing and regrinding firms have enjoyed impressive growth in the supply of solid carbide, PCD and carbide brazed tip tooling.

With 28 employees between them, Gandtrack and GT Grinding, the latter focusing on low-volume batch work as well as modifications to specials while Gandtrack concentrates on production volumes, have installed a host of Walter tool grinding technology from Walter Ewag UK, a member of the United Grinding Group.

A total of 12 Walter machines (10 Helitronic tool grinders and two Helicheck inspection machines) have been purchased over the years. In each successive case, the new machine has resulted in a higher level of production efficiency, but it is Gandtrack's latest investment, a Helitronic Power with robot loader, that ideally illustrates why Walter remains the tool grinding technology of choice for managing director Brian Hirst and his management team, including director Adrian Jones.

"We found that machining batches of initially 20- to 60-off each month of comparatively long, up 140 mm to 280 mm, reamers in 15 different sizes and with long flute lengths of 70 mm to 90 mm wasn't proving ideal when using the machine steady," says Adrian Jones. "So we investigated the use of the Helitronic Power's automatic tailstock in conjunction with the machine chuck. We liaised with Walter AG in Germany, whose engineers prepared the program and, with carbide rods in hand, we spent a full day there producing the reamers.

"The demonstrations showed that we could halve the machining times and, importantly, not produce any scrap. It was a no-brainer!"

Explaining that the process allows the tailstock to be removed from the reamers for the completion of end work,



Gandtrack Director Adrian Jones alongside the Walter Helitronic Power with robot loader

Adrian Jones also highlights how the use of probing in conjunction with the tailstock/chuck "means the exact position of the flutes can simply be determined".

He points out that the choice of a robot loader instead of Walter's Eco loader, which Gandtrack/GT already have on four machines, was also determined by practicality as well as by the potential for increased production:

"The Eco loaders are great and they allow us to run machines unmanned as part of our two x 12-hour day shifts, but we wanted the best and fastest handling available, and we needed a pallet system able to accommodate tools of 2.5 mm diameter, as the Eco loader pallet, as standard, can't handle below 3 mm diameter, as well as 3.3 mm, 8 mm and 10 mm diameter. So, we chose Walter's robot loading option."

The robot loader can accommodate up to 7,500 tools depending on diameter/type, while the Helitronic Power can handle tools from 3 mm to 320 mm diameter, with a machining length of up to 350 mm. Up to seven pallets enable the 'chaotic' loading of a variety of tools when the optional automatic diameter detection functionality is employed.

Adrian Jones continues: "The combination of the latest Helitronic Power

and its automatic tailstock along with the robot loader has resulted in an output level that our reamer contract can't keep pace with i.e. 200-300 of each reamer size for the past 12 months. That's great news, of course, and it means we could switch other work to the Power while perhaps also releasing another machine to our plant in Malaysia, to join the Helitronic Mini Power already there."

Gandtrack's policy of investing in the latest Walter technology, which includes six Helitronic Power machines and a two-in-one Helitronic Power Diamond for carbide and PCD grinding/erosion to not only meet current demand but also create additional capacity, has been complemented by other initiatives that enable it to 'work smarter'.

These include having its carbide rods supplied to size, using an 'off-machine' dressing unit for grinding wheels, and now undertaking all brazing and rod cutting in-house. All have contributed to a business strategy that has also meant the company has been able to hold its prices for some time.

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Power skiving with fully integrated resharpener

Gleason vertical Power Skiving machines for production of soft and hardened gears up to 600 mm in workpiece diameter can now be equipped with an on-board cutter resharpener unit to greatly reduce cutter changes and help ensure consistently high quality.

The fully integrated on-board cutter resharpener unit is now available for Gleason vertical Power Skiving machines, allowing for the completely automated resharpener of cutters used in the production of both soft and hardened gears up to 600 mm in workpiece diameter.

By automating cutter resharpener operations, Gleason Power Skiving machines require minimum operator involvement, greatly reducing the time typically required for frequent tool changes and subsequent first-part inspection cycles. Additionally, the usual cost for external tool refurbishment can be avoided.

Compared to the typical cutter resharpener process, the new on-board unit is remarkably fast and simple. The machine's axes position the cutter to the

grinding wheel. The integrated cutter resharpener unit then executes the necessary grinding strokes while the cutter performs the infeed and the indexing from tooth to tooth, all performed automatically and based on the cutter geometry that exists after a certain number of gears have been cut. After the initial corrections are made based on the first gear cut, a consistent gear quality is more easily maintained throughout the complete tool life. The frequency of the resharpener cycles can be chosen depending on the gear quality required.

Tool cost-per-piece is also considerably lower as compared to external reconditioning with no tool changes, first-part-inspections and machine adjustments during a cutter's lifetime, as well as no handling and logistics costs for reconditioning cycles. With a lot less cutters in circulation, tool investment is significantly reduced.

Gleason is a global leader in gear technology solutions. Its mission of Total Gear Solutions ranges from the



development and sale of gear design software to the development, manufacture and sale of gear production machinery and related accessories, metrology equipment and automation solutions. Gleason has manufacturing operations in the United States, Brazil, Germany, Switzerland, India, China and Japan, and has sales and service offices throughout North and South America, Europe and in the Asia-Pacific region.

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NUM launches form compensation option for NUMROTO tool grinding software

NUM has launched a powerful form compensation option for its leading NUMROTO tool grinding software. The new option enables tool manufacturers to 'close the loop' between CNC tool grinding and measurement, in order to further increase process accuracy and consistency. The system inherently compensates for process variables such as temperature fluctuations and grinding wheel wear and is likely to prove especially popular with manufacturers of the latest specialist precision tools, which demand unprecedentedly tight production standards.

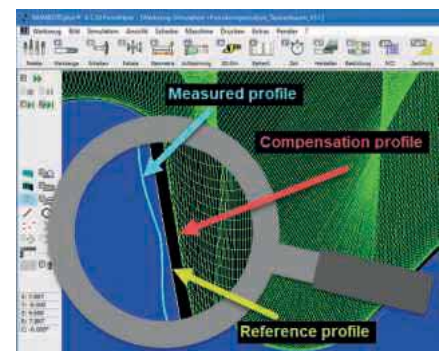
Operators seeking to maximise the accuracy of tools produced on CNC grinding machines generally use a coordinate measuring machine (CMM) to obtain probed measurements of the machined part, using this information to influence the production process during subsequent machining operations. Until now, NUMROTO users processed the results from the CMM with proprietary third-party compensation software running on an external computer, before feeding a

suitably corrected target profile back into the CNC machine.

Developed in conjunction with several key NUMROTO end users, NUM's new form compensation facility forms a fully integrated part of the company's form cutter package and completely dispenses with the need for any third-party software. The data exchange between the CMM and the CNC machine can be handled by XML interface or by export/import of the DXF file via a local area network.

The form compensation software employs advanced filtering algorithms to create a very smooth and precise compensation profile. The software always calculates the orientation of the grinding wheel and the path speed from the original profile, so that only the position of the contact point on the cutting edge is compensated and not the orientation of the grinding wheel. This ensures that the surface quality of the tool is unaffected by the compensation.

NUM's new form compensation option is compatible with NUMROTO version 4.1.2 or later.



First launched in 1987, NUMROTO software has become the preferred choice for many of the world's leading manufacturers of CNC machines for the production and re-sharpener of tools such as end-mills, drills, step drills, form cutters and many others. It is currently used on more than 6,000 machines worldwide.

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Floyd's new quick change tool grinding clamping system

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

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

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

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

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



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

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

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Top trends impacting medical device design and products finishing

Smaller devices mean bigger parts cleaning challenges

Ongoing advances in medical device design are meeting patients' demands for more portable and wearable medical devices. External health devices, or those worn outside the body, are getting smaller and lighter. Bulky devices like ECG monitors, spinal stimulators and insulin pumps are now tiny and discrete. The patient benefits of these advances can be life-changing with improved physical comfort and mental well-being. However, for manufacturers, building these new miniature, complex devices can be a challenge.

Smaller devices require thorough cleaning

Medical devices must be cleaned and dried to the highest standards and to ensure their readiness for the next step in the manufacturing process. Production debris like machining, stamping or cooling oils, dust, metal filings, marking inks, fingerprints and other soils must be removed prior to assembly, packaging, sterilisation or coating. Any remaining particulate or residue can lead to inconsistent outcomes and have an impact on the devices' performance.

Smaller medical devices have smaller spaces that can be more difficult to clean

and dry during manufacturing. They often include intricate shapes and tight crevices, all of which makes cleaning particularly difficult. In addition, modern devices are made with more delicate parts and varied materials. Softer plastics and lightweight metals can be easily damaged, so cleaning and drying must be done carefully to prevent harm. As a result, medical device manufacturers require newer, better cleaning fluids and methods to get the devices clean and dry. The cleaning fluids must penetrate all areas of the complex geometries, awkward shapes, and blind holes. Plus, they cannot leave residue or damage sensitive materials such as polycarbonate and acrylic.

What's old is new again

Vapour degreasing meets that demand and continues to grow in popularity for medical device cleaning and drying. A few decades ago, vapour degreasing was the preferred method for cleaning medical devices. It was easy to use and provided highly reliable cleaning performance. However, in the late 1990s, environmental concerns fuelled an industry-wide trend to switch from this process, which at that time used chemicals harmful to the environment, to aqueous-based cleaning systems. Although there

were disadvantages to using the water cleaning systems, like energy and water consumption, the environmental issues linked to many of the cleaning solvents at that time outweighed the benefits of vapor degreasing.

However, major advancements in solvent technology have generated more environmentally friendly fluids which have led to renewed interest in cleaning through vapour degreasing.

Modern vapour degreasing fluids feature excellent materials compatibility, making them well-suited for cleaning delicate plastic parts or mixed-material devices. They also have low surface tensions and high liquid densities, meaning they penetrate parts to clean them thoroughly. Even more importantly, the cleaning fluids dry quickly without leaving any moisture inside the devices that can cause corrosion or lead to bioburden issues. Medical device designers find this benefit of modern fluid cleaning to be of utmost importance because it doesn't limit the complexity of the product design. Also, vapour degreasing systems are not geometry-sensitive, meaning if the component will fit in the machine, the machine will clean it. This is beneficial because it reduces the need for expensive fixtures and it's an extremely forgiving process even when cleaning large quantities of parts.

The vapour degreasing process

A typical vapour degreasing system consists of two chambers, both filled with a modern cleaning fluid. In one chamber, the cleaning fluid is heated to a boil, which then generates a vapour cloud that rises to meet cooling coils. These cooling coils cause the vapours to condense and return to their liquid state. This liquid is then channelled back to the second chamber, the rinse chamber.

Soiled parts are immersed in the continuously filtered and distilled cleaning fluid inside the vapour degreaser to dissolve or lift the soils from the parts surface. In some instances, ultrasonic agitation is added for additional cleaning power. As the parts are lifted from the cleaning fluid, they undergo a brief vapour rinse and drying



Man checking ECG: portable medical devices are getting smaller and more discreet

process. The cleaning fluid condenses and drips back into the vapour degreaser to be reused. The vapour degreaser recycles and reuses the cleaning fluid for hundreds of times before it needs to be refreshed or replaced. This helps reduce the cost of hazardous waste removal. After a typical cleaning cycle of about 6-20 minutes, the parts come out clean, rinsed, dried and ready for the next stage of production.

Vapour degreasing - it's more than just cleaning

Using a vapour degreaser not only cleans effectively but also creates the opportunity for manufacturing efficiencies. For example, it is possible to combine the vapour degreasing cleaning process with a second-step surface treatment for the application of medical-grade lubrication or a specialty film. The versatility of the vapour degreasing cleaning process means parts are cleaned and coated in seconds, streamlining the overall process significantly.



Vapour degreaser overview: vapour degreasing meets that demand and continues to grow in popularity for medical device cleaning and drying

Future trends in cleaning fluid technology

Nearly all the recent advances in cleaning fluid technology are centred around developing safe chemistries that meet both cleanliness standards and environmental regulations, meaning they do not contribute to global warming and are not an ozone depleting substance. In the past, high-performing cleaning solvents such as trichloroethylene (TCE), Perchloroethylene (Perc) and n-Propyl bromide (nPB) presented air and ground water quality issues as well as health and safety concerns. That resulted in layers of regulations established to discourage their use. Early efforts to develop cleaning solvent alternatives initially resulted in mild cleaning that did not meet cleaning standards, especially those needed in the medical device space.

Next generation cleaning fluids

Today, there are a number of modern cleaning fluids available that are both very effective and environmentally progressive. They offer excellent cleaning performance combined with a low GWP (Global Warming Potential) and low ODP (Ozone Depleting Potential) profile. They are formulated using a mixture of compounds that can include hydrocarbons like mineral spirits, isopropanol and ethanol. Depending on how the compounds are combined determines the cleaning fluid's effectiveness and its material compatibility. The vapour degreaser can use just one type of cleaning fluid or it can be mixed, blended or custom formulated to remove a specific soil from a specific device, maximising its cleaning effectiveness.

Due to their improved environmental and safety profiles, these modern vapour degreasing fluids make ideal long-term replacements for the less planet-friendly solvents like nPB, Perc and TCE, plus the new cleaning fluids are sustainable. This means they not only meet today's environmental regulatory demands but are also equipped to meet emerging "green" rules in the future.

Going greener to clean

These next generation fluids maintain or even increase cleaning consistency. This reduces scrap and rework which lessens the amount of raw materials used to complete an order, plus fewer scrapped parts get sent to the landfill. Many of the modern cleaning fluids have a lower boiling point than the older solvents. This reduces the amount of energy needed to heat the cleaner inside the vapour degreaser. The result is less fossil fuel consumption, a lower total carbon emission and less greenhouse gas output. In addition, the vapour degreasing process uses zero water, helping ensure future populations will have enough of this vital non-renewable resource.

Conclusion

As the trend toward miniature external medical devices continues, manufacturing them becomes more challenging. Devices continue to shrink in size and weight while growing in complexity. Intricate geometries, awkward shapes, and internal blind holes are now common features of the designs. Efficiently cleaning the devices without



Thread polishing: production debris like machining, stamping or cooling oils, dust, metal filings, marking inks, fingerprints and other soils must be removed

damage is also more difficult. Therefore, medical device manufacturers are opting for new methods and tools to properly clean them. Modern cleaning fluids and vapour degreasing equipment offer better cleaning and coating flexibility. They provide effective and consistent cleaning to meet cleanliness standards and strict performance guidelines, both now and in the future.

Companies looking for information about the vapour degreasing process and modern cleaning fluids should consult with a partner that has medical device cleaning and vapour degreasing expertise. A cleaning partner can help conduct on-site audits or perform in-lab tests with sample parts to ensure cleaning success. Based on specific parts make-up and the contamination encountered, they can recommend or formulate the fluids and device cleaning methods that will work best.

Jay Tourigny is senior vice president at MicroCare Medical. He has been in the industry more than 30 years and holds a Bachelor of Science degree from Massachusetts College of Liberal Arts. He holds numerous U.S. patents for cleaning-related products that are used on a daily basis in medical, fibre optic, and precision cleaning applications.

For more information, visit www.microcaremedical.com, or contact:

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MicroCare Europe (UK)
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Bespoke washing technology – because not every manufacturing process is the same

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

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

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

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

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

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

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

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

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

The combination of high flow wash and

rinse processes and dedicated jetting of the critical features provides extremely powerful cleaning and highly successful contaminant removal.

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

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

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

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

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

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

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www.mecwash.co.uk



Mobile quality control for cleaning and coating baths

Industrial quality assurance is about reliability, speed, and ease-of-use. When it comes to regular checks of the cleaner or wetting agent content in a bath, the BPT Mobile Bubble Pressure Tensiometer is prepared for these demands.

You can capture the surfactant content of your bath within seconds using surface tension with the BPT Mobile. The quality inspector using it knows immediately if the bath is okay thanks to an ad-hoc evaluation. Moreover, for proactive adjustment of the bath, the BPT Mobile shows how the surfactant content decreases over time due to removed parts, for example.

With the intuitive touch display, working with the BPT Mobile is almost like doing quality tests with a smartphone. Thanks to the large display, functions are easy to hit, even with lab gloves. Programmed measurement templates and the fact that the instrument is insensitive to changing immersion depths provide for user-independent quality control.

The BPT Mobile works independently

from a computer or the power grid and is simply recharged via USB. Up to 20 million results find room in a clear, customisable folder structure. The display shows all necessary graphical representations and makes evaluation in other software obsolete, yet possible thanks to a fast data export to Excel.

Costly, high-maintenance permanent capillaries that are customary for the bubble pressure technique have been replaced with disposable ones. Inserting and ejecting them is a matter of seconds, cleaning them a matter of the past. The temperature sensor, which is read out for each measured value, can also be quickly removed when testing soiling or corrosive solutions.

With just a click, a monitoring measurement gives the instant result in the framework of the regular quality routine. The BPT Mobile uses a defined bubble production speed (surface age), presents the result within seconds and automatically evaluates it using pre-defined quality limits. Charts with the history of results, even

independently for several baths, help you estimate when the content will leave the quality range so you can intervene in time.

Measurements in the Continuous mode record a live value over time. When adding the active substance to the bath you instantly see the effect and know exactly when to stop. The Dynamic mode of the BPT Mobile can spare you a separate lab instrument for setting up the quality process. With a wide surface age range between 10 and 30,000 ms, this mode reveals the dynamic behaviour of the surfactant.



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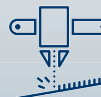
Aqueous Cleaning



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Surface Processing & Selective Cleaning



Ecoclean: the expert for parts cleaning and surface treatment

Reacting specifically to changing requirements

In many industries, companies are confronted with far-reaching changes that also have an impact on parts cleaning. Ecoclean is responding with several new developments. A prime example is the advanced multi-talented EcoCwave designed for challenging aqueous cleaning tasks.

Increasing demands on parts cleanliness, new manufacturing technologies, modified processes and/or materials, smaller lot sizes right down to lot size one, changes in regulations, digital transformation and stricter energy efficiency and climate protection targets. All these have an effect on parts cleaning.

Ecoclean and UCM, the division of the SBS Ecoclean Group specialising in high precision cleaning, are experts when it comes to parts cleaning and surface treatment. Their answer to these changes is to offer optimally adapted solutions and innovative developments which complement their extensive range of standard and special solutions for batch and single parts cleaning. Deburring and cleaning in a single step, the effective removal of film-type chemical contamination, the selective, in-line treatment of functional surfaces or solutions for cleaning additively manufactured parts are just a few examples.

With customised processes and cleaning equipment tailored to the task at hand, Ecoclean is also meeting demands from specific branches of industry, such as electromobility, medical engineering, maintenance and reconditioning.

EcoCwave for water-based cleaning

Designed for immersion and spraying processes, the EcoCwave system has a vacuum-tight work chamber and is capable of anything from preliminary and intermediate cleaning right up to precision cleaning. To achieve this, the all-rounder comes with two or three tanks as standard,



Thanks to innovative process technology, the EcoCwave can handle even large product quantities efficiently. Its state-of-art features help to ensure a high cleaning quality, long bath life and cost-efficient cleaning processes

which are arranged vertically and designed for optimised flow conditions. This prevents chips and dirt from accumulating. Each tank has a separate wash solution circuit with full-flow and bypass filtration. The design of the roll-over unit integrated in the work chamber also ensures that all sides of the part to be cleaned are fully exposed to the wash solution, for example during ultrasonic or spray cleaning. This results not only in a better cleaning performance but also in extended bath lives and, therefore, reduced costs.

Other forward-looking service solutions from EcoClean include an iOS and Android compatible Service app for maintenance and repair requirements, tailored service and maintenance concepts, developments regarding the digitisation of cleaning processes, options for modernising and adapting systems, as well as training programs for customer employees.

The SBS Ecoclean Group develops, produces and markets forward-looking

machinery, systems and services for industrial part cleaning and surface treatment applications. Its globally leading solutions help companies around the world in conducting efficient and sustainable manufacturing to high quality standards. The client base comes from the automotive industry and its suppliers in addition to a broad range of market sectors ranging from medical equipment, micro technology and precision devices through mechanical and optical engineering to power systems and aircraft industry. Ecoclean's success is based on innovation, cutting-edge technology, sustainability, closeness to the customer, diversity and respect. The Group employs a workforce of over 900 at its 12 sites in nine countries worldwide.

EcoClean UK

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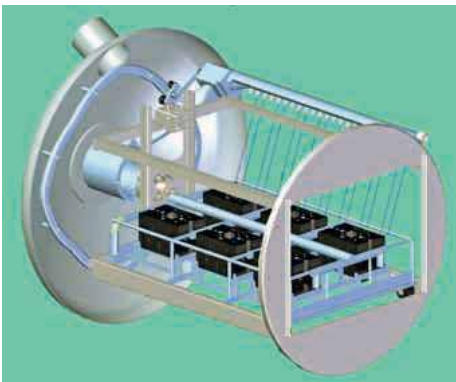


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Vector kinematics boosts cleaning efficiency

Component cleaning specialist Turbex is announcing optional functionality available in two of its industrial washing machine models, Java and Palma, that increases the efficiency of washing components, improves their cleanliness and widens the range of applications that can be undertaken. Called vector kinematics, the patented feature is in addition to process-specific, targeted cleaning, announced at the last MACH show, which is tailored to large-scale cleaning of families of similar parts.

The new vector motion extends an already advanced global cleaning method, also patented, whereby the basket of components and the aqueous spray system can be made to rotate in either the same or opposite direction, or both sequentially, within a program. What the kinematics adds is even more relative movement, shortening the washing time or increasing cleaning and drying effectiveness within the same cycle.



The Java and Palma models within the Turbex range of aqueous cleaning machines now have the factory-fitted option of vector kinematics to enhance the effectiveness of component cleaning

In contrast to a process employing an array of nozzles that are fixed in position, workpieces in the basket are not sprayed from one specific direction but from many angles, as the spray bar supplying the nozzles performs both its pre-existing rotation and a new rocking movement around its own axis by 35 degrees to either side. The basket co- or counter-rotates synchronously at an optimal speed calculated by the machine control to maximise penetration of the aqueous solution to awkward areas inside and on the surface of the components.

Tests have proved that this coordinated interaction between the spray bar with

kinematics and movement of the basket achieves considerably more effective component cleaning. Compared with rigid nozzle systems, the number of particulates remaining on processed parts is reduced by up to 70 percent for any given set of four cleaning parameters defined in the so-called Sinner's circle: chemistry, temperature, contact time and mechanical power, which determine the overall efficiency of any cleaning procedure.

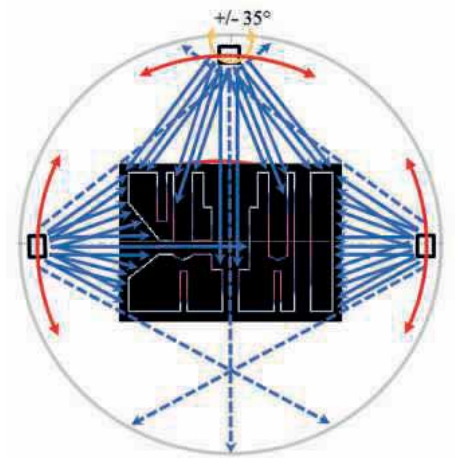
In particular, manufacturers of workpieces with complex geometries will benefit from the innovative process. The numerous angles of impact lead to significantly fewer spray shadows, so excessive cleaning of easily accessible component regions is avoided. Valuable resources are saved and the entire cleaning process is more efficient and economical. Undercuts and blind holes are easily reached during spray-cleaning, whereas previously this may only have been possible by flood-cleaning.

Processing of larger components

The heavy duty Turbex ACV-1.7-2 aqueous cleaning machine from the company's range of front-loading, spray washing and rinsing machines is also available. The latest feature of the latest-generation models, which have options for one, two or three process tanks, is a pump that is mounted vertically rather than horizontally, resulting in more powerful cleaning and much quieter operation.



A heavy duty Turbex ACV-1.7-2 aqueous cleaning machine from the company's range of multi-stage, front-loading, spray washing and rinsing machines



± 35-degree rocking of the spray bar supplying the nozzles increases penetration of the aqueous solution to awkward areas inside and on the surface of components

The machines are particularly popular in the UK for degreasing, precision cleaning, phosphating, paint removal, descaling and derusting. Manufactured from stainless steel, the ACV programme comprises both single- and multi-stage units with options for one, two or three process tanks. Standard sizes range from one to three metres in diameter, although larger versions are available.

These PLC-controlled machines provide a high level of cleaning performance due to ingenious design principles combined with elevated liquid spray pressures and flow rates achieved by the powerful pump. The spray system, also of stainless steel, rotates around a fixed load that can weigh several tonnes. Acoustic as well as thermal insulation protect operators from undue noise and heat.

Air blast and hotair drying stages are optional, as is gas instead of electric heating. Other optional accessories include steam extraction, automatic refill, an oil skimmer or separator and a detergent dosing unit. A manually operated spray lance with its own impeller pump can also be supplied, allowing particularly awkward soils to be removed. Alternatively, temporary use of the equipment as a manual spray booth is possible.

Ultrasonic lines for meticulous cleaning

The Turbex ProLine range of cleaning lines, intended for applications where a very high

level of cleanliness is needed, include an automated 550 system with three wet stages and a dryer plus load and unload stations. There are four variants in the modular, fine and ultra-fine cleaning line range: Easy, Auto, Semi and Auto+. Available in five tank sizes, they offer different levels of capability including semi-automatic handling. They also cater for various component weights and production quantities. The Auto+ model includes a noise reduction enclosure that doubles as a clean room interface.

A hallmark of these machines is multi-frequency ultrasonics, enabling a single transducer to generate two different ultrasonic frequencies. Cycle times can be significantly shorter and there is the added advantage that dis-similar components and materials can be processed in the same tank. Different drying systems are available including hot air, infrared and vacuum to allow optimum processing of different materials.

All products, which range from bespoke, multi-stage cleaning and drying lines down to small bench-top units, are aimed primarily at high-end manufacturers in the optics, medical, and precision manufacturing



Aimed at precision cleaning applications, the Turbex automated ProLine 2 550 aqueous system has three wet stages and a dryer plus load and unload station

industries. However, companies in the aerospace, automotive, nuclear, electronics and general engineering sectors also use this equipment.

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ProSolv® high performance vapour degreasing solvent is a simple “drop-in” replacement for n-Propyl bromide and trichloroethylene.

Vapour degreasing is one of the most widely used cleaning systems in the engineering industry. The most commonly used solvents are based on Trichloroethylene, n-Propyl bromide and other chlorinated solvents which, under EU REACH regulations, may require authorisation for use as metal cleaners after July 2020. If you are using vapour degreasing solvents based on any of these solvents EnviroTech Europe can offer excellent drop-in replacement products developed from 40 years of experience supplying market leading cleaning solvents to the engineering industries.

ProSolv is an alternative chemistry developed by EnviroTech Europe to replace chlorinated solvents. It can be used in most existing vapour degreasing equipment and can be used safely for immersion cleaning using ultrasonics, for which it has been optimised. with a high specific gravity and very low surface tension.

Unlike some other chlorinated and halogenated blends such as trichloroethylene, ProSolv is an excellent choice to replace flammable solvents such as MEK, Acetone, Isopropyl alcohol (IPA) or hydrocarbons where manual wiping or brush cleaning is the preferred method. It is a non-flammable azeotropic blend which can be used for manual cleaning in suitably ventilated areas and recycled by distillation for reuse through many cycles. It is a very stable mixture with no need for monitoring or the need for additives or stabilisers.

In other applications ProSolv offers a cost-effective alternative for halogenated solvents in formulations for dip, spray or aerosol applications and as a fast-drying carrier solvent for oil, silicones and other lubricants. Simple to install in any standard machine for vapour and vapour liquid degreasing.

ProSolv is non-flammable (no flash point) with high solvency (KB Value 91) with a very low surface tension and low boiling point making it highly productive and economical in use. A very stable azeotrope in use no additives or testing required.

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Importantly the ProSolv formulation is kind to the environment as it contains no hazardous air pollutants and is safe for users. It has zero ozone depletion (ODP) with very low global warming potential (GWP). ProSolv is compatible with all metals.

Manufactured in UK with excellent customer service, technical support and training from qualified distributors throughout Europe.

For more information, visit: <https://www.vapour-degreasing.com/prosolv>

EnviroTech Europe Ltd (ETE) is a specialist in all aspects of metal and plastics cleaning, pretreatment for finishing and surface protection and has a qualified network of expert distributors throughout Europe, ensuring high levels of customer attention and technical support.

Its technical staff were at the forefront introducing brominated solvents as alternatives to chlorinated solvents in the early 1990s, initially within the USA and the UK, then as a result of excellent

performance, to today's network of distributors throughout Europe.

Constant research to produce new products and services ensures we can meet the need of customers to ensure the very highest quality surface pre-treatments to produce finishes of the highest quality for the demands of increasingly competitive world markets.

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Envirotech's technical personnel are regarded as leaders in their fields and are in demand as writers, speakers and trainers in the area of surface pre-treatment and cleaning. The company's working partnership with other companies seeks to provide a total solution to individual needs in these fields.

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As an example, sometimes during a cell manufacturing process a small VOC solvent free parts cleaner is ideal to allow for manufactured products to be cleaned before a quality inspection check, so that the operator can work quickly and cleanly within the test area.



It can be difficult to clean applicators pails and spray systems after use but now the new VOC Free Solvent from Teknox UK simplifies and speeds up cleaning process. Being a non-hazardous VOC free solvent, it can be used in any open production area without emitting smells and fumes that are emitted from solvent based parts cleaners. These non-hazardous cleaners require minimum operator's personnel protection, i.e. only eye goggles and gloves.

The Bio X cleaning solution used within these cleaners is a bio-remediation solution that turns the washed oils and greases back into water. It is therefore not only safe for the operator but also does not generate any hazardous waste by products that require off site waste removal.

Are you using adhesives/glues/resins and paints during your manufacturing process? You can apply by wipe / soak & dedicated Teknox UK's L500 machine washer. It has a high flash point of 99°C and a low hazard profile with no Occupational Exposure limits.



Further information can be found at <https://teknox.co.uk/voc-free-parts-cleaners> or by visiting the website.

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Are you settling for second best?

by Richard Starkey, industry manager Aviation, SAFECHEM

For many high precision industries such as aerospace, medical, automotive and defence, industrial parts cleaning plays a crucial role in quality assurance during the production process. Inadequate degreasing can have a disruptive effect on many subsequent processes. Nevertheless, we see far too many companies using a suboptimal cleaning solution in their operations. There are various reasons behind this. Some businesses simply lack the knowledge and expertise to competently evaluate potential options. Others have been relying on one particular method for so long that they are not aware of alternative solutions. In many cases, plant operation managers have such deep-seated misconceptions about certain cleaning technology that they categorically rule out their use despite their proven cleaning quality. A case in point is solvent cleaning.

Although solvents have long been recognised to be one of the most effective cleaning agents, especially for highly specialised sectors, there is no shortage of myths surrounding their use. Common misunderstandings conclude that solvent degreasing is a dirty job; that it is bad for the environment or it is dangerous for workers. These beliefs are in fact nothing more than misconceived ideas. In particular, the unfounded fear about managing solvent risk and concerns about meeting Health, Safety and Environmental requirements has deterred companies from the use of solvents, and therefore robbed them of the

opportunity to reap the many tangible benefits solvent cleaning delivers.

Nowadays, solvent degreasing is well established in fully closed cleaning systems. Perhaps surprising to most, its efficiency is often superior to alternatives promoted as "more sustainable", since it does not require significant energy for drying and no water is needed in the process. Closed cleaning technology with internal solvent recovery further reduces the amount of waste to be recycled, thereby lowering overall cleaning costs. In addition, the supply, transport and storage of solvent in safety systems enables safe and responsible handling towards people, air, and soil as well as legal compliance. With sufficient worker training and risk management measures, handling solvent does not represent a risk factor any different than other potential hazard in the workplace.

When it comes to industrial parts cleaning, there is no one-size-fits-all approach. No one cleaning method would work universally. It takes a comprehensive evaluation to identify the most suitable cleaning method where numerous factors must be carefully considered, such as the types of metals and contamination, degree of complexity of components to be cleaned,

volume of parts, production oil used, regulations compliance and approved substances, to name just a few. Companies would be doing themselves a huge disservice if they immediately rule out established cleaning methods like solvent cleaning without even taking an objective evaluation of its advantages and risks, and the best approach to keep the balance.

Optimal parts cleaning process goes far beyond than just trying to achieve cleaning excellence. With the right combination of machine technology, cleaning agent and application technology, the critical cleaning process can be transformed into a value adding step that drive operational and resource efficiency as well as significant time and cost savings; in short, a competitive edge that can directly impact the bottom line.

The most important question remains: is your metal cleaning process a bottleneck in your manufacturing or is it creating value for your entire operation? And are you exploiting the full potential of your parts cleaning process to propel your business forward, or are you just settling for the second-best option? It might be time for a proper rethink.

SAFECHEM is an experienced provider of solutions for the safe and sustainable use of solvents for industrial parts cleaning, textile cleaning and asphalt testing applications. With offices in Dusseldorf, Germany and Shanghai, China plus a network of distributors, it serves over 5,000 customers worldwide.

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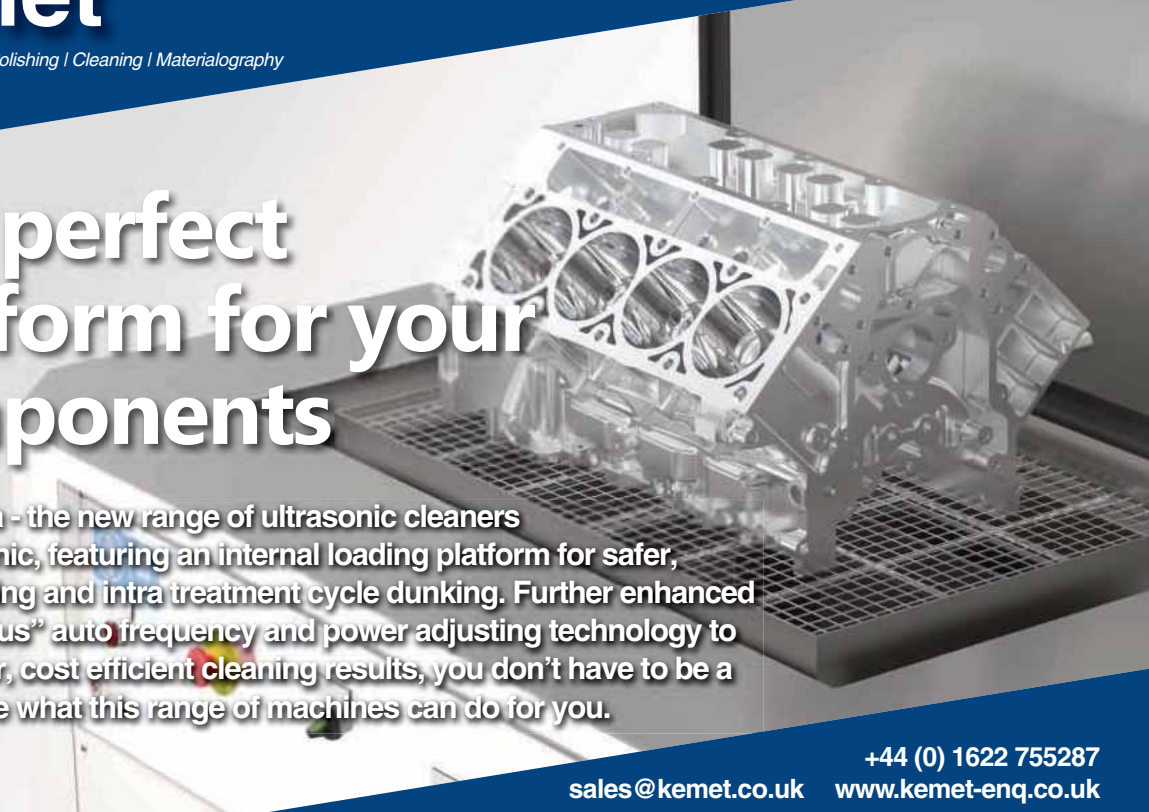
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Why surface cleanliness is crucial for electronic PCBs

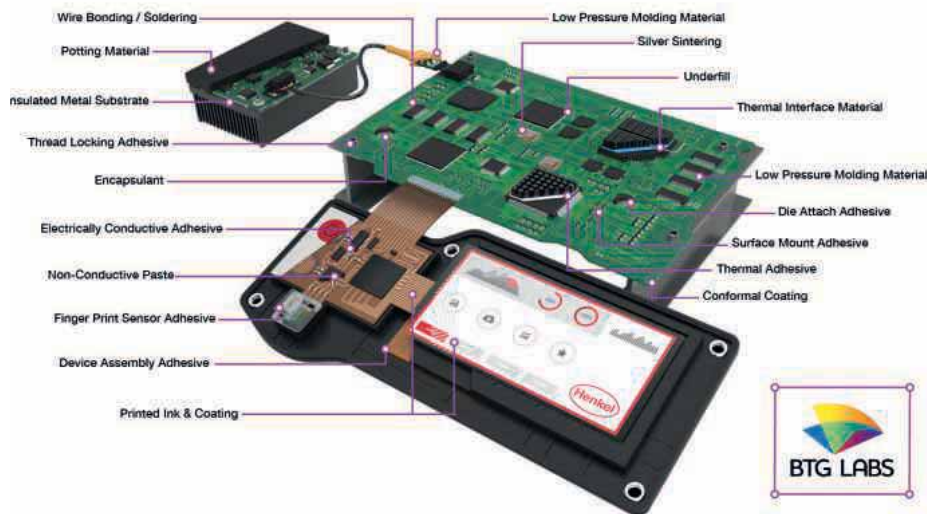
Defining “clean” is actually more complicated than it sounds. Cleanliness can be in the eye of the beholder and it can also be calculated and precisely managed to the nth degree. With regard to pcb cleanliness for electronics manufacturing, there has been one prevailing notion that has dominated the conversation for decades; ionic contamination has been the cleanliness concern for electronic assembly manufacturers for years. Ionic contamination can certainly lead to shorts in the circuitry of pcbs, but the problem is that the testing methods for this type of contamination are limited. They are not able to pinpoint areas of contamination and they are not able to account for any forms of contamination beyond ionic forms, leaving out all organic residues.

Cleanliness is crucial for predictable functionality of electronics because it: allows for confidence that conformal coatings will stick, ensures no nefarious species are trapped underneath the coating, increases reliability by removing threats of failure, like dendritic growths that cause shorts.

In order to appreciate the value of a truly clean surface it's important to understand the context of where the cleaning conversation is now.

In the 1970's and 1980's, military and manufacturing standardisation bodies like IPC wrote specifications for cleanliness of electronic assemblies. These primarily looked at the removal of flux residue, which is the leftover residue from a protective layer put on circuit boards to support soldering and reflow processes by reducing oxidation. The standards also clarified acceptable levels of ionic cleanliness.

Flux residue needs to be removed because it can trap moisture and



contaminants detrimental to adhesion and it can short out closely spaced conductors on a circuit board. This became a much bigger issue as electronics shrank in size and the components became more compact on the boards.

The advent of no-clean flux seemed to solve many cleanliness issues and streamline manufacturing processes, but failures in coatings and shorts still remained to an extent that was unacceptable in high-reliability applications. As electronics found their way into hi-rel applications like medical devices, mission-critical systems for military and aerospace vehicles and aircraft, and automotive sensor systems the need to remove flux residue and ensure complete dependability became a greater concern. Cleaning remained as important as ever.

We are in a new era of cleaning electronic assemblies where it is crucial to clean and measure the totality of contaminants on a board.

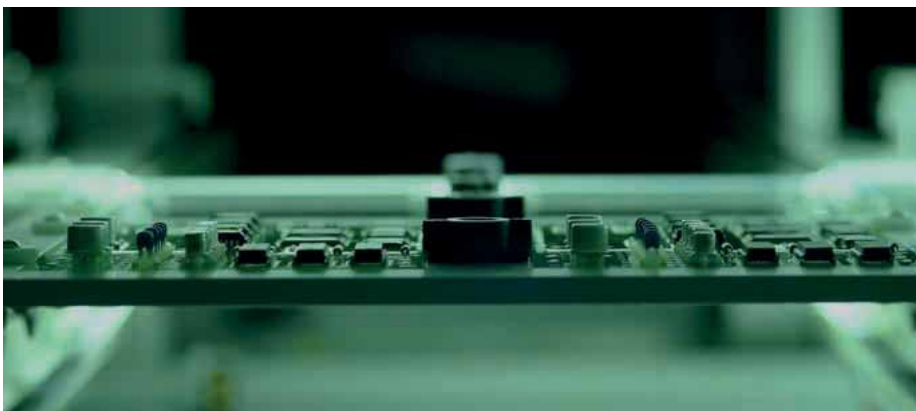
There are many options available for removing flux and to clean away the majority

of contamination found on boards that can cause inconsistent coatings or promote dendritic growth. The most common and effective cleaning method of choice is an aqueous bath and rinse cycle. Soluble contamination like ionic species, left over flux residues and basically all debris will be handled in industrial washes. Sometimes, although less frequently, a manual cleaning is necessary to de-flux some residue that has plasticised in the curing ovens and become just too hard to remove with a bath alone.

Cleaning standards have not changed drastically over the years. When talking about ionic contamination, the IPC-TM-650 standard sets an acceptable range of 0.1 $\mu\text{g}/\text{in}^2$ for military applications (0.65 $\mu\text{g}/\text{in}^2$ for general applications) of sodium chloride (NaCl). But as reliability expectations have risen this standard has had to be augmented. Merely cleaning for ionic contamination is not enough to prevent failures, and predominant cleaning methods are not meeting the challenge of high reliability requirements.

As it becomes more and more clear that organic contamination needs to be cleaned and a chemically clean pcb surface is required for reliable coating adhesion, surface treatment processes using plasma have become increasingly common.

Plasma treatment systems are high precision cleaning units that can target places on boards that are difficult to clean with traditional methods. Also, plasma is primarily used as a way of changing the chemical make-up of a board's surface. By bombarding the surface with a particular chemistry, molecular bonds are broken and



a highly active surface created, making a very bondable situation. Through in-line automation, plasma is an excellent option for high rate, high reliability manufacturing.

Ion chromatography (IC), Resistivity Of Solvent Extract (ROSE) testing, Surface Insulation Resistance testing (SIR), visual tests are all valuable tools to determine if an assembly is clean and each carry both benefits and drawbacks.

While ROSE testing remains by far the most popular and accessible method of cleanliness testing, it is not without its faults. ROSE testers are popular because of their speed and relatively low price point, but they are not capable of detecting all forms of possible contamination and the ionic contamination they do detect is averaged over the whole surface. If the test detects any contamination at all it cannot tell you where on the surface it is and it assumes that all detected contamination is evenly spread across the board.

A very useful method of pin-pointing contamination and getting a quantitative evaluation of organic contaminants is to use a water contact angle measurement. Water

contact angle works by depositing a drop of water on the surface of a material and measuring to what extent the drop expands (wets out) or constricts (beads up). If the water is attracted to the surface because the chemical composition has a strong attractive force on the water, it will wet out. This correlates directly to how the conformal coating will respond to the surface. With this measurement in hand you can effectively predict if your coating will bond well to your surface and then it can be used to understand if your coating is uniform across the surface as well.

Water contact angle is an excellent process check for all cleaning methods. If you take a measurement before and after each cleaning and treatment step these measurements can alert you to changes that you otherwise wouldn't have been able to see. These measurements can be taken directly on the line with an automated device or used as a supply chain management tool at a quality check point to inspect all incoming materials.

There are a lot of bonding sites and potential places for adhesion failure on the

surface of pcbs. All these areas need to be fully cleaned and inspected so they are entirely prepared for bonding and coating.

In order to control the totality of residues that cause coating failures and electrochemical migration (ECM) resulting in shorts, you need to have a definition of clean that includes all of the possible contaminants threatening your board.

Expectations of reliability are increasing and cleaning methods need to rise to the occasion. The best way to ensure your cleaning is effective is to measure it. The most efficient way to measure cleanliness is to evaluate all the materials involved at each step where contamination is possible and where cleaning occurs. These Critical Control Points need to be monitored through a data-driven test system that proves, definitively, that the surface is clean and bondable.

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Safe Solvents granted UK patent

Environmental technology business, Safe Solvents Europe Ltd has successfully patented its propriety Ambimization® method for process and parts cleaning, as of January 2020.

Ambimization provides businesses with a viable alternative to the use of hydrocarbon solvents, heated and caustic detergents. These substances have traditionally been used across all process and parts cleaning, but which today are at odds with the corporate values of employee safety, sustainability and productivity.

In contrast, Ambimization uses water-based fluids that work at ambient temperature, are non-flammable, non-carcinogenic and have a Volatile Organic Compound (VOC) level of just 6.5 percent. As Ambimization does not require fluids to be heated, it also prevents emulsification which, when coupled with the fluid's natural splitting properties, drastically reduces the volume and cost of waste disposal.

Safe Solvents' Founder and CTO, Tom Sands, comments: "Ambimization delivers a step-change in value for businesses

undertaking degreasing, component cleaning, parts washing and surface treatment. Not only does it de-risk a number of traditionally hazardous applications, it can facilitate operational change, driving gains in productivity.

"These operational benefits are unique to Ambimization. As such, it has the potential to be a major disruptor of the traditional solvent market. We are delighted therefore this proprietary methodology is now protected by UK patent."

Ambimization is suitable for the removal of many forms of surface contamination, from oil, paint and ink to highly carbonised metals. The method is compatible with a range of proprietary machinery, while the fluid is also available as part of a fluid-only contract for applications that require in-situ cleaning.

Founded in 2012, Safe Solvents Europe Ltd is an environmental technology business disrupting the traditional solvents market. From its headquarters in Maidenhead, the company has brought together extensive expertise from across the specialty chemical industry to develop Ambimization, the only



ambient temperature method of degreasing and cleaning industrial parts and processes which is non-hazardous, non-toxic, and non-carcinogenic. Ambimization is currently delivering a step-change in productivity for a wide variety of environmentally-conscious businesses across the UK, ranging from Formula 1 teams through to multinational OEMs, across the aerospace, automotive, marine and industrial sectors.

Find out more information on Ambimization at **www.safesolvents.co.uk/ambimization1**

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Foundry chooses a comprehensive shot blast solution from Rösler

In line with a capacity expansion, the fettling shop of the MMG Marsberger Metallguss Gebr. Cordt oHG was completely revamped to meet requirements for more capacity as well as improved quality and better ergonomics. The company invested in a new wire mesh belt blast machine, the modernisation of the existing shot blast equipment, two new dust collectors and a blast cabinet, all supplied by Rösler.

Since Marsberger Metallgießerei was taken over by the brothers Olaf and Oliver Cordt in 1996, the facility has undergone significant expansion. Today the equipment and services of this company include several lines for sand casting of different aluminum alloys, gravity die-casting and machining of these components on ultra-modern machining centres and lathes.

A complete package for the blast cleaning operation

In 2018, in order to upgrade the blast cleaning operation to meet today's requirements, the company decided to purchase a new shot blast machine, as well as modernise its existing shot blasting system. In addition, two new dust collectors and a manual blast cabinet were purchased. Thanks to the modern design, high quality equipment, comprehensive after sales service and the possibility to source everything from one single source, the customer decided to do this challenging project with Rösler. Another reason to go with the supplier from Untermerzbach was a referral from another foundry that had an excellent experience with similar Rösler equipment.

The new de-moulding blast system had not only to fulfil the challenging customer demands for blast cleaning quality, throughput and uptime, it also had to be easy to handle by the operating staff. In line with these requirements Rösler developed a foundry version of the wire mesh belt blast machine RDGE 1250-4-F with a split elevator to fit the machine into a building with a ceiling height of 5 m. Special attention was paid to optimized wear protection. For example, the blast chamber is completely made from manganese steel and lined with easy to exchange cast wear plates from



With numerous accessories, like a high-performance magnetic separator, the wire mesh belt machine RDGE 1250-4-F was perfectly adapted to the tough operating conditions prevailing in foundries

highly wear resistant material. The wire mesh belt, also made from wear resistant material, is designed for loads of 250 kg per running metre.

Four Gamma 400 G turbines, optimally placed around the blast chamber and with a drive power of 15 kW each, ensure that even extremely complex castings are perfectly blast cleaned. Compared to conventional blast wheels these high performance Rösler blast turbines, equipped with curved throwing blades in Y-design, generate an up to 20 percent higher blast performance while also maintaining a lower energy consumption. Their unique design allows for the full use of both sides of the throwing blades. Due to the clever quick-change system, a blade change can be performed very quickly without having to disassemble the turbine. This practically doubles the service life of the throwing blades. The wear resistant and energy saving Gamma 400 G turbines were also used for the modernisation of the existing shot blast system.

The new blast machine is equipped with a workpiece recognition system, making sure that the blast turbines are only throwing media, when workpieces are passing through the machine. With no workpieces

present, the machine automatically goes into stand-by mode. This also contributes to reduced wear and lower energy consumption.

The blast media volume of maximum 200 kg/min per turbine along with the belt speed is adjustable. The operator can automatically adapt these two parameters to the workpieces by simply selecting one of the blast programs stored in the system PLC. A workpiece height sensor allows the optimum adjustment of the blow-off station installed at the machine exit. This allows the removal of residual blast media carried out with the workpieces. The blast media recycling system is equipped with a high-performance magnet separator.

Because the castings are made from aluminum, the dust collectors for cleaning the exhaust air from the shot blast machines are in explosion-protected design. To save valuable manufacturing space, they are placed outside of the building.

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Automated blasting of aluminium castings

Two leading manufacturers in their respective sectors have decided to launch a joint project in the area of surface technology. The result of this is an automated blasting cell for mass-produced castings.

AGTOS is a manufacturer of shot blasting machinery operating on an international level. In addition to reliable, high-performance blasting technology, the company has extensive know-how in the area of workpiece handling and process optimisation.

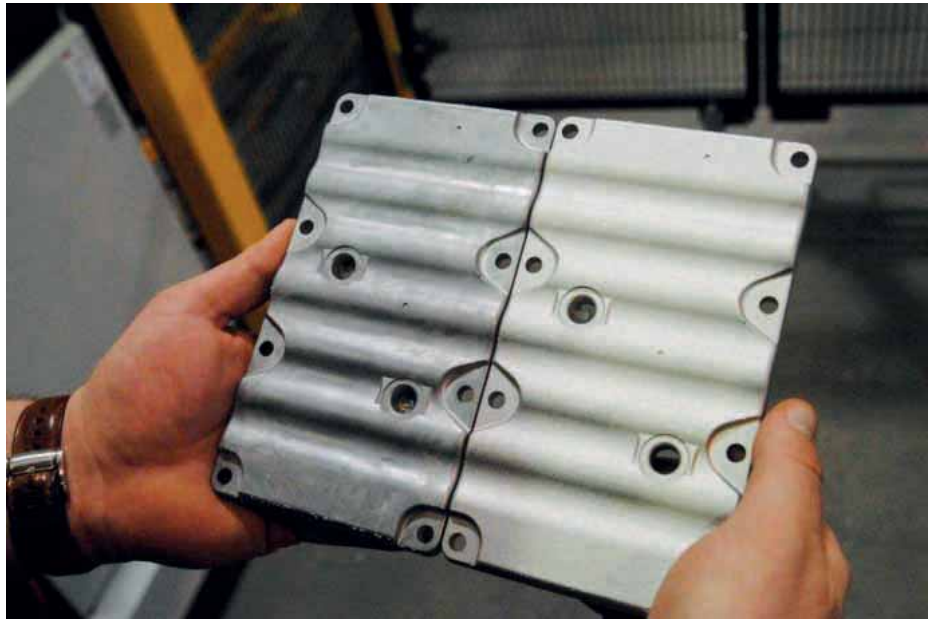
The SEW Group is a family enterprise operating all over the world, and SEW is a globally known name in the area of drive systems.

Around 475 personnel are employed at the SEW USOCOME plant in Forbach, France. This facility is the aluminium component competence centre for the SEW Group. A new AGTOS rubber belt tumble blast machine was installed here recently for post-processing of covers for terminal boxes and gearboxes. The blasting objective is the deburring of parts and creation of a uniform surface. Parts are washed and then painted following blasting.

Workpieces (covers for terminal boxes and gearboxes) were processed in a rubber belt tumble blast machine. This was manually loaded and unloaded and, as a consequence, had a longer cycle time. The number and variety of parts had also grown over the years, meaning that the capacity could no longer be achieved. There was evidently a need for a machine delivering a higher level of performance.

The effort involved in handling parts was too great. As the blasting machine represented a bottleneck, it was necessary to provide interim storage for the finished castings before processing them in the blasting machine. This required space, time and labour.

During planning, an idea matured with regard to time integration of the new machine in the process. The storage between casting and blasting was to be avoided, which entailed designing the machine so that it could blast quicker than new parts emerge from production. "Employees were to be relieved of tasks that do not directly add value to the workpieces," says Romain Zorzi, project manager for New Processes.



Workpieces before and after blasting

The idea of considering AGTOS as a blasting technology provider came from the blasting abrasive manufacturer. Workpieces were initially blasted in the AGTOS plant and that of another customer to test performance. The abrasive and machine were optimally coordinated during this, with the results being so positive and the cover of the workpieces so good that it was decided to purchase the new blasting machine from AGTOS.

This was followed by a phase involving concrete tests and calculations, with technicians from both companies working closely together to realise these. The solution is really impressive. In terms of design, manual loading and unloading of the blasting machine was initially retained. The elimination of interim storage on its own was a decisive advantage. The new blasting machine has a lower cycle time and is more efficient in terms of its overall blasting technology.

Prior to commencing installation, individual installation and implementation steps were defined during the course of a meeting. It became clear that positioning and installation of the assemblies delivered on schedule at the site posed a logistical challenge. Several suppliers and SEW needed to work hand in hand in this respect with regard to the blasting machine, crane, lift platform, energy and pneumatics. A major site was developed during



View of the blasting cell, with robot, blasting machine and conveyors

installation. The blasting machine was set up and connected while adjacent machinery continued operating. A complete noise reduction enclosure was simultaneously constructed.

Following installation of the machine, operation was changed from manual to robot loading. This is where technicians from SEW and AGTOS truly worked hand in hand. In addition, it was necessary to cover

the range of parts to be processed with a single blasting program. This task was solved by AGTOS. Quality and the cycle time for workpieces were defined at the outset in the specification, and optimum blasting parameters were determined through testing.

Today, the workpieces are only deposited in transport boxes in front of the blasting cell by the forklift driver, and finished parts are collected and conveyed away. Processing in itself is completely automatic. Following blasting, the workpieces are returned to the same transport boxes they were delivered in. This enhances the transparency of the process, and certification of quality is simplified.

Process sequence in the blasting cell

Several workpiece boxes are delivered by forklift to the blasting cell and placed on a roller conveyor there. The robot picks up the boxes individually and places them in a feeding system. This tips the workpieces into the opened trough on the blasting machine. The rubber belt moves after the door closes and mixes the parts, ensuring that turning of the workpieces is gentle. Maintaining low gap dimensions in the

blasting machine interior means that even very small parts can be blasted. The high-performance turbine located above blasts abrasive at the workpieces, reaching all surfaces as a result of the turning action. The abrasive is collected beneath the machine, precleaned and conveyed to the upper part of the machine. Further separation of dust and undersized particles from the abrasive is achieved here through an air stream. A wet filter unit creates the required negative pressure for this purpose. The cleaned abrasive is then made available again to the high-performance turbines and, consequently, the complete cycle.

Following blasting, the door opens and the rubber belt changes its direction of travel. The workpieces are gently directed as a result towards a vibrating channel that takes them to a conveyor belt which leads to the box filling system. The filled box is picked up again by the robot and placed in a removal area. The box in turn is taken from here by forklift to the next processing step. Competence in shot blasting technology

AGTOS blast machines are distinguished by a high degree of robustness, a long service life and maintenance-friendliness. The high-performance turbines are

designed to ensure extremely low wear, even in the severest of operating conditions. Moreover, they are capable of a high abrasive shot flow rate while requiring the same amount of energy as other turbines. They are extremely efficient as a result. The blasting chamber itself is lined with replaceable, highly wear-resistant manganese and tool steel plates.

AGTOS customers always emphasize the high level of maintenance-friendliness of these blasting machines. The entire machine is not only designed for long-term operation but also optimised for maintenance and the replacement of spare and wear parts. For example, AGTOS high-performance turbines are equipped with easily replaceable turbine blades.

Other servicing work such as replacement of the rubber belt can be quickly realised, thanks to a well-designed maintenance system.

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Vixen Surface Treatments turns 30

Vixen, the market leader in the production of wet blasting equipment celebrates 30 years this April

Founded in 1990, Vixen has established a worldwide reputation for manufacturing blasting, washing, degreasing and refurbishment machinery. Every year the company produce thousands of machines far and wide with customers in the likes of USA, South Africa and New Zealand.

Its most popular range is the best-selling Aquablast® machines. These wet blasting cabinets ensure a superior finish and are a perfect alternative to dry blasting. With a dust-free process and the addition of water mixed with abrasive media, parts are transformed to a like-new condition. Making this machine ideal for cosmetic surface finishing as well as industry applications such as automotive, medical and aerospace. This process allows for components to be kept cleaner for longer.

Aquablast machines are manufactured from stainless steel and are available in three different model sizes: 915, 1215 and 1515. Vixen can also offer completely bespoke models of the Aquablast with its in-house designs team to ensure each design meets the individual requirements of any company. It's no wonder customers worldwide purchase this blasting machine for its versatility.

Vixen's Aquablast machines not only aid and support productivity in companies, it also provides new business opportunities. After purchasing an Aquablast cabinet, customers in the UK and abroad have went on to set up their own vapor blasting business.

David Walkins from New Zealand set up 'Blast N Bits' after purchasing the Aquablast 1215. He said, "The Aquablast 1215 is very easy to get a professional finish on just about any component. I was using dry blasting before and it just wasn't satisfactory. I often do smaller parts in front customers and they are often surprised at how good their items come out.

"I had a wonderful service from Vixen. The exports manager answered all my queries about shipment to New Zealand. The machine arrived on time and was exactly what I expected and has worked faultless since. It is very well made, affordable and very easy to use."

Vixen also produces the Aqua Wheelblaster which has been exclusively designed for alloy wheel preparation. This cabinet uses the Aquablast process to perfectly etch wheels to create a key ready for painting and powdercoating. The

machine blasts, washes and prepares alloy wheels in one quick and simple step. This machine has revolutionised car bodyshops for its ability to prepare wheels in just 3 minutes instead of manual cleaning which can take up to an hour.

As well as its blast cleaning range, Vixen also manufactures washing, degreasing and phosphating equipment. This machinery comes in a variety of shapes and sizes and uses a spraying or immersion process for almost any size or shape of component, so the needs of every customer is met. This includes if machines are automatic, top or front loading or need to be developed as a conveyor or with a continuous inline Archimedes screw.

All Vixen's machinery is purpose built with the component in mind, as to whether parts can be processed individually or in batches. This range of equipment is also designed and built to allow for as many stages as needed. From high pressure wash, hot rinses to assisted dry. If a standard washing, degreasing or phosphating machine is not applicable, Vixen's in-house designs team can create and deliver such results.

Hydraforce in Birmingham, UK says: "Vixen stood above their competitors with their ability to listen and understand our requirements. They worked with us to design and develop a bespoke washing and cleaning facility line to produce clean and contaminate-free products."

This April and throughout 2020, the company will recognise its success of 30 years in the surface treatment industry, with special offers and exclusive event invites to customers.

One way it's celebrating this milestone is with a personalised Porsche GT3 which will see customers getting behind the wheel at exclusive track days throughout Europe, including Silverstone.

Make 2020 the year you purchase a market-leading machine from Vixen Surface Treatments.

For more information on Vixen's full range of blasting, degreasing, washing and phosphating equipment, contact:

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Guyson blast cabinet etches busbars

Guyson International, the UK's foremost industrial finishing equipment manufacturer, has recently installed a specially configured Guyson Euroblast® 7PF (Pressure Fed) blast cabinet into one of the world's leading designers and manufacturers of switchgear and instrumentation. The cabinet is to provide a blast etched surface, on their range of high voltage busbars, to improve adhesion of a special non-conductive coating.



Guyson Euroblast 7PF blast cabinet with extension box and high efficiency cyclone

The company's existing blast cabinet system had suffered from several operational problems, so the search was on for an improved solution with better blast media handling and operator efficiency. With three tenders in place, the operators and maintenance manager visited Guyson's 'Component Finishing Centre' at Skipton to try out Guyson's proposed manual blast system on their components. "All of the operators bought into the Guyson blast unit straight away and it was their unanimous preferred option" says the maintenance manager.

The chosen Euroblast 7PF blast cabinet is from Guyson's premier industrial quality range and delivers exceptional component access, with doors opening to the front, top and side, and so facilitates easy loading of components. In fact, with the blast chamber being oblong rather than square in shape, it proves a popular choice amongst customers for blasting longer components. But due to the length of some of their copper, silver and tin electro-plated busbars being even longer than the width of the Euroblast 7PF cabinet; a special cabinet design was needed.

This was drawn up, in 3D CAD, by Guyson's in-house design team and incorporated a 700 mm extension box on the left hand side of the cabinet, supported by legs, and a cut out profile in the right hand door, with blanking door to prevent media escape, so that longer busbars can be fed into the cabinet for selective blast

etching. The remainder of the pressure fed blast system includes a Guyson's G27 pressure pot, C800 twin cartridge dust collector and a 'High Efficiency' cyclone. This latter item is designed to remove the majority of dust and fines from reaching the dust collection unit, thus extending the life of the filter cartridges between changes.

Guyson Euroblast PF systems are designed for speed, giving faster cleaning times, up to four times faster than suction fed or venturi systems, to meet higher production requirements and at peak demand this blast system can be working for the entire length of a full shift so it is necessary that the blast system quickly produces a perfectly keyed surface for the powdered coating to adhere to in the oven.

Whatever your blast cabinet requirement, Guyson will have the answer. Contact Guyson's Customer Service Department to arrange free blast trials on your components, prove the process and make recommendations on the most suitable cabinet for you.

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Pre-treatment – the need for control

by Brian Carroll, BC Metal Finishing Services Ltd

In life in general, if something is under control it performs well. This is no different with metal pre-treatment process solutions; the better they are controlled, the more consistent the results.

In the past, when the majority of cleaners and lightweight iron phosphates were powder chemicals, automatic dosing was the exception rather than the rule. However, in recent years the trend has been to liquid chemical concentrates, which has resulted in the increased use of automatic dosing equipment.

Brian Carroll comments: "Having introduced automatic dosing equipment into many companies, we have not had one single complaint."

Automatic dosing can be effected in many ways: from a simple dosing pump to a fully integrated computerised system. Typical applications include:

Timed dosing

As the name implies, this is achieved by using dosing pumps which dose the chemicals on a predetermined time scale. The solution strengths are regularly checked and the timers adjusted.

Adjustable dosing

This is carried out by installing an adjustable dosing pump. This is set to administer chemical at a set rate. When the solution strength is checked, the rate can be altered by adjusting the speed control on the pump to cater for any change.

Proportional dosing

On solutions such as rust inhibitors, which do not show a significant pH or conductivity change, a pump can be fitted to the water

feed supply which will add chemical at a predetermined ratio. These installations require the regular use of manual input in order to make the adjustments and solution strength variations. However, this is better than chemical checks alone and small manual chemical additions are always better than one large shock addition.

Moving on from this are control systems that are fully automated and which require the use of conductivity or pH sensors to be fitted in the process solution. Process solutions on pre-treatment plants are normally controlled using conductivity. However, in some instances, pH control is required.

Conductivity control

This method of control measures the electrical resistance of the process solution and is known as electrodeless conductivity.

The system operates by immersing the dip cell in the process solution, which in turn sends a signal to the electrodeless conductivity controller. When the solution strength falls below the pretermind set point, the dosing pump is activated and supplies chemical until the process is back to strength. The control is very accurate and a digital display of the strength is shown on the control which operates around a narrow range above and below the set point, known as the hysteresis.

When used for rinse control, the units are set on a lower scale and when the set point is reached, this activates a solenoid valve which supplies the fresh water.

Electrodeless conductivity control is well practiced and proven within the pre-treatment industry, proving to be extremely reliable in service. The instrumentation is sound and the dip cells very robust, which after the initial calibration require little maintenance apart from regular cleaning of the contact area.

The units can be supplied as stand-alone or integrated into a fully controlled computer program.

pH control

The method is used on certain installations where the process solution does not show a conductivity change or where a visual display of the pH is required on a rinse



overflowing to foul sewer. Historically, it has been used on effluent treatment plants which rely on close pH control to drop out heavy metals and ensure the discharges to foul sewer are in the desired range.

This method operates in the same manner as conductivity control, whereby the dip cell is immersed in the process solution to monitor the solution strength. This obviously reads the pH of the bath and activates the pump of the solenoid valve in the case of rinse control when the set point is reached.

Although reliable, this method is not as robust in use as conductivity control. The dip cells are usually glass and are very delicate. The dip cells require calibrating on a regular basis and have a limited life.

In summary, conductivity control is the preferred choice and pH control should only be used when the application demands its use.

With all chemical solutions, regular titration testing should be carried out, regardless of the use of automatic dosing equipment. However, there is a case for a reduced checking frequency.

Automatic control and dosing facilitates supply in larger containers, eliminates handling, reduces chemical and water costs and above all gives accurate solution control with consistent results.

Over the last 20 years, BC Metal Finishing has gained valuable practical experience through the supply of many pre-treatment installations. As a specialist pre-treatment chemical supplier, we closely understand the specific needs of its customers. We also offer a range of pre-treatment equipment, from simple dosing pumps to state-of-the-art conductivity and pH controllers.

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Oerlikon and Hirtenberger Engineered Surfaces announce collaboration

Oerlikon AM, the additive manufacturing unit of global technology group Oerlikon, and Hirtenberger Engineered Services have entered into a strategic alliance to further industrialise series production and prototyped parts.

They began working together early this year to evaluate the Hirtisation Process, a post-processing technology for additive manufacturing that allows three-dimensional surface treatment, including the removal of support structures and automatization of the post-processing steps.

The Hirtisation Process is now proven to allow parts to be made that were previously unrealisable. With this knowledge, the two companies are intensifying their collaboration and have created a joint working group to explore how the process can be integrated into the AM value chain. The new process results in smoother surface textures. It also allows the production of complex parts that require interior support structures during production, but which need those structures removed after

completion, without impacting the integrity of the part.

The industries that can benefit most from this collaboration are those with complex parts, such as turbomachinery, oil and gas, automotive and general industry. Oerlikon AM will apply the technology in those industries first to help customers reduce part costs and achieve predicable and repeatable results.

Additionally, Oerlikon AM and Hirtenberger Engineered Surfaces are working on applying the Hirtisation Process to the prototyping business, which is expected to improve productivity by eliminating extra finishing steps.

“For Oerlikon AM, the Hirtisation Process addresses one of AM’s major challenges, which is to provide our customers with parts with more complex geometries, some of which are not possible nor economical with existing AM and post-processing technologies,” says Dr. Christian Haecker, head of Oerlikon AM Industrialization. “The process fits perfectly in our desire to offer customers services and



From left to right: Dr Wolfgang Hansal, managing director, Hirtenberger Engineered Surfaces and Dr Sven Hicken, Oerlikon, head of Additive Manufacturing Business Unit. (ULA copyright)

products along the entire value chain. We also see a benefit in increasing repeatability of defined AM surface quality.”

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In addition, Walther Trowal offer the possibility of an effective cleaning and recirculation of process water, thereby protecting the environment and saving costs.

Contact Walther Trowal for a [free](#), no obligation process trial with your parts.



WE IMPROVE SURFACES

"It ain't what you do, it's the way that you do it"

WTI Fasteners Ltd is a family owned and run business based in Ashby de la Zouch, Leicestershire, with over 30 years' experience in the fastener industry, over which time it has grown the business to become a leading manufacturer of wire thread inserts.

The company principally manufactures helically coiled wire thread inserts along with stocking associated taps, tooling and thread repair kits and hold AS/ EN 9100 accreditation. It supplies customers in over 30 different countries as part of its global supply chain, serving aerospace, automotive and an increasingly diverse range of business sectors.

Threaded inserts are cylindrical section wire formed into a helical coil and wound, by means of appropriate tooling, into a pre-tapped hole. The outer shell of the threaded insert allows it to lock in place once put in the hole and its inner cavity is threaded to allow for the insertion of fasteners. They provide a permanent thread resistant to wear and any effects of corrosion and are commonly used in the assembly of many consumer products, industrial mechanisms and electronic goods.

With the growth in demand for colour coded components, WTI developed its own system for applying coloured lacquers based upon a modified rotary drum industrial washing machine for coating inserts typically ranging in size between M3 to M8.

This expanded the WTI range and services offered and allowed the company to provide optional coloured components to meet customers' requirements.

However, over time, results were inconsistent and mechanical and general operational reliability was poor and the company decided to investigate what purpose designed equipment was available in the painting and coatings market.

One of the companies contacted was Walther Trowal, the manufacturer of a wide range of finishing equipment, including the Rotamat model coating machines which have been designed and developed specifically for the coating of small components.

A range of different sample inserts were provided for empirical process trial and the capability of the Rotamat machine was confirmed with uniform results being



achieved when applying blue, green and red lacquers on the range of samples supplied.

The Rotamat range of machines includes three models varying in capacity, size and sophistication with component usable volumes between two and 75 litres, thereby providing scope to meet wide ranging production requirements.

Following evaluation of production volumes and types of component to be coated, Andy Mason, director and co-owner of the company, purchased an R 60 model machine and confirms: "The Rotamat provides an innovative coating system that allows us to colour our inserts with optimum control and efficiency, with the fully automatic spraying system and rotating drum ensuring a uniform dye coating with repeatable, visually homogeneous results every time. Though specially designed to coat small components, the easily exchangeable drum sizes enable us to colour a variety of insert sizes in a range of quantities, meaning we can quickly adapt to our customer needs. The process is further streamlined due to integrated IR sensors, which carefully monitor and adjust the temperature providing efficient drying during the colouring process. This removes the need for further treatment, so we can

process and despatch dyed inserts faster than ever before."

"At WTI, we pride ourselves on adapting to new trends and developments within the fastenings market and that's why we've invested in a new state-of-the-art machine to keep up with the increasing demand for dyed inserts."

In summary, the Rotamat coating process is fully automatic. Labour intensive and time-consuming manual placing of the parts on special racks which is required in conventional coating systems is no longer necessary.

One or two automatic spray guns are used to evenly apply the coating materials whilst the components are simultaneously gently tumbled within the enclosed rotating spray chamber and in order to induce the required process temperature into the components, warm air is injected with an absolute minimum turbulence.

The component temperature is directly measured with an IR sensor and depending upon the work piece temperature a PID (Proportional Integral Derivative) controller regulates the temperature of the inlet air taking into account the actual air volume thereby providing continuous modulated control.

Rotamat machines are not limited to applying coloured lacquers and can provide an economic solution for improving the surface of many types of mass produced, delicate and complex shaped small parts made from elastomers, metal or wood with different coating materials. Typical applications are:

Lubricating coatings to reduce the coefficient of friction and prevent chatter and sticking effects on small parts like O-rings, sealing components or valve stems. It also facilitates problem free separation of the workpieces.

Application of bonding agents, single or double-layer systems consisting of primer and cover creating a strong bond between the substrate and elastomer.

Corrosion protection coating providing a long-lasting protective layer without the use of hazardous chemicals.

Coating for electrical insulation purposes using special coating materials to provide an insulating layer for electronic components like ferrite cores and rings or capacitor sleeves.

Decorative coatings using a wide range of decorative and functional coating materials,



eco-friendly, solvent-free lacquers and single or two component special lacquers.

Walther Trowal is the complete OEM, providing a wide range of equipment and process consumables designed and manufactured in house since 1931.

For more information and/or to arrange free of charge process trials upon sample components.

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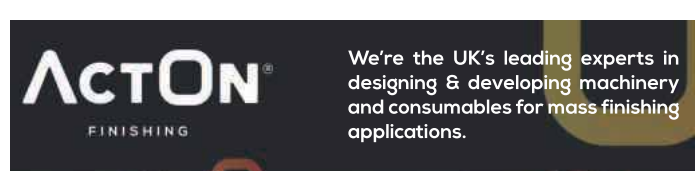
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New multi-pass heat exchanger improves heat transfer of viscous materials

The unique HRS R Series of scraped surface heat exchangers is well established for multi-tube scraped surface installations thanks to its ability to provide a large surface area with a very small footprint and the use of a helical scraper system. Now, the company has launched a new multi-pass version, the RMP Series, aimed at improving heat transfer for challenging viscous materials.

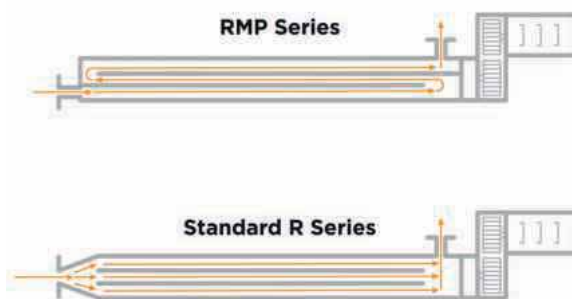
Available in single and multiple tube configurations, one of the most popular models in the standard R Series is the R3. Containing three tubes, it provides a greater heat transfer area and capacity within the same footprint as a single unit, as well as all the benefits of a single heat exchanger, such as a single set of connections to the product and services, plus the reliability and cost savings of a single drive assembly compared with multiple motors.

In its standard configuration, the product passes from a single-entry point through each of the three tubes in parallel before exiting the exchanger from a single port. This arrangement reduces the overall velocity of the product as it passes through the heat exchanger and prevents operation in a pure counter-current flow.

However, the new multi-pass arrangement, known as the RMP, now links each of the three tubes in series, the product enters through one tube, passes down the next and then moves back up the



A cutaway image of an R3 heat exchanger showing the parallel tubes, each with its own scraper



The new RMP Series passes material through each tube in order, rather than at the same time, to improve heat transfer while maintaining product velocity



Each R Series scraped surface heat exchanger includes multiple tubes powered by a single motor and gear system

third. The use of longitudinal baffles in the outer shell achieves a true counter-current flow to improve heat exchange efficiency, while maintaining product velocity helps reduce pressure drop and increases product mixing. Crucially, the RMP maintains the overall large surface area of a standard R3 system within a compact unit; one of the system's key benefits.

As the new layout has a consistent cross-sectional area, the risk of dilution and blending from cleaning-in-place (CIP) operations is greatly reduced compared to other large surface area heat exchangers. Flushing is therefore more efficient, enabling greater recovery of high value products without contamination or mixing, while the cleaning phase itself is also more effective due to the maintained velocity.

The new RMP Series is ideal for a range of challenging viscous materials, and is being deployed in a number of sectors, including viscous and starchy foods, such as thick sauces, pastes, creams and pet foods, for example.

Located in the UK, HRS Heat Exchangers is part of the HRS Group which operates at the forefront of thermal technology, offering innovative heat transfer solutions worldwide across a diverse range of industries. With almost 40 years' experience in the food and drink sector, specialising in the design and manufacture of an extensive range of turnkey systems and components, incorporating our corrugated tubular and scraped surface heat exchanger technology, HRS units are compliant with global design and industry standards. HRS has a network of offices throughout the world: Australia, New Zealand, UK, Spain, USA, Malaysia and India, with manufacturing plants in the UK, India and Spain.

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Russian manufacturer proceeds with Tenova new Hot Dip Galvanizing line

Tenova, a Techint Group company specialised in innovative solutions for the metals and mining industries, recently received the official notice to proceed with the new Hot Dip Galvanizing (HDG) line for NLMK Group, a leading international manufacturer of high-quality steel products, in Lipetsk, Russia.

The new line, with a yearly throughput of 450 kt/y, has the advantage to be able to process several input material and in particular interstitial free (IF) steel, high strength steel (HSS) and advanced high strength steel (AHSS) that allow NLMK to strengthen its market share in the automotive applications.

The new state-of-the-art HDG line includes a hybrid furnace, which combines a horizontal heating portion with a vertical heat treatment and close cooling chamber, to achieve flexibility with the most severe

strip annealing recipes, in addition to a new skin pass and tension leveller section required by multiphase steel grades. A new On-Line Level 2 Mathematical Model will also guarantee constant high quality across different production scenarios.

“As Tenova Metals, the co-operation over the years with NLMK was always based on the mutual recognition of reliability and trust” says Roberto Pancaldi, Tenova Metals CEO. “This new HDG line is the proof of this and I am particularly proud that Tenova is participating in this new project.”

Tenova, a Techint Group company, is a worldwide partner for innovative, reliable and sustainable solutions in metals and mining. Leveraging a workforce of over



2,500 forward-thinking professionals located in 19 countries across five continents, Tenova designs technologies and develops services that help companies reduce costs, save energy, limit environmental impact and improve working conditions.

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Do you need high-quality compressed air fast?

Hi-line Industries, a leading UK supplier to the compressed air sector, has a solution for all companies seeking a temporary way of delivering high-quality, dry compressed air. An affordable and responsive rental scheme is now in place at the company, covering Hi-line's comprehensive range of class leading compressed air dryers.

Although hiring a compressor is easy enough for short-batch emergency runs or exceptionally busy periods, finding specialist drying equipment is not so straightforward and yet air quality is just as important in temporary periods as it is during long-term regular operations.

Hi-line overcomes this issue by offering hire options on a vast range of compressed air dryers, including refrigerant, heatless, heat-regenerative and point-of-use models. High-quality, competitive filtration packs can also be provided.

The company's market-leading Tundra refrigerant air dryers, for example, are renowned for their robust and reliable performance. Moreover, the newly improved single-cell heat exchanger gives

the most efficient transfer of heat at the lowest energy cost.

For those seeking heatless dryers, Hi-line can offer its proven HPSA (Heatless Pressure Swing Adsorption) units, which come in 'plug and play' format mounted on skids with their own filtration package as standard. Class-leading performance is assured with HPSA range, as it is with Hi-line's series of heat-regenerative adsorption dryers, as well as its point-of-use desiccant adsorbers. The latter are ideal for the small-scale separation of humidity from compressed air systems.

From as little as £50 per week, Hi-line can supply from a huge stock of ready-to-go compressed air dryers, including Class O, Class 4 (+3°C PDP) and standard -40°C PDP desiccant units. Offering capacity from 5 to 5,000 cfm, both short and long-term hire requirements can be fulfilled.

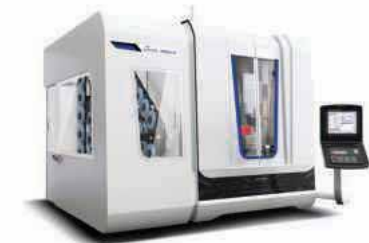
Importantly, control packages are available to suit every application, including heatless, heat regenerative, pneumatic, 24V, 240V, dewpoint and AEMS (automatic energy management systems).



Tundra refrigerant air dryers are renowned for their robust and reliable performance and are available for hire from Hi-line Industries Ltd

Regardless of what type of dryer is required, delivery to site includes set-up by a fully qualified Hi line compressed air engineer, providing both convenience and peace of mind. If desired, a smart controller can be added to all makes of dryer as an energy-saving option, while N2 and O2 generators are also available.

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