GRINDING & SURFACE FINISHING

APRIL 2023

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GRINDING & SURFACE FINISHING

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Contents

Features: June 2023

- Automotive Report
- Automation
- Deburring
- Dust & Fume Extraction
- Honing & Bore Finishing

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Synonymous with precision, quality and durability

Leading technology from Studer

Faster, more accurate, and more cost-efficient machining is only one of the advantages of automating grinding processes. Factors such as a higher safety for the operators and their health also play a large role. Studer is therefore one of the technology leaders in this field.

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 25,000 delivered systems, Studer has been synonymous with precision, quality and durability for decades. Its former pioneering spirit is also reflected in its present-day products, and is impressively demonstrated by the quality and quantity of its innovations. Since 1994, Studer has been part of the United Grinding Group. It offers fully automatic grinding systems, including loaders, measuring systems and special clamping systems, from many different manufacturers.

The name Studer stands for hardware, software, system integration and Swiss quality service. With a customised complete solution for each grinding task, the customer also receives the company's knowledge and know-how about the grinding process. The Studer logo has been a seal of quality for first-class results for decades. The company ensures that the art of grinding remains closely linked to its name in the future. It has 110 years of experience in the development and manufacture of precision cylindrical grinding machines. Its training centre offers training for customers and representatives on all Studer products in at least four languages.

Studer is a comprehensive service provider with around 100 staff, active in Switzerland, Germany, France, Italy, Great Britain, Turkey, Japan and China.

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The micron is at the service of health

By Claudio Tacchella

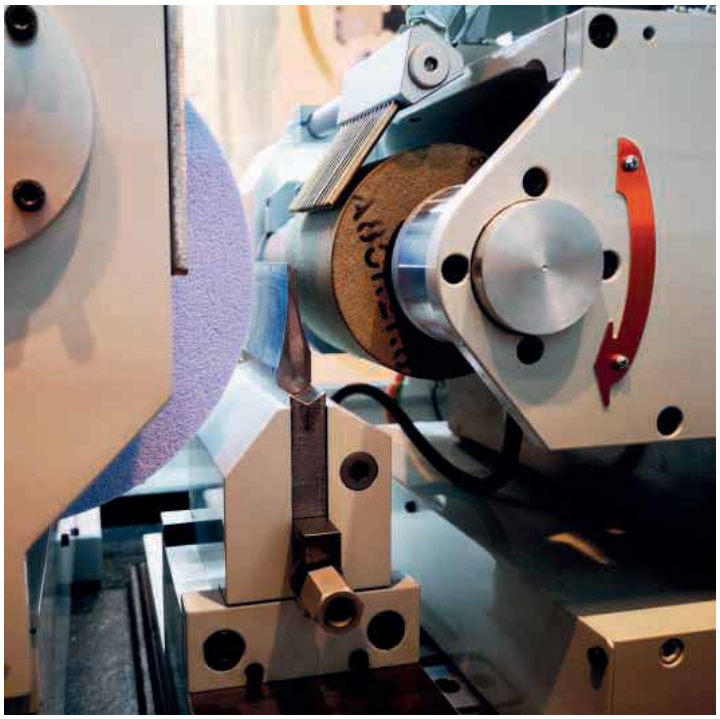
Hand in hand with the constant population growth, the longer life expectancy, the improved well-being and the technological progress, the medical technology field is also experiencing an expansion estimated to be more than five percent per year. Moreover the awareness at global level of the importance of health inevitably triggered an ever more solid expansion of the healthcare industry, which has to satisfy a growing demand for medical devices which represent the top priority for manufacturers of medical products.

In this context, the increase in production capacity, the constant developments in the pharmaceutical, medical engineering, orthopedics and surgical instruments field as a whole, make the medical branch one of the most important outlet markets for the Italian manufacturer Rettificatrici Ghiringhelli SpA with its headquarters in Luino (VA).

Marco Barzaghi, sales manager of Rettificatrici Ghiringhelli states: "Most of the components of the instruments used in the medical field require intense work by the resources employed in Research & Development (R&D), with increasingly sophisticated articles and materials used. These are complex parts which call for cutting-edge machine technologies that can achieve and guarantee a high level of precision of the profiles, a degree of surface finish and a reliability of the process.

These technologies often lead back to grinding processes. Among the numerous players in the medical engineering field, our company has a high reputation thanks to the technological level of our centreless grinding machines that we offer to that sector."

The medical branch is one of the most important outlet markets for the Rettificatrici Ghiringhelli



The new Ghiringhelli A80 centreless grinding machine with fixed centre has perfect technical features for very small parts

The experience gained by Ghiringhelli in the medical sector dates back to the early 80s, with active participation to the technology development which is the foundation of the injection needle called PIC®, or the "Indolor™ Experience" (painless technology).

This innovation originates from the cannula which, thanks to its particular triple sharpening, designed to increase the penetrability of the needle, reduces the strength necessary for the needle to penetrate the skin, thus reducing the pain of the injection itself. In the following years, Ghiringhelli developed many solutions for the medical sector with numerous international companies. Among these, the supply of systems for the centreless grinding of special punches used in the production of pharmaceutical pills. Ghiringhelli's approach to the medical sector is similar to the approach of other sectors, i.e. everything always originates from the specific request of the customer to create co-engineering, customised and "turnkey" solutions.

Marco Barzaghi says: "Among the many requests we are receiving, there is an interesting order, for example, that is being finalised for an important Swiss company, a manufacturer of

medical devices used both for dental implantology and for orthopedics. The customer needs a fully automated and perfectly integrated solution according to Industry 4.0, which can cope with the increases of the production volumes of hardened stainless steel milling-cutters, 52-56 HRC, used for the shaping of dental implants. We are talking about significant production volumes, which concern some hundreds of thousands of pieces divided into different types for a range of tools to be ground which have lengths from 22 to 40 mm for a diameter of 2.5 mm.

"Thanks to our consolidated experience and our recognised problem solving skills, we were able to satisfy this need. In particular, to combine the concepts of reliability and the very high precision of the machine with the maximum flexible automation of the production process, we chose to customise our new centreless grinding machine called A80. The machine has been configurated to perform plunge grinding operations of one or two pieces per cycle. Especially, the solution to grind and handle different types of parts in a single machine was the integration of a specific interlocking system according to the type of milling-cutter to be ground and the production batch to be made.

Rettificatrici Ghiringhelli developed many solutions for the medical field with several international companies

All the tools are transported to the machine via a motorised shuttle and, from here, a small loader picks one or two pieces per cycle according to the length and transfers them to the working position. After the grinding cycle, the unloading step, for most of the pieces, takes place on a motorised belt placed under the wheels, with the exception of a type of milling-cutters, for which the customer has requested to reposition them on the shuttle and pick them up from an anthropomorphic robot that distributes them on special trays."

The new A80 centreless grinding machine with fixed centre is conceived with six CNC axes on a natural granite machine bed

Marco Barzaghi continues: "As far as feeding is concerned, we are working with the customer to choose four different solutions according to the type of piece to be ground that is: via circular hopper, hopper feeder, robotic isle with a tray with raw pieces and a tray with finished pieces and, finally, semi-automatic machine feeding through manual introduction of small parts in total security. The system provides an integration of a post-process measuring unit of the customer. Considering the important and delicate use of the medical devices manufactured by the customer, we can say that we have succeeded in configuring the proposal for an efficient, automated, 100 percent safe integrated grinding system and that we have fully satisfied it."

In general the new Ghiringhelli A80 centreless grinding machine with Fixed Centre (FC) has perfect technical features. The machine can grind pieces from Ø 0.3 mm up to Ø 10 mm for lengths up to 80 mm, both plunge and throughfeed. The A80 is conceived with six CNC axes on a natural granite machine bed. The grinding wheel head mounts wheels of Ø 200 mm x L 80 mm, 4 kW motor power, operating at a constant peripheral speed up to 50 m/s (63 m/s optional). The control wheel head mounts wheels of Ø 100 mm x L 80 mm. The control wheel head can be tilted by +/- 5°.

All the software functions, automation included, are integrated into the CNC through the exclusive Ghiringhelli HMI interface.

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Partnership provides excellent finish for deep-drawn medical components

Deep-drawn functional components are increasingly being utilised in the production of medical and pharmaceutical products. To meet the strict standards for manufacturing and quality management in the field of surface finishing, Hubert Stüken GmbH & Co. KG has relied on mass finishing solutions and consumables from Rösler for more than 30 years.

Founded in 1931, Hubert Stüken GmbH & Co. KG is a family-owned business with manufacturing operations at five locations in Europe, Asia and the United States. Its product range includes stamped and bent parts, plastic-coated components and complex assemblies.

Rösler works with Stüken Medical, the company's medical business division which focuses on medical and pharmaceutical engineering, to meet the increasing demand for deep-drawn metal components.

Andreas Hellman, manager of the ISO 13485-certified business division, explains: "Components used in the field of medical and pharmaceutical engineering must meet strict quality standards. The same strict standards apply also to the actual production operations. For this reason, we have pooled the required know-how for the development and production of such precision components at Stüken Medical."

The situation

Among other items, this division produces complex housings and assemblies, valves, extremely precise micro parts and primary packaging. These components are made from metals suitable for deep drawing, including stainless steel, aluminium and titanium.

To meet the strict quality standards in the medical and pharmaceutical industry, the company utilises multi-stage cleaning systems and operates two class seven cleanrooms. Its research and development department, located at the corporate headquarters in Rinteln, Germany, continuously explores the possibilities to expand the range of processes and materials.

"For many of our customers, we are a development partner," Andreas Hellmann explains. "To perfectly adapt new products to their intended use, we are not only working with our customers but are also cooperating with partners from various technological sectors."

The solution

When it comes to issues around surface finishing that can be resolved by mass finishing, the company has relied on Rosler's experience and know-how for more than 30 years.

"Our long partnership is based on the excellent quality and reliability of Rösler equipment and consumables,"Andreas Hellmann continues. "This helps us to ensure that the required results are achieved in a consistent manner."

Dirk Schulz, project engineer at Stüken, agrees: "When it comes to the joint development of finishing processes, we especially value Rosler's flexibility and expertise. In this respect, our access to the Customer Experience Centre in Untermerzbach is extremely valuable.

"Rosler also supports us with documentation and equipment details required for machinery and processes that must be qualified and validated in line with ISO 13485."

At its manufacturing locations around the world, this deep-drawing specialist uses 15 rotary vibrators and 10 centrifugal disk finishing machines for its finishing operations. Stüken Medical also operates 18 process water centrifuges for eco-friendly and reliable cleaning and recycling of the process water.

Rotary vibratory machine with workpieces in the media mix

The requirements

The deep-drawn components are generally characterised by an extensive degree of material shaping, complex geometries and extremely small dimensions requiring high dimensional accuracy and especially demanding specifications for deburring, edge radiusing, and polishing of external and internal workpiece areas. Equally challenging are the surface roughness and surface quality requirements.

"On the one hand, we must ensure that all pieces within a workpiece batch receive the same high-quality surface finish. On the other hand, the workpieces must not be damaged or deformed," Dirk Schulz says.

"Last but not least, after completion of the finishing process, the workpieces and media must be reliably separated. A carry-over of the workpieces and/or media into the next batch must be prevented at all costs."

In conjunction with polishing jobs, the workpiece surface must frequently be marked with a UDI code. Fully meeting these specifications requires finishing processes that are precisely tailored to the respective workpieces as well as carefully adapted equipment and consumables. Conducting special feasibility studies is often required to determine system parameters.

Deep drawn component made by Stüken

The process for radiusing the edges of 0.8 in, 20 mm stainless steel housings for a medical device was developed in close cooperation with Stüken.

This delicate housing's large surface area in combination with extremely thin walls posed a challenge. To remove sufficient material at the edges, a high processing intensity that could be tightly controlled was required to prevent any deformation.

The cooperation

The Customer Experience Centre at Rosler is equipped with ultra-modern machines capable of running a wide variety of different finishing processes and conducting trials to define the most suitable equipment technology under actual production conditions. During such development processes, the processing bowl of standard machines must be frequently modified, sometimes involving substantial engineering changes.

For this project, the comprehensive mass finishing experience at Stüken was a valuable source of ideas. To guarantee a reliable and complete separation of the finished workpieces from the media, the finishing equipment for Stüken Medical required a few changes in the separation process. Another goal of processing trials is the determination of the optimal media shape and type, ceramic or plastic, for the finishing task at hand. In order to achieve consistently good surface finishes, very often the media must have extremely tight dimensional tolerances.

All ceramic and plastic media are produced at Rösler in compliance with the highest ecological standards. With over 15,000 different products, the media, compounds and process water cleaning agents Rösler offers are by far the largest range of mass finishing consumables in the world.

A key factor in the development of successful finishing processes is the perfect interplay between the right equipment technology and the right consumables, media and compound. Generally, the best results are achieved by close cooperation with the customer.

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A long history of innovation

Founded in 1952 by Miner Gleason and Robert Barhorst, Glebar was established to manufacture machine tools based on the principles of centreless grinding. Located in Ramsey in Northern New Jersey, USA, its expertise in manufacturing has supplied its customers with custom solutions incorporating the latest technology and produced equipment that provides an efficient and controlled manufacturing process.

Over half a century in operation, Glebar has helped customers to drastically improve throughput, while enhancing the quality of their products and the efficiency of their operations. Glebar's innovations have replaced alternative technologies such as lathes, OD grinders and Blanchard grinders, with precision, high-volume production turnkey systems. It collaborates with customers to integrate its systems into their processes and effectively streamline their production. Over the years, Glebar has designed and manufactured an array of machine tools for its customers: centreless grinders, electrochemical cut off and grinding machines, form grinders, gauging systems dressing machines and other micro grinding systems.

Glebar machines do much more than just grind, they provide a complete solution. Starting with modular machine platforms, it can design and configure its centreless grinding and gauging solutions with differentiated customisation. Its systems can be fully automated, fitted with robots, cleaning and drying stations, feeders, packaging, conveyors, eddy current systems and quality control features to provide a truly hands-off, turnkey solution for grinding applications that demand ultimate precision.

The Glebar CAM.2 Micro Grinder is the perfect machine for grinding small, complex, precision medical applications such as complex medical guidewires, radiuses, needle points, and non-linear shapes. Previously unproduceable parts can be made easily, with minimal setup time and with limited operator training. Glebar's patented dual-carriage linear motor part feed system ensures that the position, speed and rotation are under absolute control at all times controlling the grind with a high degree of diameter and length accuracy.

The Glebar GT-9AC Automated Guidewire Grinder excels at precision grinding of medical guidewires with multiple tapers, paddles and parabolic shapes with speeds as fast as a centreless grinder. Instead of using sensors to detect the wire position and trigger diameter changes, high-speed imaging technology and a 1-micron encoder run the entire length of the feeder providing constant updates displayed on the touchscreen HMI allowing for quick, simple adjustments. The result is crisp, clear tapers and virtually no limit to the number of tapers, paddles and parabolic shapes which can be ground.

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From left to right Studer: COO - Stephan Stoll, CEO - Jens Bleher , CSO - Sandro Bottazzo and CTO - Daniel Huber

Studer Motion meeting 2023

At this year's Fritz Studer AG press conference, CEO Jens Bleher welcomed press representatives to a historic site: "Exactly 111 years ago, Fritz Studer founded his company here in Steffisburg. Since then, the pioneer in cylindrical grinding has presented countless technological innovations; a long tradition that that is our obligation for the future." We are therefore particularly pleased that Studer succeeded in continuing its growth course in 2022 and significantly increased sales. After a remarkable final spurt at the end of the year, Studer started 2023 in full momentum with a large order backlog."

Positive development of the order situation

"Overall, it was the third-best year in our company history in order intake," said CSO Sandro Bottazzo. Expectations were exceeded by far in all sales regions. Some countries, such as Turkey, even recorded the highest order intake in company history. As a global manufacturer of high-precision grinding machines, Studer is active worldwide. "All in all, in 2022, we once again succeeded in expanding our position in the most important markets in the world and increasing our market share."

"In 2022, almost all markets showed growth in orders. New customers were responsible for 37 percent of the orders. Furthermore, December was the second-best individual month in our history. The aerospace and energy segments significantly contributed to this positive development. The tooling, die and mould and machine manufacturing segments remained stable at a very high level. The precision engineering segment with the small and medium-sized supplier companies and contract manufacturers remains our largest individual segment. In the automotive sector, on the other hand, there was a decline, which specifically affected demand for production machines. "However, our good positioning and broad portfolio are helping us greatly," emphasised Sandro Bottazzo.

Broad portfolio as key to success

A broad portfolio that can fulfill a wide variety of customer requirements is both our trademark and an important pillar for Studers' success. In the 2022 business year, universal and internal cylindrical grinding machines showed a positive trend, in both the standard and system business. The bestseller among the Studer machines was once again the versatile S33 CNC universal cylindrical grinding machine, which is capable of producing small and large workpieces in both single and series production. Other machines that sold very well were the favorit, the S31 and the S41. In the sales of internal cylindrical grinding machines, Studer achieved its second-best annual result ever. Another area that reached a record high was the WireDress® technology, which enables the precise dressing of metal-bonded grinding wheels possible and thus boosts productivity to extremely high levels.

Customer care with record sales

Sandro Bottazzo has more good news from the area of customer care. Here, Studer achieved a new revenue record in 2022: "All business areas did very well, with service, maintenance and individual business all setting new records. In overhauling, it was the second-best year in our company history," he says. Because of good business development, Studer has further expanded its service organisation. Customers thus profit from even better availability and faster problem-solving. Additionally, numerous business processes have been digitised and optimised. "We will continue to grow our Customer Care to provide even better performance and to be closer to our customers," announced Sandro Bottazzo.


Studer Motion meeting 2023 - suprise night

Development of numerous new products

The 2022 business year also brought numerous new developments and an expanded product range. "With our product offensive, innovative and application-specific solutions, we can even better address the needs of our customers," said Daniel Huber, CTO at Studer. On the China market, on the one hand, the new generation of the well-proved KC33 CNC universal cylindrical grinding machine, was presented. On the other hand, with the ecoGrinder, Chinese customers now have an economical entry-level solution available and it has already found numerous buyers.

"In 2022, we presented an innovation at almost every large trade show," Daniel Huber continued. "This includes the S36 production machine at GrindingHub in Stuttgart. It closes a gap in the portfolio between the S11 and S22 and is particularly well-suited to applications and components in the field of electromobility. Now the S36 is also available with an innovative energy monitoring concept. Or there's the new S100 that was presented at the BIMU in Milan, a perfect entry-level option in the field of CNC universal internal cylindrical grinding machines.

More machines with C.O.R.E.

The revolutionary and cross-brand hardware and software architecture of the UNITED GRINDING Group can also be found on an ever-increasing number of machines. C.O.R.E. offers smart networking of several machines, freely configurable and user-friendly operation, and latest generation contact sensors. C.O.R.E. also features a modern, large-scale multitouch display with intuitive operation and numerous visualisation options for more efficient production.

In 2022, Studer was already able to convert four machine types to C.O.R.E. and will continue the rollout on the internal cylindrical grinding machines in the coming year. "Only manufacturers that offer intelligent machines with intuitive operation, digital assistance and monitoring systems, automation options, as well as efficient process management will be successful in the future," said Daniel Huber.

Challenges in the supply chains

The supply chain situation remains an important topic in 2022. CEO Jens Bleher noted: "Despite the tense situation in the procurement markets, our operations team and engineering jointly succeeded in producing reliably and continued to provide very competitive and reliable delivery times." COO Stephan Stoll explains: "Our strategy of keeping our production resources at a stable level even during difficult phases was as much part of this success as the long-term partnerships we have enjoyed with our supplier base." Studer also profited from the risk-based supply chain approach that it has been following for several years to minimise single-source dependencies wherever possible. Here, another success factor was the close collaboration between engineering and purchasing who were able to evaluate alternative components well, in time, when bottlenecks seemed imminent.

Investment in the future

Regular and systematic investments in all areas of the company are part of Studer's company philosophy. "We are convinced that this will keep our locations competitive and that Studer machines 'Made in Switzerland' will have a strong foothold on the world market in the long term," explained Stephan Stoll. Following the redesign and modernisation of assembly, the focus was on manufacturing over the past few years. In 2022, several projects contributed to ensuring that the production resources remain state-of-the-art, with a special focus on automation and digitisation. In the coming year, spindle shaft production will be renewed and expanded and the warehouse and logistics infrastructure comprehensively modernised by 2025.

Training and attractive career changes

Vocational training and career opportunities can also be improved through investments. "Modern workstations and top-level vocational training ensure that we remain attractive as an employer and can recruit the best talents and top employees, even in times with a shortage of skilled labour," says Stephan Stoll.

Studer provides in-house vocational training to qualify its skilled workers and offers them attractive career and professional development opportunities. CEO Jens Bleher emphasised the importance of well-trained employees for a technology company: "Studer kept its vocational training program running fully at all times. Trainees account for more than 11 percent of the workforce. We take this into account by investing in the latest generation of CNC machines for the training workshop, as we also did in previous years."

The management was also particularly pleased about the successes at the World Skills competitions. After winning the gold medal at the SwissSkills and the silver medal at the EuroSkills competition, polymechanic Gil Beutler crowned his excellent performance with a bronze medal at the WorldSkills in Canada. CEO Jens Bleher said: "We are very happy about Gil's successes and view his top placements on an international level as a confirmation of the consistently excellent work of our entire vocational training team over many years."

The seventh edition of the "Fritz Studer Award"

The "Fritz Studer Award" is another way the company promotes the best talents and innovative ideas. The research award comes with a prize of CHF 10,000 and will be hosted for the seventh time this year. It is aimed at students of European universities and technical colleges. Submissions are invited from areas such as: innovative machine concepts, digital solutions for supporting the grinding process, or alternative materials. Participants can enter either their individual work or team projects.

Grinding requires smart automation

Faster, more accurate and more cost-efficient machining is only one of the advantages of automating grinding processes. Factors such as a higher safety for the operators and their health also play a large role. Studer is one of the technology leaders in this field.

"There are still a lot of prejudices about automation in grinding," says Daniel Schafroth, systems division manager at Studer. "There are frequently concerns that people or jobs could become redundant. However, for us at Studer, the opposite holds true: Automation should enable the human operators to do their work more easily, efficiently and safely." Additionally, the special requirement of grinding necessitates that automation is used very wisely and selectively not every solution used in the industry is suitable for this. What are the important factors?

"For grinding, it is particularly important that processes are performed repeatedly in the same way, with high precision and reliability, for example clamping workpieces and aligning them correctly with micrometer accuracy," explains Daniel Schafroth. Automatic solutions for multi-machine operation are also relevant, as these can greatly relieve the workload of the operators, who then only have to fill magazines and no longer need to laboriously load each machine. However, grinding fundamentally requires the operators to have a high level of competence and automation should not be something that hinders them," says Daniel Schafroth: "Automation only makes sense where the operator doesn't have to have a decisive influence on the process."

Small companies profit from easyLoad

If correctly used, automation can be a real game changer for grinding companies regardless of whether it is a small business or a large company with several systems. "Where grinding machines are concerned, automation pays off for all sizes of companies," emphasises Daniel Schafroth. This may mean that a small workshop with only a few employees can fill the grinding machine in the morning and let it work autonomously for extended periods while the employees take care of other things, such as writing quotations. For example, the easyLoad loading system for external and universal cylindrical grinding machines,

STUDER S31 with new uniLoad loading system

Adjustable synchronised chain with prism supports for up to 50 workpieces

Detailed view of uniLoad NC gripper head

S31, S33, S22 and S41, which offers excellent value for money, including integration in the machine control, is explicitly also aimed at small companies.

easyLoad is suitable for use as a gantry loading system for shaft parts with a workpiece length of up to 300 mm, 11.8", a diameter of up to 30 mm, 1.18 and interfering contour diameters of max. 50 mm, 1.97. The adjustable synchronised conveyor allows autonomous processing of max. 50 workpieces. The standard gripper is designed for individual parts, the V-gripper for two parts and the heavy-duty gripper for workpieces that weigh more than five kgs, 11 lbs. The changeover time is only around six seconds. This enables the machine to run autonomously for half an hour or longer with ease.

ecoLoad and uniLoad increase production

Studerhas also developed optimal automation solutions for larger-volume series production. "Small companies mainly benefit from the universal and flexible systems, whereas speed and precision are the important factors in the production of large quantities," explains Daniel Schafroth. Here, good automation concepts can produce a large number of high-quality workpieces and make the most of every second. The ecoLoad for the STUDER S22 production platform is an automatic loading system for series production using high-speed grinding, production-oriented cylindrical grinding, as well as form and thread grinding.

ecoLoad can load workpieces with a diameter of up to 50 mm, 1.97, with a length of 250 mm, 9.85. This is either done using a carousel magazine or an insertion prism, which can also be used as the interface for standalone tool magazines. The programming is already integrated into the grinding machine control. This ensures short retooling times.

The uniLoad automatic loading system also makes it possible for operators of the STUDER S31 and S33 external cylindrical grinding machines to significantly increase productivity without any loss of quality. The system docks to the machine from the left.

With a prismatic conveyor and all racks at full capacity, it can perform automatic processing for around an hour.

It is suitable for workpieces with a length of up to 350 mm, 13.8 and 100 mm, 3.94 diameter and thus covers a large range of the parts normally produced on these machines.

Automation when space is tight

Solutions for applications with limited space are another important trend in the automation of grinding. "In modern production halls, it is of particular importance to make efficient use of the space," explains Daniel Schafroth. This is another topic where Studer is a trail-blazer, for example with the smartLoad for the S11, a production cylindrical grinding machine for small workpieces which has a footprint of only 1.8 sq metres, 19.4 sq ft. The smartLoad unit is also compact and can feed in workpieces from outside the machine, using either a conveyor or a swiveling unit, as well as clamp them and place them back after the machining. Thanks to the wide variety of configuration options, numerous applications are possible for both small and large-volume series.

In the past, radius internal cylindrical grinding machines, which are used in the manufacturing of drawing dies, for example, have been particularly difficult to automate due to the limited space available. One reason for this is the restricted enclosure geometry resulting from the high workhead. Studer has now developed an optimal solution for this as well: roboLoad. This external loader for the S121, S131 and S141 is designed as a gripper arm with quick-change jaws and has a lot of space for workpieces on six trays, each 1,080 x 320 mm, 42,5 x 12.6. At 1.50 m, the system is only half the width of the machine itself.

"With the robot arm outside the machine, we gain a lot more freedom thanks to the rotation axis and the roboLoad can get in for loading and unloading without having a direct path available," says Daniel Schafroth. Until now, automation solutions for grinding were largely based on linear technology such as beams and slides. However, at the moment the roboLoad is not primarily intended for large series production, but more for automated production during night shifts or extended breaks. Daniel Schafroth is sure that the trend toward using robotic arms in grinding will persist. "Neither us or our customers want to relinquish this new freedom."

STUDER S131 Radius internal cylindrical grinding machine with roboLoad loading system

STUDER S22 with ecoLoad loading system on the right

Loading and unloading situation with STUDER roboLoad

Automation is digital as well

This freedom includes easy and intuitive operation, a special USP of roboLoad and the other Studer concepts. "The grinding machine operators do not need any programming skills to perform the setup. It can be done easily and quickly within a matter of minutes," says Daniel Schafroth. For him, automation in grinding means more than just physical machine support. It is equally important to have digital assistance, such as that offered by the Studer grinding software and, in particular, C.O.R.E., the revolutionary new cross-brand hardware and software architecture of the UNITED GRINDING Group.

On the large C.O.R.E. touch display with intuitive icons, the operators can quickly find what they need and important information regarding the machining process is displayed. RFID access chips can be used to let the machine only display the options and information for which the individual users are qualified. "This prevents unqualified employees from making changes that could cause an error or a crash," explains Daniel Schafroth. With applications of UNITED GRINDING Digital Solutions™, efficient remote monitoring of the machines is possible even today. In the future machines will monitor themselves for optimal functioning and pro-actively provide information on required maintenance measures.

The possibilities for automation in grinding are therefore very diverse and offer large advantages on different levels. However, as Daniel Schafroth emphasises, the focus must always remain on people. "Something that is frequently overlooked regarding this topic is that automation also protects the safety and health of the workers." Robots can not only help with lifting heavy loads and performing repetitive, boring tasks but also handle a wide range of different materials without problems. This makes the workplace a lot safer and more comfortable.

Daniel Schafroth says that he is happy that the prejudices regarding the topic are decreasing and that automation solutions are becoming more and more frequent in grinding. He adds: "Because the best machine technology in the world is useless if it is not accepted by the people."

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Muffett gets in gear with Kellenberger

There are very few manufacturers with the heritage of Muffett Engineering Solutions, a company founded in 1920 by Stanley Herbert Muffett. Operating as a general machine shop, it wasn't until the 1950s that he turned to the production of precision gears. Now, the modern face of the business is very different to the company that started over 100 years ago and evidence of this can be seen with the latest acquisition the company has made in a Kellenberger 100 grinding centre with a Wenger autoloader from DF Precision Machinery.

Muffett manufactures and assembles special gears, mechanisms and gearboxes that are produced to the exacting requirements of its high-profile clients in industries as diverse as aerospace, marine, medical and automotive through to construction and the offshore sector. Producing gears from 4 to 400 mm PCD with a module from 0.25 to 5, the Tunbridge Wells company required ground gear components with a specific dimensional range and output rate, it was the Kellenberger 100 with Wenger autoloader that fitted the bill perfectly.

Mark Jagelman from Muffett Engineering says: "Mike from DF Precision Machinery was given a brief of what we expected and what we were looking for. Automation was a primary requirement, so Mike took us to several end users of Kellenberger machines with automated solutions. We also had trial parts manufactured before taking receipt of the machine."

Looking at specific parts and the challenges facing Muffett with its existing machines, Mark Jagelman adds: "With a small part, you can be grinding three diameters with two journals on the end and with the previous process, we had to drive the part with a carrier, which resulted in two operations. With the new Kellenberger machine, we have synchronous drives, so we can grind the part complete in one operation and we also have the automation factor as well."

Considering the 2-op process of grinding precision gears, parts had to be re-set to exact dimensions to complete the second operation. This was a time-consuming and laborious process that had the potential for error. Alluding to this and how the new Kellenberger machine has helped, Mark Jagelman adds: "You have one loading and one datum, so you have no issues with concentricity or run out." This is where the driven tailstock that is fully synchronised with the main spindle supports the process.

The Kellenberger 100 universal CNC OD/ID grinding machine is a new, high-performance and economical grinder for use across medium to large-scale universal grinding applications. The Swiss-Made Kellenberger 100 is highly configurable and offers a plethora of industry-leading options to accommodate the widest range of universal grinding operations across a variety of industry sectors. From a specification perspective, the machine has the choice of a universal work head, a work head with direct drive and C-axis, chuck loading, power clamping or the option of loading between centres.

The machine also incorporates a 19-inch LCD touchscreen monitor with the FANUC 31i CNC system, FEM optimised cast machine bed and mechanical separation of machine and peripherals for thermal stability and vibration damping. There is a range of tailstock options, a modular wheel head configuration that allows 10 different wheel head variants with up to 3 tool positions and a host of other solutions that can be specified by the end user to create the most suitable solution for their business.

Mark jagelman adds: "The new machine has improved our throughput, improved our capacity and it has improved our ability to run unmanned without any labour input."

Looking at the learning curve and implementation of the new Kellenberger 100 with Wenger autoloader, Theo Marks from Muffett Engineering says: "In principle, it is similar to before where we have the same tools doing the same process. The programming was a little bit more challenging than the old grinding machines, but the training we received from Kellenberger made it all quite straight-forward. It was great. We went over to the Kellenberger headquarters in St Galen in Switzerland and we had excellent training from the staff there. There is so much you can do on this machine, the machine is excellent."

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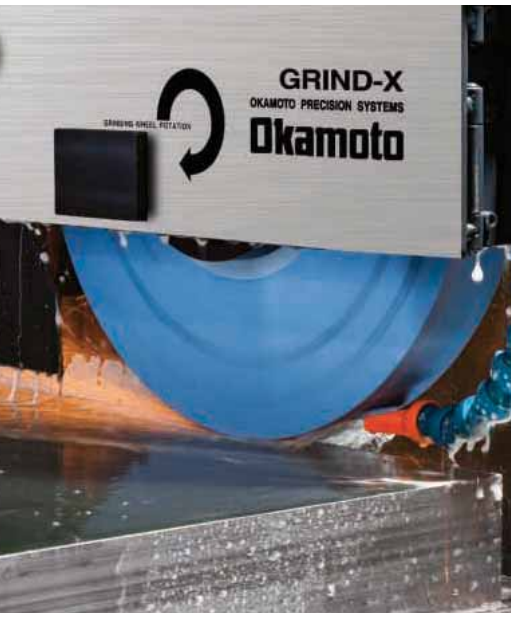

DF Precision Machinery Ltd is not only the official global supplier of Jones & Shipman spares, service and support, holding the OEM records & software and the largest J&S spare parts stock in the world. DF also supply proven solutions from individual machines through to turnkey cells from world renowned suppliers of Cylindrical, Universal, Surface, Profile, Vertical, Rotary, Internal, Creepfeed, Jig Grinding, Polishing & more.

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Reduced manufacturing process time thanks to new hybrid solution

Customers can now achieve faster processing times, thanks to the hybrid milling/grinding capabilities available on the milling machine series Mikron MILL S/X (U). The machines in this series are now able to combine milling and jig grinding on the same machine without any impact on its footprint or its performance.

On the customers' side, the manufacturing process is crucial to answer market demands and fast time to market is a daily challenge in many industries. Due to the crisis caused by COVID-19, the cost of raw materials has increased considerably and producing the first part right is essential in order to keep costs down and avoid scratch material. A short machining process is key to increasing productivity and efficiency.

The Mikron MILL S/X (U) 3 and 5-axis milling series is renowned for its accuracy, precision and high dynamics as well as for its iconic design and ergonomics. Accessibility to the machine is easy and the machine footprint is small, whether on a standalone machine or combined with an automation cell. With a fast process speed, parts can be produced in the highest quality to fulfil market demands with a flexible production. The Automated Machine Calibration (AMC) as standard on the series provides a perfect calibration and the cooling of all machine components keeps the process stable during long milling and grinding processes.

The Mikron MILL S/X (U) series now combine milling and grinding to reach high-quality parts and excellent surface quality in a reduced manufacturing process

The MILL S and X series now include hybrid capabilities in the form of milling/grinding. The new machines are able to combine milling and jig grinding on the same machine without any impact on its footprint or performance. The grinding setup has been designed in order to maintain standard workpiece dimensions and the clamping surface for automated processes. The laser measuring system and the dressing spindle, with an adjusted rpm from 3,000 to 20,000, remain located closer to the working area for a quick and fast grinding process. In addition, the dressing spindle has been installed with a slight inclination in order to be able to dress any type of grinding tool without issue.

Inclinable and adjustable dressing spindle close to the working area for a fast grinding setup and process

Through this two-in-one solution, the Mikron MILL S/X (U) series reduce the time and complexity of the customers' manufacturing process. The combination of the milling and the grinding technologies, extremely high machine dynamics and consistent thermal stability thanks to the Ambient Robust technology ensure high accuracy and a fast ROI for high quality parts. The dressing spindle is equipped with an Acoustic Emission (AE) sensor to track and visualise the signal on the HEIDENHAIN control during the tool dressing. The machine can be equipped with an additional AE sensor to track grinding operations to optimise the process further. Thanks to the additional AE sensors on the machine table, operators can adapt their process even more thanks to the automatic tool-piece detection cycle. This cycle, developed by GF Machining Solutions, avoids air grinding by detecting exactly when the grinding tool touches the part to start the process under optimal conditions.

GF Machining Solutions is one of the world's leading providers of complete solutions for precision components and tools manufacturers and the mould-making industry. Its portfolio includes milling, EDM, laser texturing, laser micromachining and additive manufacturing machines. Additionally, the division offers spindles, automation, tooling and digitalised solutions backed by unrivalled customer services and support. With its solutions, the division advances energy-efficient and clean manufacturing.
GF Machining Solutions is a globally acting division of the Georg Fischer Group in Switzerland and maintains a presence at 50 locations worldwide.

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E-mobility gearboxes are no grind with ETG

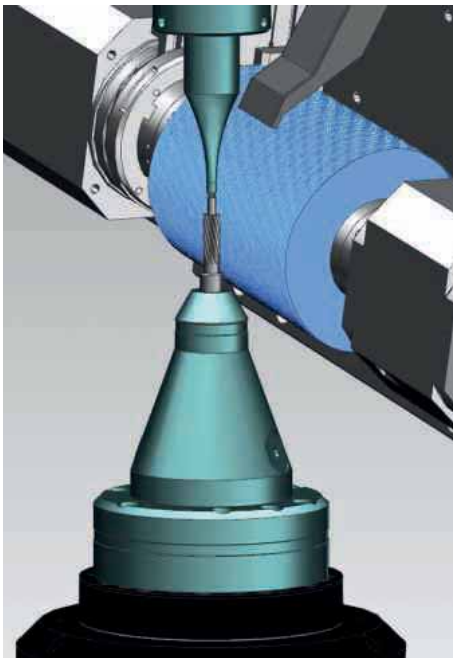
Gearboxes used in electric vehicles are not only designed for high speeds and high torques but they are also very compact. This is not only true for the automotive sector but also innovative applications such as E-bikes. These small but high power and electrically driven gearboxes inspire design engineers to come up with more creative solutions. With the gear manufacturing technology manufactured by Kapp Niles, the Engineering Technology Group (ETG) offers UK manufacturers unique industry-leading innovation for producing electric vehicle and E-bike gearboxes.

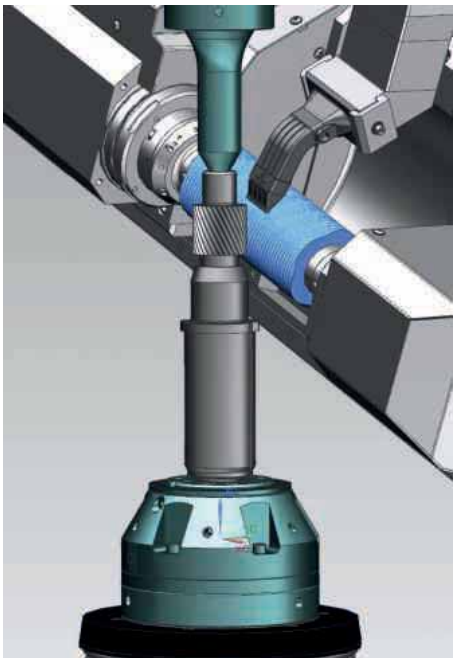
In many cases, gearboxes comprise of small components with interfering contours that pose new challenges during production. When it comes to the hard finishing of the gear teeth, the process-related potential goes hand in hand with high production costs. The most economical option is generating grinding. However, not all generating grinding machines are suitable for the production of compact components. Here, the gear grinding experts at ETG outline the relevant demands and demonstrate possible solutions.

Transmission manufacturing does not have to be reinvented to become suitable for the E-mobility sector, but there are some new challenges to be faced. These include, above all, the high power density and the compact installation space in which the entire power train must be accommodated.

At the same time, the new areas of application are opening up new sales opportunities, such as E-bikes, which have recently gained in popularity. They significantly enhance range and transportation capacities in everyday life and during leisure time, making demand high.

This benefits the manufacturers and their suppliers, gearbox manufacturers among them. However, be it two or four wheels, the drive technology is sophisticated. The focus is on the required flank load capacities and the noise behaviour of the gear teeth due to the boundary conditions imposed by the electric drive motor, an almost constant high torque over the speed range of 0 to 18,000 rpm. However, new challenges are not only limited to the machined parts but also directly affect the manufacturing process. Due to the compact design, an increasing number of components with interfering contours emerge in the gearbox design. Large tools with standard dimensions of the worm grinding wheel quickly and literally meet their limits. To avoid having to resort to more time-consuming and thus more expensive processes, the tools must also be miniaturised.





Identify and overcome boundaries

Up to now, the hard finishing of gears with interfering contours has mainly been accomplished by discontinuous profile grinding or gear honing. Compared to continuous generating grinding, both aforementioned processes feature different disadvantages in terms of productivity, economic efficiency or quality consistency. The problem is that the common grinding worms measuring 300 mm diameter are too large to handle components with interfering contours.

At the same time, smaller tools require higher speeds to achieve high cutting speeds. However, previously implemented machine concepts were not designed for the

and workpiece driving. New types of high-speed spindles in combination with a dynamic direct drive of the workpiece axis offer a solution. This enables manufacturers to exploit the advantages provided by generating grinding, a process that features shorter machining times, lower tool costs and a very high level of quality consistency. The economic efficiency of generating grinding in direct comparison to profile grinding can be demonstrated by the two selected components 'car' and 'bike'. The corresponding tables, 'Car' and 'Bike', provide an overview of the related time and cost benefits.

The right machines to cover the requirements

The Coburg-based machine tool manufacturer Kapp Niles specialises in system solutions for grinding gears. Through ETG, Kapp Niles offers two machine types for meeting customer requirements. Both series are equipped with high-efficiency drives for the tools, 25,000 rpm and the workpieces, 5,000 rpm. The KNG350 flex HS has a conventional design featuring one workpiece drive. The machine is available in two versions, one for miniature and small lot sizes with manual loading. For higher volumes, an automated version is available with an integrated ring loader. Workpieces up to 350 mm in diameter can be processed using this machine.

The machine features short setup times that are possible through the use of intelligent components and unique ergonomics. For large-scale production, it is worth taking a closer look at the productivity times of machines pre-set by design. The KX TWIN series with two workpiece drives and a loading and unloading process that is performed in parallel to the actual grinding operation offers further potential for the reduction of non-productive times. The in-line centrifugation of the components directly in the machine enables compliance with the 'Clean Factory' approach across all known automation concepts.

Additional production-related requirements

In addition to the machining of compact components with interfering contours, the following additional challenges arise when it comes to the production of E-gearboxes: The noise behaviour of the gearbox and the gear teeth has been increasingly gaining in its significance.

Table Bike	Profile grinding	Generating grinding
Tool data		
• Diameter [mm]	100	110
• Cutting material	CBN (galv.)	Corundum
• Surface ripples / number of splines	1	5
Non-productive time [s]	75	20
Tool cost per workpiece [€]	0.17	0.04

Table Car	Profile grinding	Generating grinding
Tool data		
• Diameter [mm]	80	80
• Cutting material	CBN (galv.)	Corundum
• Surface ripples / number of splines	1	5
Non-productive time [s]	228	53
Tool cost per workpiece [€]	0.75	0.21

As the load-bearing capacity of gear teeth is being continuously further improved, the topology of the tooth flank is increasingly moving into focus. During the grinding process, a natural interlocking occurs on the machined tooth flanks. With the innovative KN grind software, this phenomenon not only can be simulated in advance but can also be completely eliminated or precisely manipulated.

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The solution for grinding accuracy through machine spindle repairs

Thanks to its new partnership with KW Abrichttec GmbH, Master Abrasives can now offer more complete solutions for grinding applications and services to other processes, such as milling, alongside its established range of reliable, high-quality precision engineered dressing tools. The company now offers bespoke machine spindles for grinding and dressing, high-quality spindle repair services and unique systems for diamond roller mounting.

Any machine tool is only as good as the sum of its constituent parts: the accuracy, design and integration of those parts produces the tolerances, productivity and consistency required of any process, particularly grinding. The secret is to ensure these parts are maintained and serviced to the highest standard for an accurate, long life. One of the key parts of any machine tool is the main spindle and Master Abrasives' partnership with KW can offer machine tool owners and users a service and repair facility of the highest quality.

Paul Batson and Ronny Koennemann signed the contract for partnership last year to offer UK manufacturers an excellent spindle repair service and high-quality spindles

Spindle repairs

The process begins with the spindles being returned to KW headquarters where they are stripped and cleaned for a full assessment of what exactly is required to bring the spindle back to its former glory. A fully detailed itemised quote is then presented to the customer so there is complete clarity on what work needs to be carried out, what parts need replacing and the cost of this work. Once accepted, the KW team begin the precise work of bringing the spindle back to an "as good as new" condition.

While Master Abrasives is well known for its abrasives offering and will offer support to their extensive customer base in the grinding field, KW can also repair milling and machine centre spindles. Master and its team are happy to support this work and see this as another opportunity with its key partners to offer a "solution for industry."

Paul Batson, managing director of Master Abrasives comments: "The relationship between our two companies is a perfect fit, allowing us to offer high-quality dressing spindles and a complete spindle repair service for any spindle, not just grinding spindles. This complements our Master range of abrasives as well as our own range of dressing products. Our applications engineering team is looking forward to working with customers on their processes to improve productivity and spindle longevity.

"I'm also very pleased to add we will be representing KW Spindles in Poland via our sister company. Slawomir Klisiewicz, our national sales manager for Master Abrasives Polska, has already received the training required to support Polish customers with machine spindle and repair service queries."

The company will be able to offer new spindle products and services to the UK, Ireland, Poland and Mexico with this new partnership.

Having served the UK's Master Abrasives site abrasives needs for over 50 years, we have built a strong reputation for providing professional service and high-quality products with our Master® brand. Our strategy for business development within the British market is based on three distinct business units:

Abrasives

The abrasives product portfolio offers products for high-precision applications and surface finishing products from both the Master brand and Master Abrasives partners products.

There is an established fast service in on-site conversion of belts and MasterFlex products in a full range of materials. With belt conversion experience since 1980, the company can provide a broad range of belts in various joints at a lead time to suit the expectations of the market.

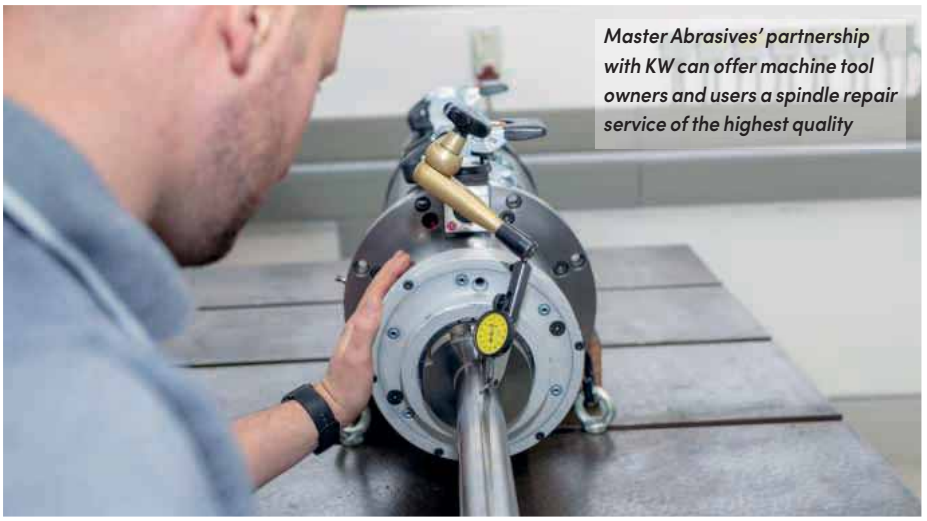
Master tool services

The tool services department offers the sale, service and repair of pneumatic and electric tools. It is proud to offer and be associated with the highest quality tool brands.

It also arranges preventative maintenance programmes aimed at assisting employers to manage the condition of their tools as well as risk assessments in accordance to the hand-arm vibration legislation to protect tool users from vibration injuries.

Machinery and equipment

Its "solutions for industry" for precision grinding applications includes a range of precision grinding machines such as hydraulic and CNC cylindrical OD, ID & centreless grinding machines. It also offers mass finishing machines, superfinishing devices and auxiliary equipment such as coolant nozzles.



Master Abrasives' partnership with KW can offer machine tool owners and users a spindle repair service of the highest quality

With extensive experience in precision applications, Master Abrasives has a deep understanding of not only the machine tool but the application itself. The aim is to provide solutions for every aspect of the grinding process, whether it's the grinding wheel, dresser, coolant delivery system or the machine.

Quality management

Working under the International Quality Management System, ISO 9001, it continues to set high standards. Through the supply of abrasive products designed for highly precise application or finishing process and tool services that set new standards in the industry, the Master name stands for quality, the same now as it has done for more than five decades.

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Increase productivity and reduce work time with Weiler Abrasives Solutions

By Blaž Meglič, business development manager for Weiler Abrasives

For Weiler Abrasives, a robust history of product development and building customer relationships has lead to continued growth.

The company's tradition of brush-making began in 1889 when Joseph E. Weiler began manufacturing brushes for the jewellry industry. Since then, the family-owned company has grown from a power brush manufacturer to a global surface conditioning leader. In Europe, the heritage of Weiler Abrasives dates to 1879, when Franz Swaty established a company for producing mineral bonded abrasives. In 2015, Weiler Abrasives expanded its capabilities by acquiring SwatyComet.

Throughout over 140 years of growth, Weiler Abrasives has remained dedicated to forging collaborative relationships with customers and developing solutions that help them tackle their toughest cleaning, grinding, cutting, deburring and finishing challenges.

One of the most desired product lines is Metalynx, a broad product line in two performance tiers: Metalynx MAX and Metalynx PRO. Products like UltraCut, Ceramic and ACCU thin cutting wheels are game changers for all operations

A commitment to exceeding expectations

The secret of Weiler Abrasives' success story as an industry leader lies in its commitment to continuously improving its products, processes, and services. Rather than resting on past achievements the company invests in product development to push the abrasives industry forward. Weiler Abrasives strives to:

- Help customers meet quality standards and production times
- Help customers reduce bottlenecks in their production operations
- Provide customers with solutions that meet and exceed safety standards and expectations

The company's operations are monitored and comply with ISO 9001 quality and ISO 14001 environmental standards. In addition, product safety is guaranteed by following EN and oSa standards. Weiler Abrasives also manufactures the fibreglass reinforcement used in their bonded cutting and grinding wheels. This is a key factor in controlling the quality and performance of these wheels.

In Europe, Weiler Abrasives focuses on the following industries: foundry, shipyard, rail, transportation, power generation, precision manufacturing, primary metals and general fabrication.

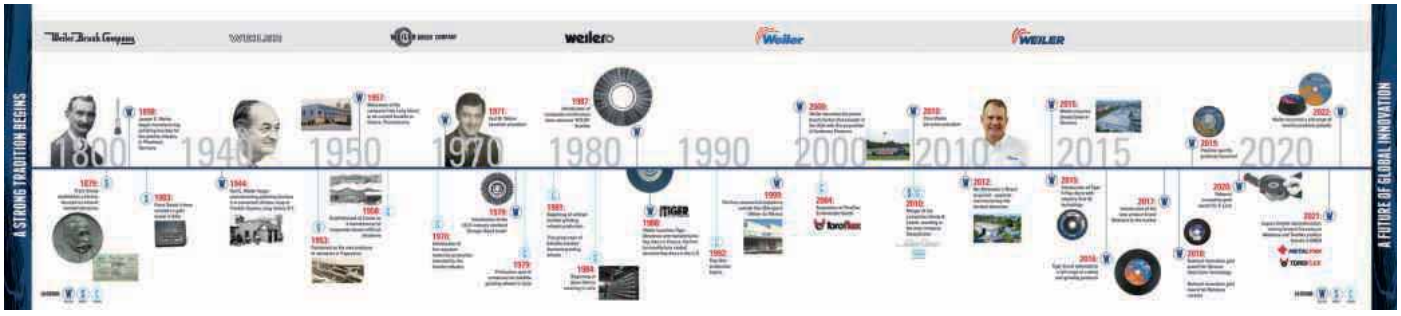
Weiler Abrasives' surface conditioning solutions are designed for specific needs. Application engineers and product managers listen to customer feedback and then design the proper solutions to best meet those demands.

For the company, it is important to maximise the productivity of abrasives in all operation settings. Application engineers and product managers bring solutions to customers for training, comparison tests, and demonstration sessions. The Weiler on Wheels (WOW) programme supports customers in the UK with a fully equipped van with abrasives products. Coming to their doorstep, customers can see how they can optimise their operations and achieve time and cost savings in their own settings.

Supported by virtual reality, Weiler Abrasives offers safety training to customers. These simulations help them experience product usage and see the savings they can achieve when using the right products in the right applications.

Strong presence in the UK market

The complete portfolio of Weiler Abrasives products for industrial grinding, metal fabrication, and surface conditioning is



available in the UK. Following the motto "Irreplaceable Together," Weiler Abrasives joined forces with International Abrasives. This partnership enables Weiler Abrasives to maximise the value to customers in the UK market with next-day delivery.

One of the most desired product lines is Metalynx, a broad product line in two performance tiers: Metalynx MAX and Metalynx PRO. Products like UltraCut, Ceramic and ACCU thin cutting wheels are game changers for all operations.

Scan the QR code to learn more about Metalynx

Faster, safer, better

Weiler Abrasives transforms challenges into new opportunities for growth. They are driven to increase productivity, lower operational costs and improve safety.

The Weiler on Wheels (WOW) programme supports customers in the UK with a fully equipped van with abrasives products

Power up your operation and contact: **info.slovenia@weilerabrasives.com**

As an industry leader and global manufacturer of surface conditioning solutions, Weiler Abrasives is eager to create a collaborative partnership to overcome your toughest cleaning, grinding, cutting, deburring and finishing challenges.

As a family-owned business, Weiler thinks and acts for the long term. It does business not to make a quarterly earnings number, but because it is interested in mutually beneficial partnerships. Weiler knows where it is going, driven by impassioned spirit and investing to get there. You are invited to join it on the journey and partner with the next global market leader in abrasives.

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Reaching the goal with know-how

Optimum results in precision machining

When selecting bonded abrasives for precision machining, the quality benchmark is increasingly how to manage the compromise between high stock removal, long tool life and excellent surface results. Bonding systems, abrasive grain selection and combination tools are key factors here.

Maximum performance with maximum economy

As everywhere else, the demands of the manufacturing industry on its suppliers in terms of attractive costs, fast availability, guaranteed process stability and competent advice are increasing in the field of precision finishing as well. The challenge for all grinding tool suppliers is therefore to provide products that meet these requirements and guarantee maximum performance with the greatest possible cost-effectiveness.

High stock removal rates are, among other things, the key to success, since they reduce the machining times significantly. However, the associated higher loads on the tools must not result in shorter tool lives and thus more frequent tool changes.

In order to guarantee long tool life and high productivity at the same time, grinding tool specialists such as Hermes Schleifmittel GmbH develop a grinding tool specification for each application that is adapted to the specific conditions, workpiece, task and machine, with the most suitable combination of cutting material and bond material.

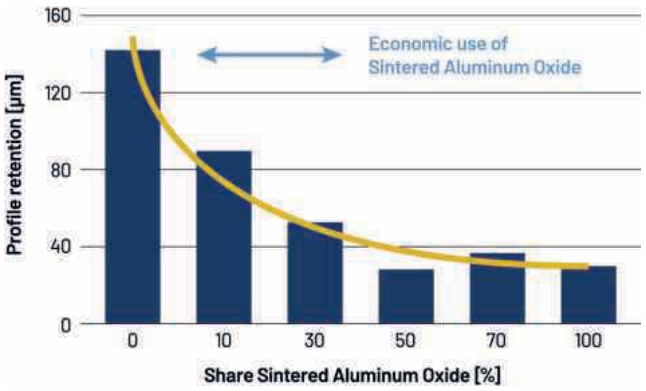
Always in focus: the optimum bond

The bond plays a decisive role in the self-sharpening effect of the grinding tool during the grinding process, as it holds the abrasive grains in the tool and gradually releases them. By modifying the strength of the bond or adjusting the bond volume, the wear behaviour of the grinding tool can be significantly optimised. The VITRA bond recently developed by Hermes takes this into account and, thanks to its high strength, guarantees a large pore volume, which favors chip removal as well as the transport of cooling lubricant. The result is particularly high productivity as well as reduced tool wear rate.

Sometimes less is more

It is generally known that the choice of abrasive grain has a decisive influence on the grinding process. However, it is less well known that a look at the level of concentration of the grain also has a decisive influence on efficiency.

Studies have shown that the profile retention of grinding wheels during surface grinding increases significantly, especially with sintered aluminum oxide concentrations of up to 30 percent. At higher concentrations, the profile retention improves only slightly despite significantly increasing tool costs, so that the tool life is also only slightly positively influenced.



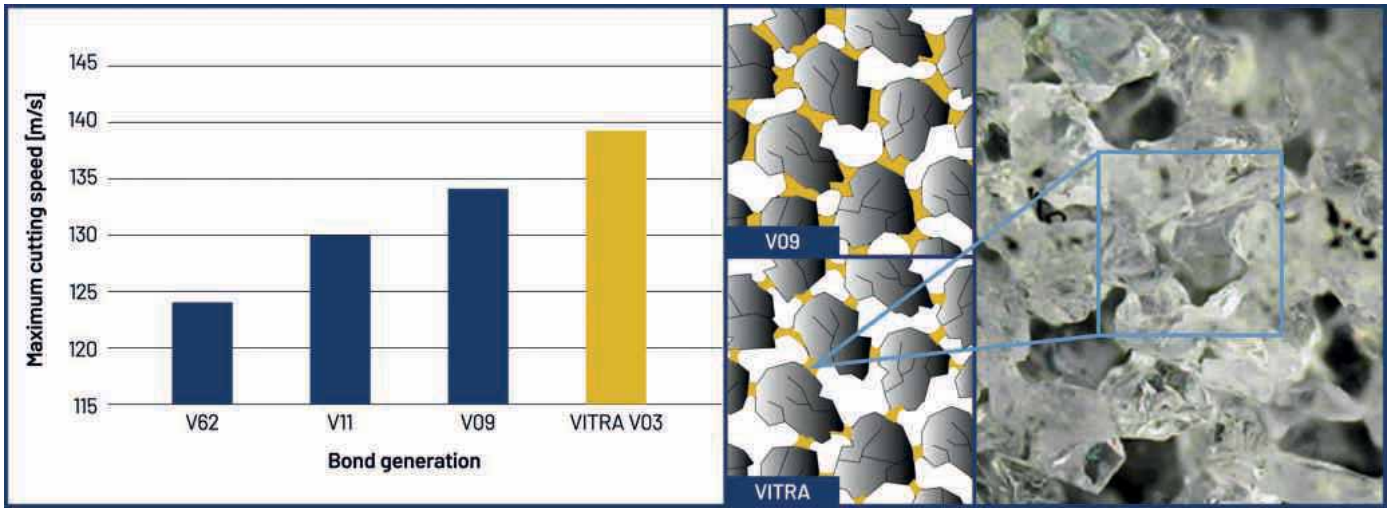
Profile wear as a function of sintered aluminum oxide concentration during surface grinding

Developed for highest performance

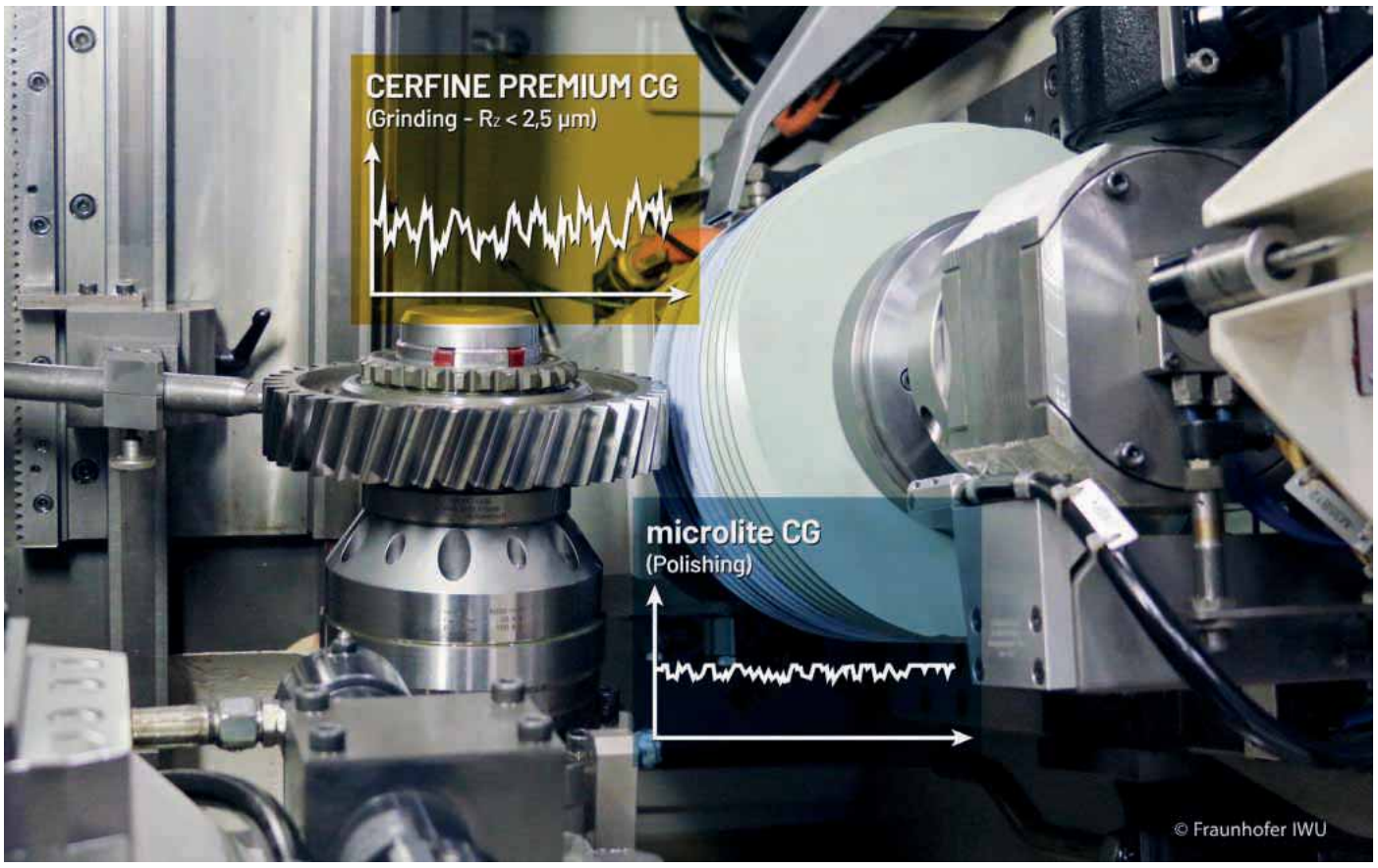
All these findings have been incorporated into the latest product development from Hermes Schleifmittel, CERFINE Premium+. A product line specifically for applications with the highest performance requirements, it guarantees extremely high stock removal rates under absolutely safe process conditions and can be used to optimise a wide range of grinding processes.

The best finish for high-quality surfaces

Optimum process productivity is only one of the requirements that



Performance comparison of cutting speeds of different bond generations



must be met. The quality of the surfaces produced must also meet the very highest standards for aesthetic or technological reasons.

To achieve these requirements, for example in the area of mass production of gears for the manufacture of transmissions for electrified vehicles, generating gear grinding processes with combination tools are used for many reasons.

These combination tools consist of a ceramic part for initial grinding and a microlite part with fine grit sizes for polishing the tooth flanks. These tools thus score not only in terms of increased efficiency, as they enable grinding and polishing in a single setup without time-consuming and error-prone tool changes. They also deliver optimum surface qualities, as both tool components and the technology that connects them are designed precisely to meet individual requirements and this interaction readily achieves the required surface finish.

The key to success: know-how and individual solutions

Universal solutions in terms of grinding tool selection and process control do not bring sufficient success when it comes to increasing production requirements or remain far below the achievable maximum. This can become apparent by falling short of the required surface quality, too low process productivity or too low economic efficiency.

Just as there is no need to use a sledge-hammer to crack a nut when grinding and use unnecessarily expensive tool specifications, thus driving up production costs for no reason.

Only through the targeted analysis of the process steps and the subsequent customized production of the corresponding tools can all component requirements be met while maintaining or optimising the required productivity and economic efficiency. With its comprehensive product portfolio and experienced application technology experts, Hermes is the ideal partner for anyone who wants to get more out of their processes.

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Wide range of solutions from Lapmaster International

DL Range

Lapmaster International is a company that provides precision surface finishing solutions for various industries. Its new DL range of dual face lapping machines is a type of lapping equipment that allows for the simultaneous lapping of two surfaces in one operation. These machines are designed to provide high precision, efficiency and versatility for a variety of applications.

The DL range of dual face lapping machines offer several advantages, such as increased productivity, reduced cycle times, and improved part accuracy. These machines use advanced processing technology to ensure consistent and reliable results. Additionally, the DL range is equipped with user-friendly controls, allowing for easy operation and maintenance.

Lapmaster International's DL range of dual face lapping machines are suitable for a variety of industries including optics, electronics, aerospace and more. The machines can be customised to meet specific customer requirements and can be used for lapping a variety of materials including glass, ceramics, metals and more.

Polishing and lapping machines

Lapmaster International is a leading provider of precision lapping and polishing solutions for a wide range of industries. The company has been in business for over 70 years and has established a reputation for delivering high-quality products and services to its customers.

Lapmaster offers a comprehensive range of lapping and polishing machines, consumables, and accessories. Its products are used in a variety of applications, including the aerospace, automotive, electronics, and medical industries. The company's machines are designed to achieve consistent and repeatable results, making them ideal for precision surface finishing solutions.

One of Lapmaster's most popular products is its line of lapping machines, which are available in both manual and fully automated configurations. These machines can be equipped with state-of-the-art technology, such as digital controls and non-contact measuring systems, which help to ensure that the lapping process is efficient and accurate. Additionally, Lapmaster's lapping machines are easy to use and maintain, making them ideal for both novice and experienced operators.

In addition to its lapping machines, Lapmaster also offers a range of polishing machines, which are designed for use in applications where a high level of surface finish is required.

Lapmaster is committed to providing its customers with high-quality products and services. The company's team of experts is available to assist customers with the selection, installation, and maintenance of its products. In addition, Lapmaster offers training and technical support to help customers get the most out of its products.

Flat lapping: The process of achieving precision surface finish

Flat lapping is a precision machining process that uses abrasive material to produce an extremely flat and uniform surface on a workpiece. The process involves a low-speed rotating lap plate/plates that uses abrasive particles to remove small amounts of material from the surface of the workpiece. The end result is a surface with a high degree of accuracy, uniformity and smoothness.

This process is commonly used in the manufacturing of optical components, where high precision is essential. Flat lapping is also used in the production of precision mechanical components, such as bearings, valves and gears.

One of the key benefits of flat lapping is that it can produce a high degree of accuracy and uniformity in surface finish. This is achieved by controlling the parameters of the process, including the speed and load and type of the lapping plates, the size and type of abrasive material and the duration of the lapping process.

In addition, flat lapping can produce a smooth surface that is free from defects and blemishes. This is particularly important for optical components, where a smooth surface is essential for the proper functioning of the component.

Flat lapping can also be used to produce a mirror-like finish on a workpiece. This is achieved by using a finer abrasive material and applying it to the surface for a longer period of time. The result is a surface that is smooth and reflective and can be used in applications where high levels of accuracy, transmission or reflectivity are required.

In conclusion, flat lapping is an essential precision machining process that is used to produce flat and uniform surfaces with high accuracy and smoothness. Whether used in the production of optical components, precision mechanical parts, or for achieving a mirror-like finish, flat lapping is an essential process for many manufacturers.

Contract lapping

Lapmaster International's contract lapping and polishing department is a specialised division of the company that provides

precision surface finishing services to customers. The department is equipped with advanced lapping and polishing equipment and staffed with experienced technicians, allowing it to provide high-quality results for a variety of applications.

These services cover a wide range of materials, including glass, ceramics, metals, plastics, and more. They are provided to meet customers' exact specifications and requirements.

Its specialist department is equipped with state-of-the-art equipment, including dual face lapping machines, precision polishing machines and other specialised machinery. The technicians are highly trained and experienced in the use of these machines and they use advanced techniques and abrasives to produce accurate and consistent results.

Lapmaster International's contract lapping and polishing department provides a wide range of benefits to customers, including: Improved part accuracy and consistency; Reduced cycle times; Increased productivity; High-quality surface finishes and reduced waste and lower costs.

These services are suitable for a variety of industries, including optics, electronics, aerospace and more. The department is dedicated to providing high-quality results and exceptional customer service and is committed to meeting, and exceeding, customer expectations.

Optical polishing

Lapmaster International's optical polishing department is a specialised division of the company that provides precision optical lapping polishing services to customers. The department is equipped with advanced optical polishing equipment and staffed with experienced technicians, allowing it to provide high-quality results for a variety of optical components and applications.

The optical polishing services offered by Lapmaster International cover a wide range of materials, including glass, ceramics, and crystals. The services are performed to meet customers' exact specifications and requirements, and can be tailored to meet specific dimensional tolerances, surface finish requirements, for a variety of material specifications.

Pitch polishing is a specialised type of optical polishing that involves using a flexible abrasive material, such as pitch, to polish optical components. Pitch polishing

provides a number of benefits, including improved surface finish, reduced cycle time and increased productivity.

The optical polishing services offered by Lapmaster International are suitable for a variety of industries, including optics, electronics, aerospace, and more.

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Achieving perfectly polished spheres with the KemiSphere II

Medical implants are a crucial aspect of modern healthcare, providing a wide range of patients with an improved quality of life. As the demand for medical implants increases, manufacturers are being asked to meet ever-higher standards of surface finish and profile accuracy. To meet this demand, Kemet International Ltd has developed and automated precision surface finishing processes, specifically for the Medical Industry. In this article, we will take a detailed look at the Kemet process development laboratories and their latest development, the KemiSphere II. We will also explore the Kemet Tibial Polishing Cell and the benefits that these technologies can offer to medical implant manufacturers.

The Kemet process development laboratories have been successfully developing special purpose polishing machines for a wide range of medical implants. These machines are designed to meet the specific needs of medical implant manufacturers, providing them with high-quality, precise surface finishes that meet the demands of the industry.

The KemiSphere II is the latest development from Kemet and is a bench-top spherical/ball lapper/polisher. This machine is specifically designed to lap and polish spherical forms using either a single polishing process or, where required, a 2-stage lapping and polishing process. The machine has Siemens HMI, PLC and Drivers with space for storage of programs to make validations simple. All parameters can be locked off so that only validated processes can be selected. Multi-level password access allows process development and new product to be added in a controlled way, essential for the industry.

The Kemet Tibial Polishing Cell has been specifically developed for finishing large production quantities of flat Tibial Trays. A typical cell contains Kemet smoothing, polishing, and cleaning systems. The cell provides a fully automated solution for polishing medical implants, allowing manufacturers to achieve high-quality finishes while also reducing costs and increasing production speeds.

The Kemet polishing systems are designed to meet the specific needs of the medical implant industry, providing manufacturers with a reliable and repeatable process for finishing medical implants.

Kemet's commitment to customer satisfaction is reflected in the company's policy of carrying out all process development work for customers free of charge. This means that manufacturers can work with Kemet to develop and optimise polishing processes for their specific needs, without incurring any additional costs.

Contact Kemet on 01622 755287 or via email at sales@kemet.co.uk to schedule lapping and polishing trials. This will allow Kemet to determine the optimal finishing solution for your needs.

Kemet
Tel: 01622 755287
Email: sales@kemet.co.uk
www.kemet.co.uk

The world's first fully automated grinding and polishing solution

Xmatic, the world's first fully automatic end-to-end grinding and polishing solution, has been developed and produced by Struers, a leading materialographic solutions and services provider. Xmatic delivers best-in-class reproducibility and process efficiency, enabling materialographic labs to prepare more samples with fewer resources

In today's high-pressure industrial environments, many materialographic labs face the same issue: How to increase throughput without any loss in quality. Struers developed Xmatic to solve this challenge. By fully automating the grinding and polishing process, Xmatic enables labs to deliver more specimens with fewer resources and with no drop in reproducibility. This will be essential in the near future, as consolidation will mean fewer manufacturers will produce larger batches across many different production sites.

"This puts greater pressure on businesses to deliver consistent product quality, globally. So, there'll be a need for solutions that enable greater throughput, accuracy and efficiency, ideally without incurring more cost," says Jacob Rubæk Holm, associate professor in industrial dynamics and quantitative methods.

In materialographic labs, this can be achieved through automatic solutions, such as Xmatic.

32 finished specimens with just 5.5 minutes of operator time

As an end-to-end automatic solution, Xmatic handles the entire grinding and polishing process. Once the specimen holders are loaded into the machine, Xmatic completes all process steps automatically including plane grinding, fine grinding, cleaning between steps and final polishing. It then delivers clean dry specimens, ready for analysis.

As well as improving reproducibility, this drastically reduces the amount of time lab technicians spend on specimen preparation.

Xmatic can produce 32 finished specimens in around 190 minutes, but it only takes 5.5 minutes for the lab technician to set up the machine, load the specimen holders and allocate a method to each holder. Everything else is done automatically. As a result, labs can produce specimens with fewer resources and lab technicians have time to complete more complex and challenging work, such as analysis. Xmatic has been developed for reproducibility, process standardisation and ease-of-use. It has an intuitive user interface that lowers the requirements for operator training, as well as a host of features to increase accuracy and throughput. These include automatic force adjustment based on the number of specimens in the holder, automatic recognition of consumables, accurate dosing control and high efficiency cleaning and drying.

The groundbreaking Xmatic was launched on 15 September and is available globally. It comes in a number of versions, including a compact version for labs with limited floor space.

About Struers

Since 1875, Struers has led the way in materialographic products and services, helping customers to shape future developments and make the world a better place through the pursuit of deep scientific insights and ground-breaking technology. It provides customers across virtually every industry with a complete range of class-leading automated and manual equipment and consumables for every material type and lab process. This is supported by a global network that offers a huge knowledge base of expert service and applications support, a robust global supply chain and training programs.

This ensuring certainty is why it is trusted by businesses large and small, global and local, as well as by leading research institutes and universities worldwide, who depend on Struers for all their materialographic requirements.

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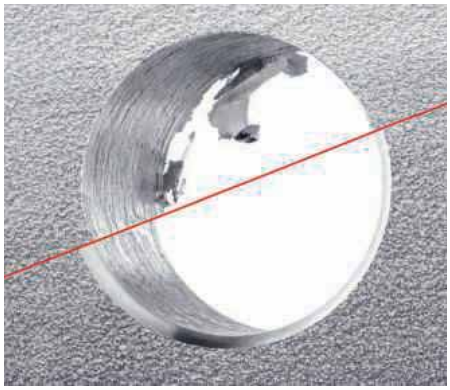
Process-reliable deburring of bores in serial production



Since burrs on bore edges can cause major problems during the operation of a workpiece, they usually have to be removed

Large batch quantities in serial production or demanding applications require reliable production processes. If the production of bores results in burrs, it is important to find a deburring process that removes them quickly and reliably. Which deburring process is the right choice? This report gives an overview of the most common methods of deburring bores as well as their individual strengths and weaknesses.

In industries such as automotive, aircraft or fluid power, manufacturing processes are constantly being optimised in order to produce large series as efficiently and cost-effectively as possible. Process steps are simplified, cycle times are shortened and repeatability in terms of quality is improved. Burrs on bore edges in particular can be big headache for production managers, who are challenged to find solutions that remove the burrs quickly, cheaply and reliably.

The right deburring process for every application

Important criteria for the choice of deburring method are the position of the burr on the workpiece, the material used and the manufacturing tolerances of the workpiece. The required deburring result, compatibility with the production process, machine capabilities and budget also influence the choice of the deburring solution. The most common deburring methods and their characteristics are listed below.

• In Thermal deburring (TEM), the material to be removed is vaporised by the intense heat caused by a chemical reaction. TEM is used in particular for complex geometries, areas that are difficult to access or for workpieces with many bores. External and internal edges are deburred at the same time. Almost all oxidising materials can be deburred using TEM. The result is a sharp or slightly rounded bore edge. The size of the deburring chamber limits the workpiece size and quantity of parts. The influence of the heat on the material and the geometry of the component must be checked.

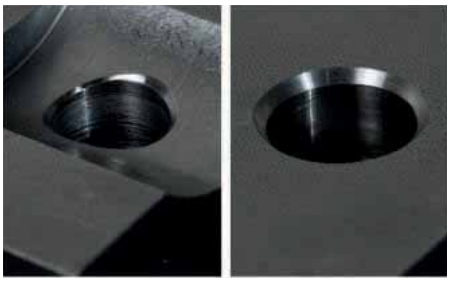
• Electrochemical deburring (ECM) removes burrs by eroding the metal. It is used for almost all metals, even hardened workpieces. As it is a non-contact technique with very low heat input, there is no tool abrasion, no formation of secondary burrs and no mechanical impact. The maximum burr size is limited to approximately 0.3 mm. The workpiece must be thoroughly cleaned before and after processing.

• With high-pressure waterjet deburring (HDW), several edges and difficult-to-reach bores can be deburred at the same time. A waterjet is directed with a pressure of up to 1,000 bar onto the parts of the workpiece to be deburred. A post-deburr inspection of the bore edge is required to check if particles have broken off due to mechanical stress and if the surface of the workpiece is still rough due to limited removal of the burr roots.

• When blasting with granulates, materials such as sand are directed at the bore edge at speeds of up to 80 m/s. Surfaces next to the edge are also affected by this process. Workpiece cleaning after deburring can be a challenge.

• In brush deburring, burrs are removed by special brushing tools. The handling is simple and the range of applications is wide due to the many different tool variations. The limits of brush deburring are large burrs, very hard materials and difficult to access areas.

• The term mechanical deburring covers deburring tools that enable the workpiece to be finished directly on a machining centre. The back machining of bores and defined edges are also possible. The techniques are characterised by repeatability and high process reliability. The methods can have their limits in areas of the workpiece that are difficult to access.



Mechanical deburring solutions provide consistent deburring results

Simple deburring despite manufacturing tolerances

The technologies in mechanical deburring are diverse, which is why we shall take a closer look at the individual characteristics. In circular deburring, interpolation, a predefined working path is followed by a tool. Depending on the given manufacturing or clamping tolerances, the chamfer may be too large, too small, or there may even be no chamfer at all. Tools with moving blades do not start deburring until they come into contact with the edge of the bore. This way, castings, for example, with their typical tolerance variations, can be machined reliably and with a consistent deburring result.

For all types of mechanical deburring, the great advantage is that it can be integrated into the existing machining centre. The

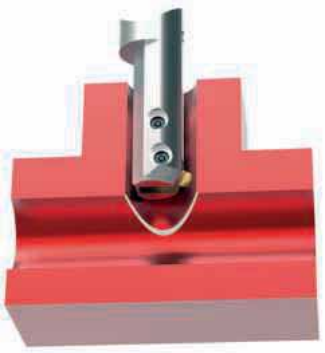
completed workpiece comes off the machine after only a slightly increased cycle time. Additional deburring-related steps are no longer necessary. By avoiding cleaning, logistics or external machining costs, the overall process costs and cycle times are reduced. Due to the consistent production technology and the simple handling of the tools, no training is required for the personnel. Existing manufacturing resources and knowledge are therefore optimally utilised.

Mechanical deburring solutions with moving blades, such as the COFA tool from HEULE shown here, deliver finished and deburred workpieces directly from the machine

Potential of application-specific solutions

Once a production manager has decided on a deburring method, it is important to find the right type and the right partner. An example from the field: A manufacturer in the E-Mobility sector has to deburr internal and difficult-to-access cooling bores on a rotor shaft. Until now, the deburring was done manually by hand. Due to a complaint from a customer resulting from a quality deviation, a more stable and automated deburring process had to be found for the approximately one million bores per year. In this deburring situation, the components have variations in the wall thickness and thus in the diameter of the inner main bore. Circular deburring is therefore not an option due to these tolerance variations.

At a tradeshow, the production manager became aware of HEULE Precision Tools and their deburring tools with moving blades. A solution using the X-BORES deburring technology was implemented and the customer was quickly convinced by the quality of the result. Today, the employee who was previously responsible for the manual deburring is working at another point in the production process. In the meantime, the customer has also contacted HEULE for further applications, even a customised tool solution is being developed. If there is no suitable tool in the standard range, HEULE offers tools that are customised for the specific application requirements. HEULE recommends all customers to involve the deburring specialist in the design stage as early as possible. Together, the geometry of the workpiece can be optimised to be as deburring-friendly as possible and the burr formation of the pre-operations can also be optimised so that serial production runs at maximum efficiency.



Internal bore edges with tolerances like those of a rotor shaft can be deburred using HEULE's X-BORES technology

HEULE Werkzeug AG Tel: 0041 7172 63827
Email: info@heule.com www.heule.com/en

Top-notch quality can only be achieved with a deburring machine

Large and heavy sheet metal parts, such as those used to manufacture tractors or cranes, are an integral part of the Salzgitter Mannesmann Stahlhandel GmbH (SMSD) portfolio. This includes maximum precision also for workpieces that are produced from thick metal via thermal cutting. At its site in Germany, SMSD manufactures these blanks, including necessary post processing of various kinds. Most of the materials are up to 40 mms thick with dimensions of up to 300 by 500 mms.

"ARKU had us fully prepared for the expansion of our machine capabilities," says Daniel Götze, product manager for pre-fabrication at Salzgitter Mannesmann Stahlhandel in Zeithain.

Deburring prior to leveling is a must

Nowadays, deburred sheet metal parts are a standard when it comes to customer requirements. But at SMSD there was more: In an important framework agreement, the steel trader had promised the customer specific flatness. For that, the metal parts require leveling. However, cutting thick metal requires a lot of energy. It also means that during the cutting process, large burrs are formed. These protrusions, if they remain on the workpiece, can damage the leveling rollers of the leveling machines. Deburring the metal parts before leveling becomes thus indispensable. Beforehand, SMSD were still manually deburring flame cut parts with angle grinders.

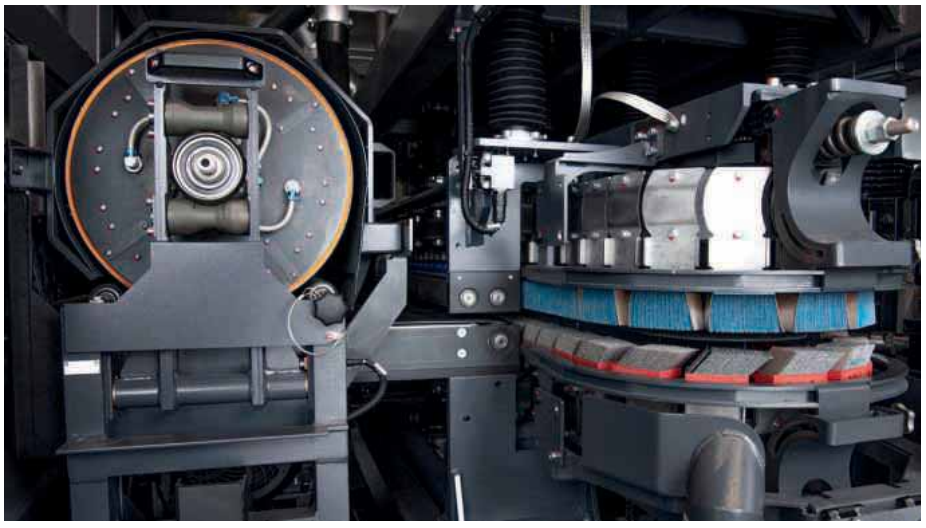
Consultation and tests are part of ARKU

"Before we purchased from ARKU, we received a comprehensive consultation including a comprehensive test of our production materials in the Baden-Baden leveling and deburring centre. Finally, the decision was made: The EdgeBreaker® 4000 met our expectations. With this system, we are able to process different metal sheets reliably and with consistently high quality," explains Daniel Götze.

These thick metal sheets are no problem for the ARKU system at all. The EdgeBreaker 4000 reliably deburrs and precisely rounds such workpieces thanks to the oscillating grinding drum on both sides in just a single pass. The machine also masters stubborn burrs and slag, in particular those that are created by thermal and plasma cutters.

EdgeBreaker 4000 deburrs and edge rounds particularly thick metal sheets and parts reliably in just a single pass. The deburred flame cut parts fulfill all customer requirements and the deburring machine offers consistent high quality results when compared to doing the process manually.

Flexibility is the key to the EdgeBreaker 4000: After the burrs and slag caused by flame cutting have been removed via the grinding drum, you can simply choose between double-sided deburring or edge rounding. Specifically catered towards your optimal single pass deburring and edge rounding results.



Deburr and edge round within seconds

Burrs on metal parts will impact the quality of the product and reduce the lifespan of machines and tools. In manual deburring,

employees deburr and edge round the material edges via handheld angle grinders. Yet, deburring by hand takes a lot of time. A modern sheet metal deburring machine removes burrs four times faster compared to working by hand. Hence, the investment in a deburring machine is quickly paid off.

ARKU offers machines and services with high value retention. In doing so, it ensures process reliability and efficiency for customers all over the world. Its machines and systems form this foundation. To successfully handle tomorrow's challenges, the company are positioned to meet the demands of the future. Yet, it also remains true to its origins: precision is its promise.

For decades, ARKU has been a market and technology leader for precision levelers. Innovative deburring technology expands its industrial expertise.

ARKU Maschinenbau GmbH
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FINAIDS installs new Lissmac SMD123RE

Finishing Aids and Tools has completed the installation of a new Lissmac SMD123RE machine at RJW Sheet Metal Ltd in Wimborne, Dorset. The machine was delivered complete with two extraction units, abrasive belts and a full set of Alox, ceramic and silicon carbide deburring brushes and installed by a Lissmac approved engineer in January of this year. The SMD123 is designed for the deburring of mild steel, stainless steel and aluminium parts and, thanks to the Super-Grip conveyor belt, can process parts as small as 25 x 25 mm without the need for a vacuum system. This is particularly helpful for manufacturers with limited space as the machine boasts a space efficient footprint and the absence of any requirement for a vacuum system offers considerable savings on running costs versus other machines in this class.

"It's been an excellent addition to our production floor" says David Reeve, fabrication manager at RJW. "We received a full training session from Kris after the

installation was completed and after a few hours of everyone getting used to the new controls and capabilities of the Lissmac machine we were off and running. In a matter of weeks, it has become the go-to machine for our staff and this is testament to the versatility of the SMD123RE and its easy-to-use controls. We are over the moon with the whole process of ordering through to installation and the continued supply of consumables from FINAIDS allows us to plan production without stress or complication"

If you would like to learn more about the Lissmac range of deburring machines, please get in touch with the team at FINAIDS via email to sales@finaids.com or call 01480 216060.

FINAIDS
Tel: 01480 216060 (South)
Email: sales@finaids.com
or 0161 705 1300 (North)
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Brushing up on deburring and finishing in tight spaces

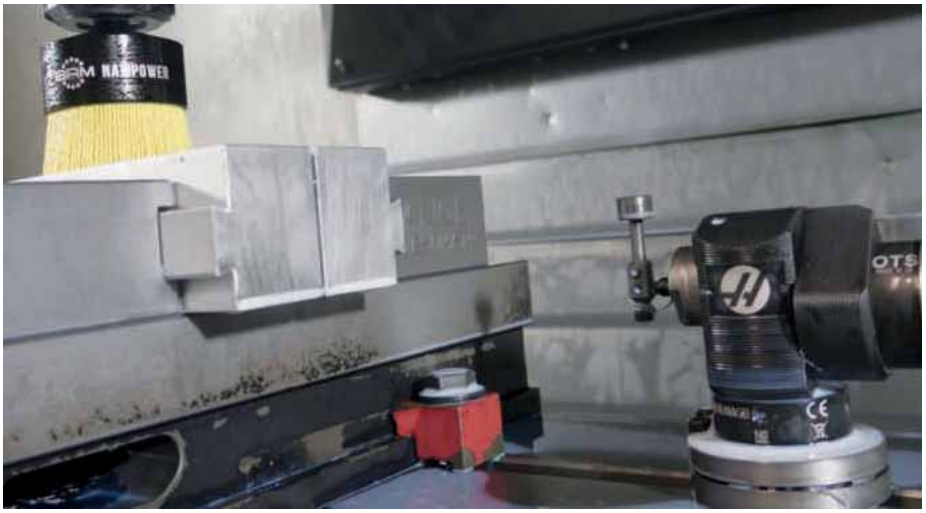
Masters Machine has cut cycle times nearly in half with BRM's Nampower ceramic end brushes. The tools provide machine shops with more precise finishing and deburring options, as well as design improvements to facilitate reaching deeper into workpiece holes, bores and constrained spaces.
Space is usually at a premium for machine shops. Now, in addition to overall floor space limitations, CNC machines and other equipment are becoming increasingly sophisticated and smaller, which can create new challenges.

Masters Machine Co., for example, employs several small Swiss-style CNC lathes that can be difficult to work around. "The Swiss lathes have a much smaller machining envelope and less room for tooling," explains CNC machine programmer and process improvement machinist Zachary O'Connor.

A solution was imminent. The Round Pond, Maine-based shop, which produces precision components for the aerospace, automotive, commercial and electronics industries, prides itself on upgrading and applying new methodologies to continually improve its processes. Founded in 1957, the company employs about 85 people at its 86,000 sq ft facility located in a small fishing village in mid-coast Maine.

Zachary O'Connor, who joined Masters Machine in May 2021, was eager to contribute to his new team. He brought experience from a previous job with another Maine machine shop where he began working with Brush Research Manufacturing Co. (BRM), which specialises in abrasive disc brushes for finishing, deburring, surface prep, homogenising part surfaces, radiusing and edge breaking.

BRM's new line of smaller ceramic end brushes builds on the qualities of abrasive disc brushes that allow CNC operators to automate the deburring process while delivering an ideal surface finish in the same operation, according to the company. The tools provide machine shops with more precise finishing and deburring options, as well as design improvements to facilitate reaching deeper into workpiece holes, bores and constrained spaces.



Improving performance

As is the case for many machine shops, one of the goals of Zachary O'Connor's former employer was to achieve the required surface finish and/or deburring while increasing cycle time. Taking this into account, he sought to improve the speed and quality of the surface finish on a cold-rolled, 4-ft (1.21-m) steel part prior to nickel plating for a semiconductor-related assembly.

BRM's Nampower ceramic end brushes are available from 2" down to 1/2", in a high-density configuration for more cutting points for increased efficiency and performance.

For another steel part, the machine shop was attempting to deburr a slot using a two-flute drill run at a very slow feed rate. Unfortunately, this approach often rolled the burr over, instead of removing it completely. As a result, Zachary O'Connor noted, CNC operators were putting in too much time and not getting the desired result.

To resolve the issue, he turned to BRM's NamPower abrasive brush line. Composed of flexible abrasive nylon filaments bonded to a fibre-reinforced-thermoplastic base, these disc brushes contain a combination of ceramic and silicon carbide abrasive. The filaments work like flexible files, conforming to part contours, wiping and filing across part edges and surfaces to deliver maximum burr removal rates along with an ideal surface finish, according to the manufacturer.

While some other abrasive nylon filament products use silicon carbide or ceramic, the combination of both in one tool makes NamPower unique, BRM pointed out. The two abrasives complement each other: ceramic is responsible for material removal but tends to cut a bit coarse; and silicon carbide acts as a buffer to the cutting action. The combined result enables deburring and finishing in a single operation.

Each brush essentially "self sharpens" over its life as well. Because of its linear construction, sharp new grains constantly come in contact with the work surface and wear off, exposing fresh cutting particles. This provides consistent deburring action throughout the length of bristles.

Masterclass

At Masters Machine, Zachary O'Connor heard about the expansion of BRM's product line to include smaller, re-designed ceramic abrasive end brushes designed to work with smaller parts and in more constrained spaces. Naturally, he wanted to try them out on the Swiss CNC lathes: "I was dealing with a tricky deburring application in a high-production scenario," he notes.

Like the NamPower brushes, the new Abrasive end brushes are designed to enable efficient, precision deburring and finishing in a range of applications and materials. However, the end brush

incorporates several design changes that allow them to be used on smaller, more complex parts or in smaller CNC machines.

The 'fill' on the brushes is also very dense to provide more cutting points, a factor that allows the tool to cut more efficiently, while lasting longer. The tool is designed to be loaded directly into automated machining centers with no special adaptors.

In June 2021, Zachary O'Connor purchased an 80 Grit, 1", 25.4 mm, abrasive end brush that he could mount in a gang of tooling to be used for deburring and precision finishing operations on a variety of parts.

Adding up the savings

Since their installation in September 2021, the end brushes have saved Masters Machine considerable production time. Zachary O'Connor estimates the shop previously could machine 300 parts in 24 hours for parts that required deburring/finishing. Cycle times have been cut nearly in half with the new BRM abrasive tool and adjustments to the programming.

"I was able to increase the spindle rpm and feed rate to run faster surface footage, while producing the quality finish required," he says. "The ability to reduce cycle times using the end brushes is also critical, particularly in a high-volume production shop like Masters Machine. Because we complete thousands of orders, if we can reduce cycle time by 20 or 30 seconds per part, that provides incredible cost savings." The high-density ceramic design prolongs tool life as well.

Zachary O'Connor concludes: "The end brushes are performing very well and we are getting really long life out of them. In the past, we had to change out our spot drills after 300 to 400 parts. Now we are running entire jobs with 2,500 parts with one end brush."

"As far as finishing and deburring goes, the sky is the limit. The end brushes are very adaptable to each application. A machine shop is essentially only limited by its own creativity."

Brush Research Manufacturing
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The questions to ask to achieve effective cleaning results

by Elizabeth Norwood, senior chemist, MicroCare LLC

For metal parts to pass quality and validation inspections they require planned finishing techniques. Cleaning is a crucial part of this, helping to guarantee reliability and ensure successful down-line production processes like coating, anodising, adhesion and plating are completed successfully.

Your cleaning process should be carefully planned and investigated at the earliest stage in production. Ideally, before any prototyping, fabricating or assembly begins. However, sometimes this is not practical. For example, machines break down and need to be replaced or last-minute substitutes for parts materials might be necessary. These types of changes may require new cleaning equipment and fluids to ensure quality finished parts.

So, when planning a new cleaning process or switching to a different one what are the primary decisions to make? Do you choose the cleaning equipment, or the cleaning fluid first? Most parts cleaning experts agree; if you choose the cleaning equipment first, you could be left with an expensive machine that is not suitable for cleaning the manufactured parts and will simply not be up to the job. Without careful investigation, it could be a very costly mistake.

To ensure you make the right decision, there are three questions that should be answered.

1. What is the contamination?

You should always match the cleaner to the parts' contaminant to ensure it will work effectively and remove the soils without leaving residue behind.

Typical production contaminants like machining, stamping or cooling oils, dust, metal filings, marking inks and fingerprints can be difficult to remove, particularly on metal parts with complex geometries and internal blind holes.

Metal contaminant is usually divided into three categories: polar, inorganic, non-polar, organic and particulate soils.

Inorganic contamination includes emulsion residue, salts, soaps and graphite.

Cleanliness testing: An expert precision cleaning fluid suppler can perform on-site audits or in-lab tests with your contaminated sample parts to ensure the equipment and cleaning fluids you choose are correct

Corrosion and tarnish, heat scale, smuts, carbonaceous and metallic compounds are also classed as polar contaminants. Soluble in water, these soils can be removed using aqueous cleaning machines and water-based detergents and surfactants.

Organic soils are non-polar halogenated, hydrocarbon contaminants. They include machining oils, grease, resins and corrosion protection agents. Because these soils do not dissolve in water, choosing an aqueous cleaning system is a poor choice. A vapour degreaser and specialty solvent-based cleaning fluids are the most effective option for this type of contamination.

Particulate soils include metal shavings, dust and polishing pastes. They are insoluble, therefore will not dissolve in either water or solvent. To remove particulate, they must be displaced. This is achieved when the cleaning fluid gets underneath the particulate and breaks any static bond holding the soil in place. Particulate cleaning can be used in both aqueous and solvent-based processes.

2. Which cleaning fluid?

Once you have established the contamination, the next point to investigate is what cleaning fluid would be the most effective? These are categorised into three main types: mono-solvent, co-solvent and bi-solvent cleaning.

Mono-solvent cleaning

Mono-solvent cleaning, as the name suggests, uses a single cleaning fluid inside a traditional two-sump vapour degreaser to clean, rinse and dry parts.

Mono-solvents are relatively strong and high-boiling to remove hydrocarbon-based stamping oils, machining lubricants, corrosion protection agents and metal shavings. They can also melt waxes off metal parts. Mono-solvent cleaning is typically used on organic contaminants including rosin-based fluxes, light oils and particulate. Parts are cleaned in the boil sump, rinsed in the rinse sump and then dried in the vapour blanket above the two sumps.

Some mono-solvents are also azeotropes, an azeotrope is a cleaning fluid made with two or more components that when combined form a stable mixture. They do not separate and always behave as one solvent, even during boiling, cooling and distillation.

Azeotropes are typically engineered to render cleaning fluids nonflammable, to

enhance their cleaning performance or to improve their toxicity profile. They provide the cleaning performance and safety of a mixture of cleaning solvents, but with the easy storage, handing and disposal of a single or mono-solvent cleaning fluid.

Co-solvent cleaning

Mono-solvent cleaning is very effective for many parts cleaning tasks. However, there may be times when a mono-solvent just isn't getting the job done. Then it's time to consider either a co-solvent or bi-solvent vapour degreaser cleaning process.

Co-solvent cleaning delivers the speed and convenience of mono-solvent cleaning, but amplifies it with a second, high boiling temperature solvent for more cleaning muscle.

The two co-solvents have very distinct behaviors. One boils at a very high temperature and the other boils at a much lower temperature, working together to enhance overall cleaning performance.

The high-temperature, non-volatile solvating agent dissolves stubborn or more difficult soils including solder fluxes, silicone oils, synthetic greases, grinding media, polishing pastes, baked-on resins and inks.

The low-boiling, non-volatile rinsing agent then washes the solvating agent off the components and provides the vapour blanket for more cleaning and drying.

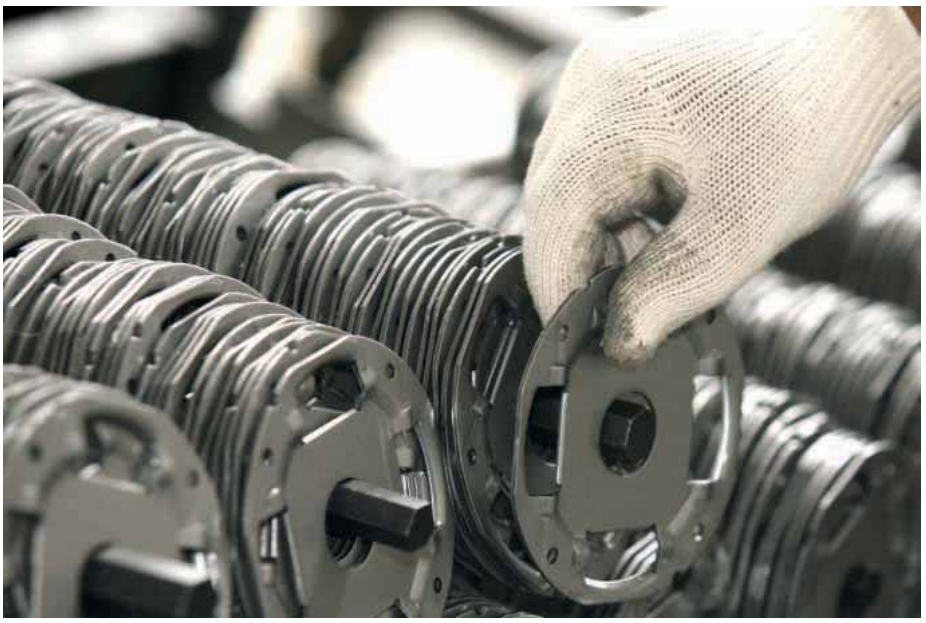
Bi-solvent cleaning

Another way to clean very tenacious soils like thick waxes, heavy pitches and viscous metalworking fluids is to use a bi-solvent method to dissolve or solubilise the contaminants for removal.

Bi-solvent cleaning uses a two-sump vapour degreaser and a separate preliminary cleaning tank. The solvating agent is in a separate cleaning tank outside of the vapour degreaser. It operates at much higher temperatures than the rinse agent in the rinsing sumps inside the vapour degreaser itself. The rinsing agent rinses the solvating agent off the parts but also loosens, lifts and washes away any residual contamination.

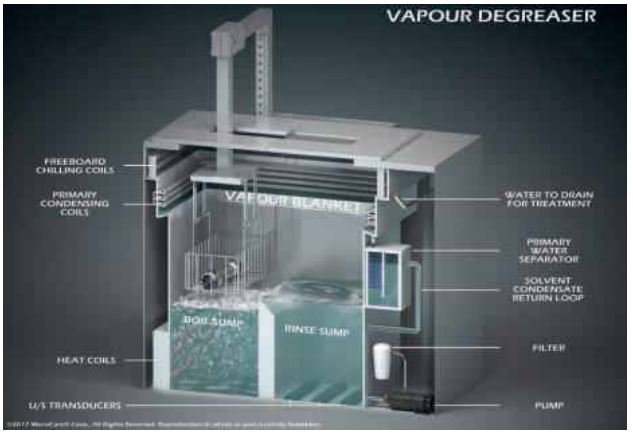
3. What cleaning process is best?

The final question to ask is, what cleaning process should be used? Before answering this question, you must test, test, and test. Working with a partner with the experience and knowledge to successfully clean metal parts is essential. They can perform on-site audits or in-lab tests with your contaminated sample parts to ensure the equipment and cleaning fluids you choose are the right ones for the job.



Industrial products: Parts contamination includes machining, stamping or cooling oils, dust, metal filings, marking inks and fingerprints

Based on specific parts material composition and the contamination found, they can recommend, or formulate, the fluids and metal parts cleaning methods that will work best.



Vapour degreasing: A vapour degreaser and specialty solvent-based cleaning fluids are the most effective option for cleaning organic, non-polar halogenated or hydrocarbon contaminants

Once you have received the results, you can confidently invest in the required cleaning equipment and cleaning fluids knowing they will not only clean effectively and meet specific regulatory, environmental standards, but also meet your throughput requirements and cleaning budget.

What's the answer?

So, the answer to the question, which should I choose first, the cleaning equipment or the cleaning fluid? The answer is both.

Cleaning fluid and equipment go hand in hand and must be chosen together for optimal cleaning results. Investing in larger, more expensive expenditures like capital equipment first could be a costly mistake. For example, buying a cleaning machine that does not have the necessary options or accessories to clean your metal parts effectively, or is not compatible with a particular cleaning fluid could mean the machine is left abandoned.

Choosing an incorrect cleaning fluid without the cleaning power to remove a particularly difficult contaminant for example, or the correct material compatibility, would be unproductive as parts would not be clean or could even be damaged.

Before making any decisions, always consult a precision cleaning expert who can determine which cleaning method is the right fit for your application and provide optimised cleaning solutions to your specific requirements.

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When are ultrasonics required in industrial parts cleaning and degreasing?

Ultrasonics are widely used for cleaning anything from jewellery to electronics and are used for a very wide range of engineering components. But what are ultrasonics and when should they be used as part of your cleaning regime?

Ultrasonic cleaning works by the transmission of high-frequency sound waves through the wash solution. The sound compression waves cause cavitation, microscopic bubbles in the cleaning solution, which implode on the component surface generating an intense scrubbing action. being cleaned.

For most industrial applications, ultrasonics are not the first choice, as they can require a relatively long wash cycle time compared to spray or immersion systems and they can be expensive.

However, there are several applications where ultrasonics can be very valuable, typically:

- Tenacious contamination
- Intricate shapes with small apertures
- Removing fine contamination to achieve high cleanliness specifications

Some tenacious contamination can be blasted off with sprays or harsh chemistry e.g. many greases, but others tend to cling on and need a more subtle approach, e.g. some polishing compounds and NDT solutions.

Complex shapes can also benefit from ultrasonics, when the geometry reduces solution flow over the surface e.g. fine blind holes, plates close together, fine matrix structures. The geometries mask themselves so the energy from flowing solution is reduced and the ultrasonics compensate.

Finally, particles tend to be more strongly attracted to a substrate the smaller they are. So, for very small particles, large, localised cleaning energy is very helpful. Ultrasonics can provide this energy which is why ultrasonics are so popular for applications with stringent cleanliness specifications.

Having identified ultrasonics as a useful part of your cleaning process, you then need to decide what frequency. 25 khz is the most common frequency used in industrial applications and the most powerful commonly available as the lower frequencies create bigger bubbles with a bigger bang on implosion. However, if you are targeting smaller particles, you need to adopt higher frequencies. 40 kHz is also quite popular for engineering applications needing high cleanliness standards. More exacting applications, such as cleaning silicon wafers, may opt for very high megasonic frequencies.

Although ultrasonics are very useful for these applications, in general they form only part of the process. In most engineering applications you will have a mix of contamination, oils or coolants, metal swarf and dust, packing materials etc. As such the most efficient cleaning process can comprise a mix of techniques, spray, immersion and ultrasonics with careful chemical selection.

Combining all these potential process elements into one cleaning system that delivers consistently high standards while processing industrial volumes and keeping process fluids in condition is a real challenge.

John Pattison, managing director at MecWash Systems Ltd, who specialises in building high performance industrial aqueous cleaning systems, comments: “Many people think of a line of dunk tanks

when they think of ultrasonics. Although this may work for some low volume or scientific applications, it is rarely ideal for an engineering operation. Such static systems only really work when parts are pretty clean to start with, as there is very little solution movement over the parts and the systems often have limited ability to maintain themselves e.g. removing swarf or oil from the process chamber so you can't run them 24/7 without repeated maintenance.

"At MecWash we specialise in high specification cleaning for engineering businesses, in high precision sectors, hydraulics, aerospace, automotive, precision engineering and medical. We integrate ultrasonics into our systems so you can have spray, immersion and ultrasonic wash and rinse processing, plus hot air and vacuum drying using one process chamber, giving an integrated process in a compact machine. Like all our systems these are designed for 24/7 use and can manage the solutions through filtration, oil separation and coolant removal.

"Our MWX systems hold four ultrasonic rod transducers which can be single or mixed frequency, so you can run both 25kHz and 40kHz, depending on the contamination targeted. With the MWX series, the basket rotation or oscillation eliminate dead spots and this gentle movement allows solution to continuously pass over the surface and contamination falls away. Our systems can provide up to 20 watts/litre in the MWX400 and 30 watts/litre in the MWX300 at 25 kHz.

"Basically, we take the ultrasonic concept and make it work for the production environment. Building ultrasonics into one of our trusted, robust systems, that are used by blue chip engineering businesses around the globe. MecWash customers from automotive, aerospace, fluid power, precision engineering and medical industries are becoming increasingly insistent on the addition of ultrasonics to their bespoke machines and for good reason," says John Pattison.

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.

World class parts washing technology

MecWash parts washers are used in the aerospace, automotive, defence, general engineering and medical industries. It specialises in achieving high cleanliness standards for components with intricate geometries, difficult substrates or tenacious contaminants. Its parts washers support the full range of engineering processes, including machined castings, forgings, turned parts, pressings, extrusions and mouldings.

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Solukon SPR-Pathfinder software helps clean complex parts in record time

Unveiled in November 2022, Solukon SPR-Pathfinder® software is a direct response to the increasingly complex nature of 3D-printed metal parts.

With the ever-growing complexity of powder-based applications, the demands on industrial depowdering also grow. To help resolve this, automated depowdering experts and Turbex partner, Solukon, introduced its Digital-Factory-Tool in 2021. It is a combined sensor and interface kit aimed at improving quality assurance and automation integration.

In late 2022, Solukon took another huge step in the development of intelligent depowdering with SPR-Pathfinder software.

What is SPR-Pathfinder and how does it work?

To help effectively remove excess powder from complex internal structures, the software uses a build job's CAD file to calculate the optimal motion sequence for the machine to use. With this ideal path calculated, the powder is able to flow out completely.

SPR-Pathfinder uses a part's digital twin to optimise post-processing. Calculations are based on a flow simulation that analyses this digital twin. The motion sequence is then read by the Solukon system, which in turn runs the programmed paths.

The result? Expert cleaning of even the most complex parts, all in record time and all without any human programming. "In contrast to conventional manufacturing processes, 3D printing uses the part's digital twin. To date, however, this was only utilised during the printing itself. With SPR-Pathfinder, the part's digital twin can now also be used during depowdering. This is how we ensure that the potential of the digital twin can be used to the fullest in post-processing as well," says Andreas Hartmann, CEO/CTO of Solukon.

Developed in tandem with technology giant Siemens

SPR-Pathfinder started life as SiDAM, a joint technology project and software co-developed by Solukon and Siemens technology.

The initial idea for the software was developed by Dr Christopher Kiener, principal key expert on functional design for manufacturing at Siemens Technology. According to Dr Kiener, "vibration-excited powder behaves almost like a fluid when it flows out". It was this idea, he says that led to the realisation that path identification and particle and flow simulation would help increase depowdering efficiency.

After acquiring exclusive rights to the software and developing it into a Solukon product, licences for SPR-Pathfinder are now available for Solukon customers to purchase.

"It's a logical step for us to license the depowdering software exclusively to Solukon", says Dr Gerog Bodammer, senior venture director at Siemens Technology Accelerator. "This way, customers can get everything from a single source: the market-leading depowdering system and the exclusive, intelligent software."

Testing the software

Before Solukon launched the product to the market, several pilot customers, including Siemens Energy in Berlin, helped test the effectiveness of SPR-Pathfinder.
The AM team at Siemens Energy Berlin manufactured hot parts in series and used a Solukon SFM-AT800-S for depowdering prior to the testing. According to the AM team, the technology helped to both ensure cleanliness and save time.

"With SPR-Pathfinder, we can depowder in series without any manual programming. The parts are guaranteed to be clean and this guarantee, in turn, allows us complete freedom in part design. Furthermore, we save a lot of time, which we can then dedicate to other value-adding activities in the manufacturing process," says Julius Schurb, project leader for IDEA (Industrialisation of Digital Engineering and Additive Manufacturing) at Siemens Energy.

Can I use SPR-Pathfinder?

SPR-Pathfinder is currently only compatible with the SFM-AT800-S and SFM-AT1000-S. Solukon plan to extend compatibility to other models in the future, including the AT350.

The software runs on your company's PCs, not the Cloud. Each license is bound to an individual device.

SPR-Pathfinder works in five simple steps:

1. Upload the CAD file in .STL format to SPR-Pathfinder.

2. Set calculation parameters, including information on the material and desired waiting times for directions of motion.

3. Specify file storage.

4. Start the calculation.

5. Transfer the cleaning program to the Solukon system via USB or OPC UA (optional).

What's next?

Solukon offers a free 30-day trial of SPR-Pathfinder. If you're interested in seeing how the software works for yourself, get in touch with the team.

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Aqueous and solvent cleaning

Partners in cleaning technology

In the world of industrial cleaning, aqueous and solvent cleaning systems both have their advantages. The process and customer requirements will determine the most suitable and effective method.

Aqueous cleaning solutions ranging from fully-automated ultrasonics cleaning lines to stand-alone rotary spray washers can be an eco and user-friendly solution to many typical industrial cleaning applications. The benefit an aqueous process can offer is its versatility on many different types of contamination, polar/inorganic contaminants with acid detergents, non-polar/organic contaminants with alkaline detergents.

However, high-quality and throughput demands can result in aqueous cleaning lines quickly growing into large systems due to the number of treatment and rinsing stages required.

This is where the Kemet/IFP range of KP hybrid systems steps in, offering the best of both by combining aqueous and solvent cleaning. These modified alcohol washing machines operate in a complete vacuum treatment cycle to clean finished products from wastage and oily substances without releasing harmful substances into the environment. With the ability to clean polar and non-polar contamination, leaving a spot-free finish and dry components without the need for multiple reverse osmosis and deionised water rinsing stages used on purely aqueous systems, these hybrid cleaning systems are a real breakthrough for many of today's cleaning challenges.

Integrating ultrasound cavitation in a seal vacuum treatment chamber and the use of universal washing liquids and modified alcohols with low environmental impact ensures a perfect degree of cleaning while drastically reducing consumption. The machines can work with a variety of materials and are ideal for high throughput machined components, precision mechanics, automotive, heat treatment, medical, dental, electronics and other applications

The combination of aqueous and solvent-cleaning technologies offers a powerful solution for industries looking to clean their parts and surfaces efficiently and effectively. By working together, these machines can achieve results that would be difficult or impossible to attain with either technology alone.

Aqueous cleaning machines are great for removing water-soluble contaminants, while solvent cleaning machines are ideal for removing oil and grease-based contaminants. By using both technologies in combination, a wider range of contaminants can be effectively removed, leading to cleaner and more efficient parts and surfaces.

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Solvents for parts made of different materials

Future-oriented parts cleaning

The production of high-precision parts with complex interior geometries requires top quality along the entire production chain. In order to be optimally prepared for future cleanliness requirements, a Swedish manufacturer replaced one of its existing solvent cleaning systems. It chose an Ecoclean EcoCcompact fitted with Ultrasonics PLUS, to mention only one of the system's features.

When company founder Willy Loeffel came from Switzerland to Växjö in Sweden in 1956, he brought entrepreneurial spirit, extensive technical know-how in the operation of sliding spindle lathes and high quality awareness with him. He combined these qualities with the Swedish business culture to create a company which has been setting standards in the industry to this day. The business which is family-run in the second generation specialises in machining of small complex precision products for partly critical applications in the fields of medical and power engineering, valve technology and general industry.

Since the beginning, Willo has been experiencing in average two digit growth rates in these business fields. This is why its production area will be extended by approx. 1,500 sq m within the next two years with the construction of a new building.

State-of-the-art machinery including innovative measuring technology for constant production monitoring of precision parts made of different steel alloys, aluminium, titan, copper, brass and plastics among others ensures that even tightest tolerances are observed. "This also concerns parts cleaning where particles and residues of machining oil have to be removed from exterior and interior part contours. On the one hand, the quality of downstream processes such as heat treatment or coating depends on this cleanliness. On the other hand, the observance of defined cleanliness specifications in final cleaning is a must for both potential further processing in validated processes at our customers' and for the function of the parts in the final product," explains Peter Hultkvist, technical manager at Willo.

Higher requirements regarding cleaning quality and process stability

For parts cleaning the company has been using Ecoclean solvent cleaning systems for more than two decades. When the almost 25 years old system was to be replaced, it was clear that the new cleaning system had to meet not only present, but also future cleanliness requirements flexibly and reproducibly.

High requirements have to be met for both the production and the cleaning of complex machined precision parts

"It was important for us that we would be optimally prepared for our customers' future higher demands regarding particle and film-type cleanliness specifications, process consistency and productivity. Maximum process stability as well as being

To meet not only their customers' current but also future cleanliness requirements, flexibly and reproducibly was the one key requirement formulated by the project team regarding the new cleaning system. From left to right: Linda Ohlin, project manager, Håkan Svensson, operator and Peter Hultkvist, technical manager

prepared for automatic data transfer to our MRP were further requirements," explains Peter Hultkvist.

Another criterion was the best possible use of the available production time by optimally selecting the cleaning steps used in the system. The company talked about these issues with several cleaning system manufacturers. The fact that it opted for Ecoclean's EcoCcompact was due both to the system concept and its optional features as well as its good experience with the manufacturer's systems and service as well as advice and support based on their cleaning know-how.

Future-proof investment through high flexibility

The compact solvent cleaning system which only needs 3,200 x 1,600 x 2,450 mm, L x B x H, of space, operates under full vacuum. At Willo's it is used with the hydrocarbons they have been using so far, however it can also easily be operated with modified alcohols, semi-polar solvents, subject to minor

modifications. The company opted for a standard machine configuration with three fully integrated flood tanks for the process steps wash, rinse/rinse or preserve.

Depending on type, parts are supplied in bulk or arranged in part carriers and treated in accordance with one of the ten programs stored in the machine control system and which are currently still selected manually. For interfacing with the company's MRP, the machine is equipped with a future-oriented scanner system with integrated software.

Due to the future-oriented scanner system with integrated software, the cleaning system can be interfaced with the MES at any time

Equipped for fine cleaning

In accordance with the selected cleaning program, the parts can be degreased with vapour before the actual cleaning process. With this technology, the spent solvent is not piped into the flood tank, contrary to common practice, but directly into the distillation unit integrated as a standard feature. This is done to counteract oil accumulation in the solvent. What is more, vapour-degreasing with wash fluid as final cleaning step is feasible.

Ultrasonics PLUS

To ensure reproducible cleanliness results in line with user requirements and increasing demands, the system features the Ultrasonics PLUS option in addition to the standard injection flood wash and ultrasonic processes. In contrast to classical ultrasonic cleaning which takes place under consistent work chamber system pressure, the pressure of the Ultrasonics PLUS process varies and adapts to the part geometry and degree of soiling. Due to these pressure changes, the formation of cavitation bubbles is adapted to the parts requirements so that they also get to interior areas that are not reached with conventional ultrasonic processes. Therefore Ultrasonics PLUS effectively complements classical ultrasonics especially when it comes to parts with complex interior part geometries. Vacuum drying ensures that the parts leaving the machine are completely dry.

The system concept as well as numerous features available as standard options, such as the three flood tanks for the wash, rinse/rinse or preserve process steps, were major decision criteria in favour of the EcoCcompact

The Ultrasonics PLUS feature, complementing the classical ultrasonic process, ensures that contaminants are also reliably removed from complex interior part geometries

Media reconditioning adapted to high cleanliness requirements

The media reconditioning features of the EcoCcompact also contribute to high cleaning quality and process stability. Each tank has a full-flow filtration in the supply and return lines as well as an additional bypass filtration. The combined systems design enables the user to choose filter bags or cartridge filters without having to change the housing. To remove as many chips as possible from the wash fluid after cleaning, bag filters with integrated magnetic separation are mounted in the filtration system of flood tank 1. The other two filtration circuits have cartridge filters which can remove even ultrafine particles from the fluid.

Peter Hultkvist concludes: "We have been using the new EcoCcompact since February 2022 and are achieving cleaning results that will surely be meeting our customers' future demands."

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HS Marston aligns quality parts cleaning with sustainability

HS Marston Aerospace Ltd is renowned for its heat exchangers in the commercial and military market. As part of Collins Aerospace, a unit of Raytheon Technology, the company manufactures a wide array of heat exchangers including plate and fin, laminated, shell and tube, as well as cold walls, cold plates and cooling panels.

Cleaning of heat exchanger components is a quality-critical process step. "The complex geometries make it difficult to get these parts clean and dry which is necessary for the subsequent brazing. Here, even very tiny residue can cause failures which can lead to leakage," explains Andy Lees, site lead, operations.

Today, at its site in Wolverhampton, UK, HS Marston runs three closed machines on the modified alcohol grade DOWCLENE™* 1601 for the cleaning of different component parts. The oldest machine was installed in 2011. Since then, thanks to the high stability of DOWCLENE 1601, not one single bath exchange has taken place.

While HS Marston now has a reliable fleet to deliver efficient and consistent cleaning results, they have been through some twists and turns in their cleaning journey to get to where they are today.

The decade long search for the right cleaning solution

Back in the 90s, HS Marston relied on Trichloroethylene (TRIC) in an open top degreaser for component cleaning. Concerns related to Environment, Health and Safety (EH&S) necessitated the search for an alternative.

For a brief period in 2003, HS Marston experimented with water-based cleaning. Due to staining on parts surfaces and insufficient drying, it became quickly apparent that this would not make for a feasible long-term solution.

Later on, it adopted N-Propyl Bromide (nPB) in a closed cleaning machine. Stability was proving to be a major issue, with roughly 15 percent of the parts cleaned needing to be scrapped.

In 2009, HS Marston turned to Hydrofluorocarbon (HFC) used in an open top degreaser. The fluorinated solvent did a reasonably good job in cleaning, but it was very expensive to run. Solvent spend averaged £50-60,000 per month because of the high solvent consumption. The chlorinated molecule contained in its formula also went against the parent company's plan to prohibit chlorine on their facilities.

Modified alcohol DOWCLENE 1601

It was only when HS Marston discovered DOWCLENE 1601 in 2011 that they could finally put to rest their decade-long search. Based on modified alcohols, DOWCLENE 1601 is a distillable solvent and has a wide range of approvals in the aerospace industry including Rolls-Royce and SAFRAN.

Thanks to its lipophilic and hydrophilic properties, DOWCLENE 1601 can remove oils and greases just as effectively as certain polar contaminations like cooling emulsions or solids such as particles and

abrasives. The solvent is also characterised by low toxicity and good biodegradability.

"We couldn't believe how clean the products came out, and how the quality had improved as such. It was really a revelation," says Andy Lees. The modified alcohol solvent was quickly adopted and used in combination with the company's first vacuum closed cleaning machine.

The SAFE-TAINER™ System ensures safe and sustainable transport, storage and handling of solvents

DOWCLENE 1601 convinced in new round of investment

Business had continued to thrive and in 2016, HS Marston found itself contemplating the acquisition of another cleaning machine.

"We were happy with what we've got, but we still did lots of trials with various machine manufacturers on different cleaning media. We included trials with DOWCLENE 1601 and perchloroethylene too. Part of us thought perhaps we could still convince our parent company to let us use chlorinated solvent. During the trials, we expected perchloroethylene to perform better than DOWCLENE, but actually there was no difference for our specific application," Andy Lees recalls.

While the flammability of modified alcohols had raised some internal concern, the company also recognised that the small risk could be adequately countered by all the proficient safety features modern vacuum cleaning equipment provided.

The final decision fell back on DOWCLENE 1601, to be run on a second new machine, since it was the only available option which could truly satisfy the diverging interests of quality cleaning and sustainability standards.

The proof of the pudding is real savings

For HS Marston, the benefits conferred by its now well-established cleaning process goes far beyond quality cleaning. The company has also been able to make significant financial savings while preserving the environment.

According to HS Marston's own analysis, the efficiency of its parts cleaning helps cut greenhouse gas emissions by around 225 tonnes of CO_2 per year - equivalent to the annual emissions from around 20 cars, or the energy usage of 10 homes per year. Solvent spend is down by at least 50 percent, while cycle times are halved. Rejection rate of parts is only 1 percent and not cleaning related.

Addressing the market perception that water cleaning might be a greener option, Andy Lees concludes: "When you look at the energy costs required to run the machine, the long cycle time anywhere between 60 to 90 minutes and also the energy consumption for drying the parts, it all has a negative impact rather than a positive one. We have done lots of trials with aqueous cleaning and we simply couldn't get through because the process was just far too complicated for our specific application."

"Having had the positive experience first-hand, we'll be looking to drive our subcontract facilities to adopt the same effective cleaning regime as we do as well."

If you are struggling with cleaning challenges, or simply want to re-evaluate your current cleaning setup, do reach out. We would be happy to offer you a free consultation.

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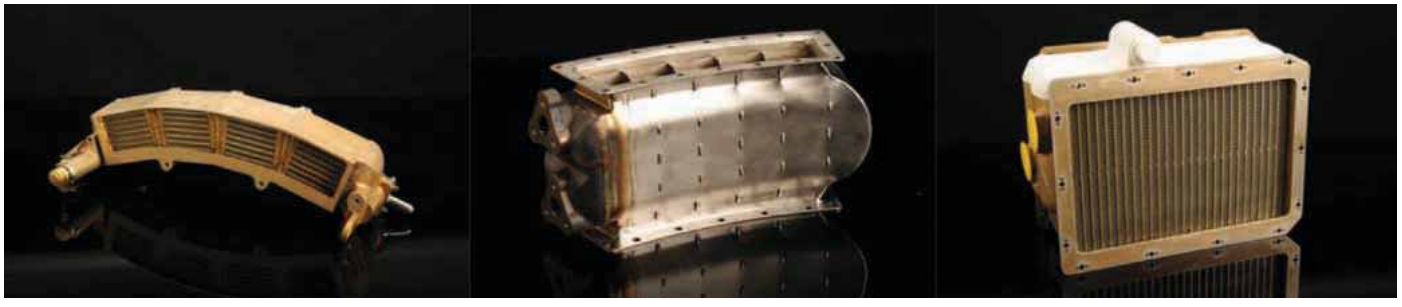


HS Marston is a specialist in the manufacturing of different heat exchangers

30 years of partnership

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

Schnebelt Präzision KG from Schutterwald, Germany, was founded in 1985 as a regrinding company for circular saw blades. Only two years later, Rolf Schnebelt expanded the range to include machine tools which he sold to manufacturing companies as a sales representative. The company's own machinery was upgraded in 1996 with the first state-of-the-art, computer-controlled grinding machine for precision tools. Pat Boland, co-founder of ANCA, inspected the newest ANCA machine FX5 at Schnebelt during a recent visit. Using the ANCA AR300 loader with collet changer, tools with various diameters are now produced and reground automatically and with high precision by Schnebelt.

The companies of Rolf Schnebelt and Pat Boland share a very special history. Schnebelt Präzision KG entered the field of regrinding shank tools with ANCA in 1996, shortly after the ANCA branch was founded in Germany. But why did Rolf Schnebelt decide on an Australian machine back then, when based in Baden-Württemberg, the centre of gravity of machine tool manufacturing? According to Rolf Schnebelt, the search for the right tool and cutter grinder to start the new business segment took some time. The performance of the commonly available machines was not convincing, the controls did not deliver satisfactory results and the transfer of the NC programmes to the machine sometimes took 30 seconds or more. Then they came across the ANCA machines, whose concept was not offered by any other competitor at the time. A powerful control system, user-friendly software and training by the local ANCA experts made the entry into 5-axis grinding possible. "We were particularly convinced by the machine's progressiveness, which showed in the speed of the control, the axis movements and the achievable surface quality," says Rolf Schnebelt.

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

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

Rolf Schnebelt confirms: "I was able to inspect the first ANCA machine for a

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

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

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

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

Jörg Scheidecker, Schnebelt's long-time technical director, says: "Our product range is characterised by the fact that we produce high-performance tools efficiently and in top quality, even in small batch sizes and that we offer our customers considerable advantages through our uncompromisingly quality-oriented resharpening offer.

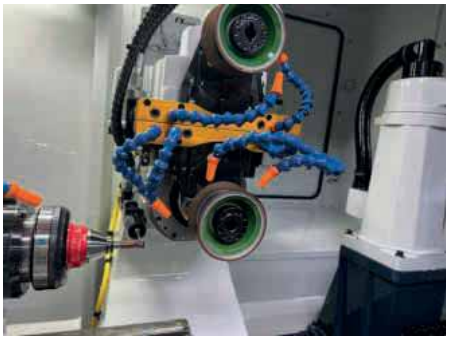
Complex geometries and even small diameters down to 2 mm are no problem for us."

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

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

Another aspect of the AR300 solution used at Schnebelt is the possibility of machining different diameters. In addition to the flexibly applicable software, there is the possibility to change collets. Tools with different diameters are placed in the pallet in collets with identical diameters. A suitable standard gripper on the AR 300 loads the collets into the spindle equipped with a corresponding chuck. This way, the pallet can not only accommodate different batches with identical diameters, but the variance is extended to diameters of 2-18 mm.

"This solution significantly expands the use of the machine and our flexibility in



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

A natural next step would be the introduction of the RFID technology application from ANCA. While at present the tool programmes are assigned to the respective pallet location, the RFID solution offers further flexibility through the use of chips in the respective toolholder and thus enables chaotic loading. "Our entry into automated production has been successful. There is certainly the possibility that we will expand on this" concludes Pascal Schnebelt.

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VOLLMER doubles benefits with new Loroch TWIN

Following the astounding success of two new circular saw blade grinding machines launched by VOLLMER last year, the saw blade sharpening expert has now presented the new Loroch TWIN 860.

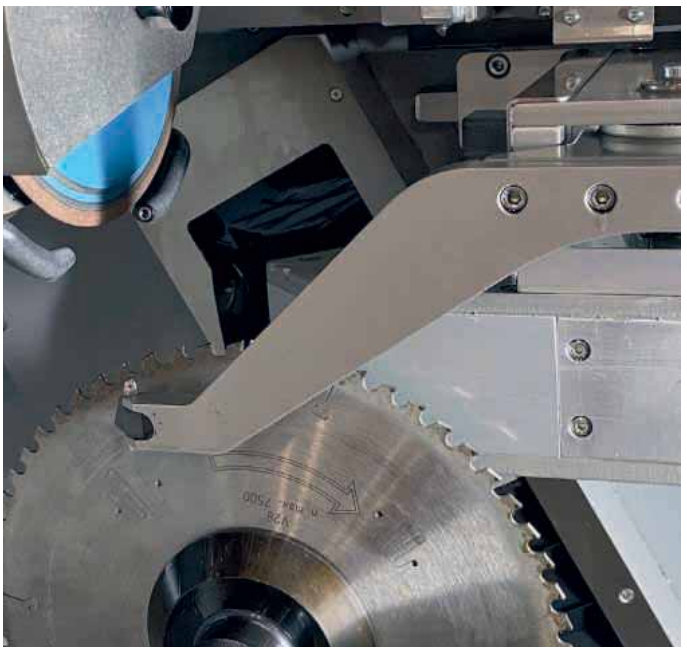
The revolutionary new Loroch TWIN 860 is a space-saving concept with a compact 2,000 by 1,250 by 1,980 mm footprint that introduces two different grinding processes in a single machine tool. This gives the end user a machine that can process both carbide tipped (TCT) saw blades for the wood, sawmill and metal cutting industries, as well as HSS, saw blades primarily used in the metal cutting sectors.

With the introduction of a fifth axis, a vast selection of TCT blades can be processed in addition to the common metal cutting circular saw blades. As with all Loroch machines, the new TWIN 860

machine grinds with the saw blade rotating. In each case, the grinding process consists of a precise, controlled movement of the grinding head and rotation of the saw blade with both axes controlled simultaneously in complete synchronicity.

HSS circular saw blades from 60 to 860 mm can be sharpened and re-cut on the new TWIN 860 machine and automated chamfering is possible from diameters of 75 mm and above. With HSS saws, the rake and clearance angles can be freely selected and this grinding process also permits the processing of solid carbide saw blades, friction saws and TK or TA saw blades such as carbide or cermet tipped thin kerf blades with chip guiding notches. This flexibility provides a remarkable range of opportunities for end users.

For the sharpening of TCT saw blades from 145 to 700 mm diameter, the TWIN 860 has a secondary grinding process whereby the tooth to be ground will remain in a stationary position with grinding performed exclusively by the grinding head. The feeding of



each tooth is undertaken by the ultra-precise centre drive that intuitively identifies any pitch differences in the saw blade and automatically processes any irregular pitch patterns in the saw blades. In both grinding processes, complete machining is performed with only one DIA or CBN peripheral grinding wheel, 14F1, in each case.

The benefits of the new TWIN 860 go far beyond the ability to undertake both fixed position and rotary processing of the HSS and TCT saw blades through its five servo-driven axes and the ability to detect and process different saw blade pitches. The flexibility of the TWIN 860 enables end users to process everything from straight back teeth, peg teeth, friction teeth, curved back teeth with chamfer, solid carbide teeth as well as TK saw blades and tooth shapes that include 301, 302, 303, 304, 311 and many others. The multi-purpose machine also has an exceptionally high angular precision level, which is a benefit of the ultra-stiff machine base that minimises vibration and the extremely powerful blade clamping system, both attributes that enhance surface finishes and edge quality.

Programming is fast and effortless with the touchscreen control that provides easily understandable symbols that intuitively direct the operator through the process. To further simplify operation, the TWIN 860 automatically suggests favourable machining data to guide the user. Furthermore, grinding wheel mounting is automated to minimise setup times. Possible operating errors are reduced to a minimum. For the machining of HSS circular saws, it is possible to pre-programmed saw blades to separate the machine programmer from the operator. The operator only has to clamp the respective saw blade, close the door and press start; another feature that minimises operator errors.

The TWIN 860 offers a chamfering angle of 75° for HSS saws and 145 mm for TK and TCT saws with a tooth pitch of 1 to 40 mm on HSS and TK saws and 6 to 60 mm for TCT blades. The machine is capable of processing chamfer/bevel angles up to 45° and can grind blades with a maximum blade width of 8 mm.

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NUM releases major update to NUMROTO tool grinding software

Features new generation of profile editor, completely revised user administration and a host of new functions

NUM has released a major update to its renowned NUMROTO tool grinding software which includes a host of new functions to further accelerate the productivity of tool grinding machines.

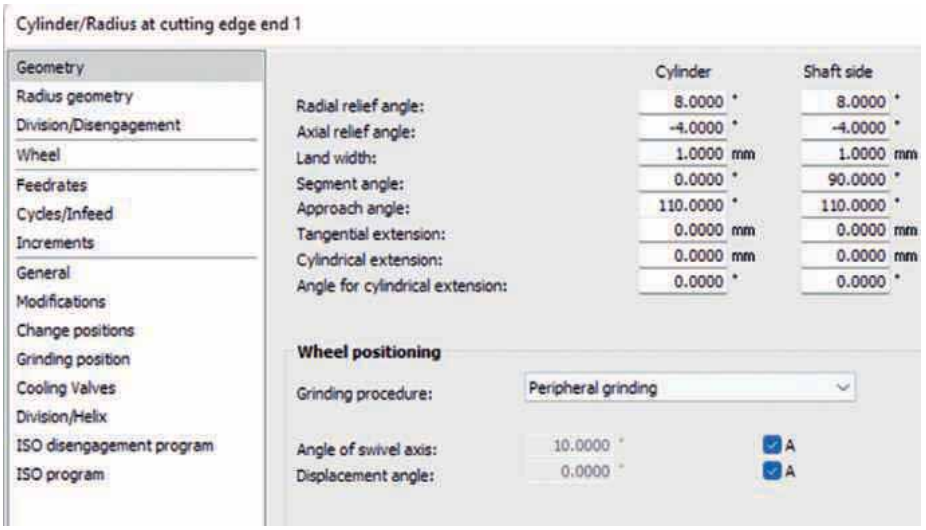
Version 5.0.0 of NUMROTO provides CNC grinding machine users with an unprecedented level of flexibility. It is likely to be of special interest to tool manufacturers seeking to increase their productivity of precision drills, subland step drills, end mills and form tools.

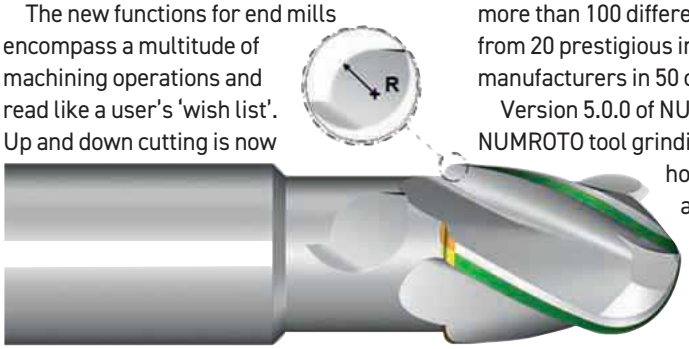
NUMROTO features a true multiuser environment. The new version of the software allows much more detailed definition of user administration rights, to help improve machine management and better protect valuable machining data.

NUM has significantly enhanced the speed, functionality and ergonomics of NUMROTO's profile editor. The new Profile Editor X enables contour lines and radii to be drawn using a computer mouse, with all elements clearly displayed in tabular form and with one-click sizing information. When importing a DXF file, all existing layers are displayed in a preview window. Profile Editor X also offers a spline to polyline conversion facility, enabling splines to be read in and automatically converted to segmented lines with a maximum user-specified tolerance.

NUMROTO 5.0.0 introduces two new functions for machining drills and step drills and no less than seven new functions for end mill production. When using a peripheral grinding wheel for chamfer relief of a drill, the inside or outside edge of the wheel can be selected. And at the end of a clearance relief operation on a drill, it is now possible to program a disengage chamfer.

The new functions for end mills encompass a multitude of machining operations and read like a user's 'wish list'. Up and down cutting is now possible and employs a simplified geometry dialogue. New functions are available to simplify the cutting of S-shaped and straight chisel edges, and with separate increments for ball relief chisel edges. A radius can now be ground at the end of the cutting length. Separate feed rates can be programmed for the grinding wheel engagement and disengagement slants and the cutting and displacement angle of relief operations can now be individually programmed for groups of teeth.





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-sharpening of tools such as end-mills, drills, step drills, form cutters and many others. Compared to most competitive products on the market, the software provides a much more direct and efficient path between tool design, manufacture and verification.

NUMROTO software is currently used on more than 100 different types of machines from 20 prestigious international manufacturers in 50 countries worldwide.

Version 5.0.0 of NUM's renowned NUMROTO tool grinding software offers a host of new functions to accelerate production of precision tools, including this one which enables a radius to be ground at the end of the cutting length of end mills

Peter von Rüti, president and CEO of NUM Group says: Our main CNC hardware production facility is located in Italy. It is our clearly defined strategy that we keep the control over the development and manufacture of the core products in the CNC system, including the drives and motors, in our hands, so that we remain capable to continuously improve the overall performance of a CNC system. Beyond our catalogue offering, with the support of NUM's engineering services, we are also able to propose third party products, for the realisation of your unique solutions. This is done in close cooperation with our partners, which makes NUM a provider of high end CNC solutions where customers actually get everything from one source. The success of our partners and customers is our metric for success and the direct justification of our position in the market.

"The total cost of operations are becoming increasingly challenging for our OEM customers and end users. For this reason we are very much committed to the highest product quality and reliability in combination with an efficient and responsive worldwide customer service."

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Horizontal blasting of liquid gas storage tanks

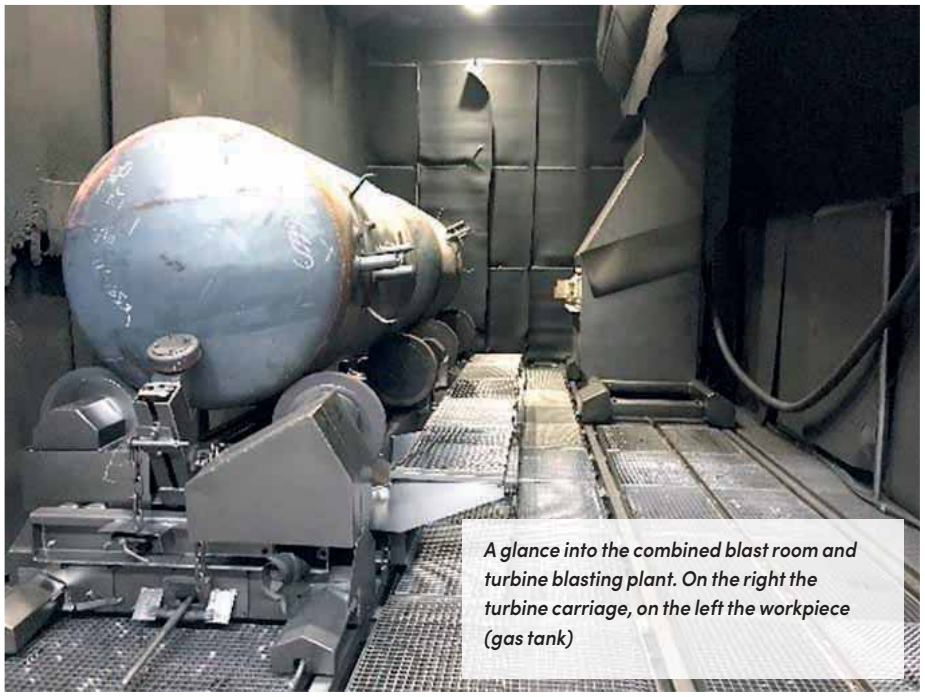
AGTOS, the shot blast technology expert, has gone through a very eventful history. In the process, it has always been possible to expand its market position, so that in the meantime almost all well-known gas suppliers are on the customer list. Below a blasting operation is shown which is rarely realised. The horizontal installation of the AGTOS high-performance turbines was implemented so well that the existing plant can be operated much more economically than before.

Of course, in addition to various product-related certifications, the company has a certified QA system according to DIN EN ISO 9001 and UM system DEN EN ISO 14001. The blasting process is essential for cleaning and roughening the workpiece surfaces before coating. For this purpose, the company has been operating a combined blast room and turbine blasting plant for years.

Workpieces (gas tanks) after blasting. The bottoms are also optimally cleaned

The gas containers to be processed are moved to the blast room on a rail wagon and processed there by two turbines also mounted on a rail wagon. These are AGTOS high-performance turbines, each with six blades attached to a single-disk blasting impeller. This system has the advantage over the previous one - it has better materials and fewer wear parts that need to be replaced due to the process.

The blades throw the cast steel abrasive at high speed onto the containers, which rotate slowly around their own axis. The abrasive is collected in the lower section of the blast machine, cleaned and fed back to the turbines via a conveyor belt.



A glance into the combined blast room and turbine blasting plant. On the right the turbine carriage, on the left the workpiece (gas tank)

The special feature is that the turbines are arranged horizontally, whereas in conventional blast machines they are mounted vertically. This fact places new demands on the inner workings of these components, especially on the seals of the motor bearings.

After the turbines of the blast machine, in particular, had previously caused high repair costs, AGTOS replaced them with new, horizontal high-performance turbines. Thanks to the experience gained with other customers, these were developed in such a way that they are durable and work reliably.

From now on, the replacement of turbine motors and all wearing parts can be drastically reduced. The turbine now runs reliably and economically.

The existing saddle plate on which the turbines are mounted was completely replaced. A threaded spindle allows the angle of inclination of this saddle plate to be adjusted by means of a rotary axis. This also allows the turbine jet to be adjusted to the horizontal centre of the gas tanks. A necessity, as these vary in diameter from

A glance at both AGTOS high-performance turbines

600 to 1,400 mm. The new saddle plate has also been further developed into a wedge saddle. From now on, the sides and also the bottoms of the tanks are processed more effectively. This is because the turbine jet now hits the rounded bottoms at a more pointed angle. This considerably reduces the need for manual blasting of the bottoms.

Wear-resistant guiding plates additionally direct the turbine jet in such a way that the abrasive hits the workpieces directly. No abrasive can miss. The rubber lining of the blasting chamber is therefore optimally protected. This means that it too can continue to exist in a more sustainable and cost-effective manner.

This described modernisation took place in 2019. Since then, the new concept has proven itself and worked to the customer's advantage.

Around 20 years ago, a group of specialists established AGTOS. Together with numerous highly-qualified colleagues, the AGTOS team was formed. It has been an important player in the market since October 2001.

It is driven in its endeavours by a vision of achieving competence leadership in the area of turbine-wheel shot blasting technology. Its mission statement and associated strategies are based on this vision.

Its team has an enormous wealth of expertise in the areas of development, design, manufacturing, distribution and servicing of shot blasting systems and shot blasting machines.

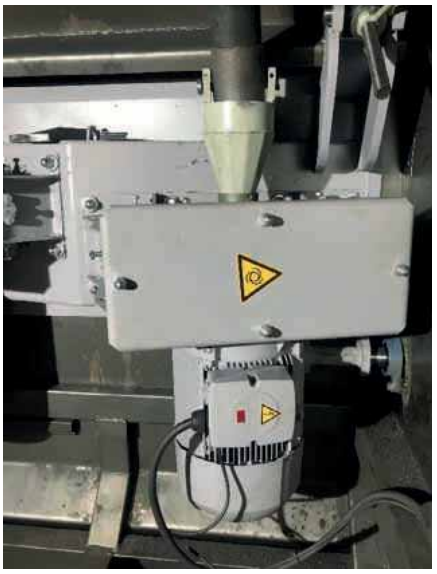
Modern production in its own plant in Poland, a comprehensive warehouse at its headquarters in Emsdetten, optimised processes and a horizontal organisation structure and, no less important, a high level of commitment enable the company to achieve the efficient manufacture of machines and systems with consistently high quality and all the services associated with shot blasting technology.

AGTOS provides turbine-wheel shot blasting plants tailored precisely to meet the needs of customers. It places a particular emphasis on perfect service, not only for AGTOS shot blasting machines, but also many other manufacturers.

Solutions and concepts

It develops the perfect solution for customers on the basis of their surface quality specification, internal logistics and the spatial conditions involved.

The decisive factors are the economic efficiency and operational reliability of the process. AGTOS employees have years and even decades of experience in the peculiarities of shot blasting technology. This, combined with modern concepts and design methods and innovative ideas, enables it to present optimum suggestions for your operations. A well-equipped test centre with several shot blasting machines allows AGTOS to demonstrate real shot blasting results. It always looks forward to embracing new challenges.



A glance at one of the two horizontally mounted AGTOS high-performance turbines

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ActOn Finishing shot blasting technology for high-performance surface finishing solutions

ActOn Finishing is a UK-based manufacturer of shot blasting machines and surface finishing equipment. With over 50 years of experience, ActOn Finishing has built a reputation for providing high-quality, reliable and cost-effective surface finishing solutions to various industries such as aerospace, automotive, medical and manufacturing.

ActOn Finishing's shot blasting machines are designed to provide efficient and consistent surface preparation, cleaning and finishing. The company offers a range of shot blasting and wheel blasting machines to suit various applications and requirements.

ActOn Finishing shot blasting machines

Shot blasting is the process of propelling abrasive media, by using compressed air, through nozzles and onto the surface of the component. It can be used to descale, remove corrosion, paint and rust, for smooth finishing, polishing or to strengthen the metal. Depending on the finishing requirements, the shot blasting process can be wet or dry. ActOn Finishing offers both wet and dry shot blasting machines.

Mobile Blasting Systems

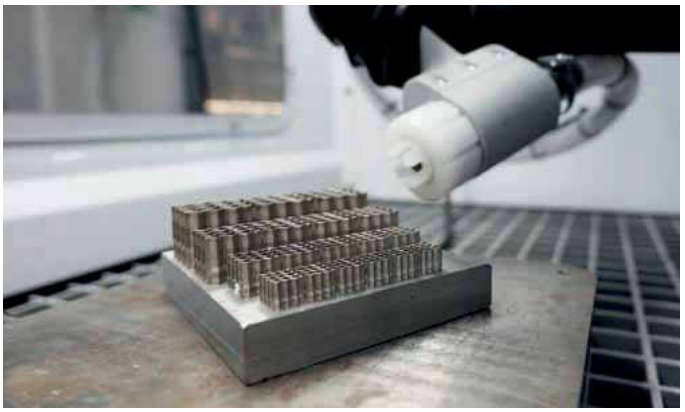
Includes three models: Powertrack Junior, Powertrack and a Mobile Blast Room. These blasting machines will offer the perfect balance between productivity and portability. Some of the main advantages of the Mobile Blasting Series include: designed for a wide range of applications, including metal and stone finishing; are economical and easy to operate and easy to move.

Blast cabinets

ActOn Finishing's blast cabinets are designed for manual or semi-automatic blasting of small to medium-sized parts. From economical suction and pressure blasting cabinets to premium range and wet blasting cabinets, ActOn Finishing offers a wide range of solutions. These machines are built to descale, remove corrosion, mill scale, paint or rust, achieve a smooth finish, deflash, polish or strengthen the metal.

DLyte eBlast cabinets

The DLyte eBlast, manufactured by GPAINNOVA, uses electro blasting technology. The process involves pressurised solid-electrolyte particles propelled by a non-conductive liquid



media which is applied to component surfaces for various cleaning or finishing effects. The Electro Shot Blaster is perfect for surface finishing parts with intricate shapes and for achieving a mirror finish, in a short period of time.

Automated shot blasting equipment

ActOn automated shot blasting cabinets and equipment reduce manual handling and ensure a consistent process. These automated systems are operator friendly and can be custom built to suit your needs.

Benefits of ActOn shot blasting technology

ActOn shot blasting cabinets offer several benefits over other surface preparation techniques:

Efficiency: ActOn Finishing's shot blasting machines are designed to provide efficient and fast surface preparation and finishing, reducing production time and costs.

Consistency: produces a consistent profile on the surface, which improves the adhesion of coatings and paints.

Environmentally-friendly: generates less waste than other methods, making it a more environmentally friendly option.

Versatility: can be used on various materials such as metals, concrete, and even wood. Safety: is a safer option than other methods that involve chemicals or dust, as it does not create hazardous fumes or particles.

Customisation: ActOn Finishing's shot blasting machines can be customised to suit specific applications and requirements, providing a tailored solution for each customer.

Quality: these shot blasting machines provide consistent and high-quality surface finishing results, improving the overall product quality.

Durability: ActOn Finishing's shot blasting machines are built to last, with high-quality materials and components ensuring a long lifespan and minimal maintenance.

ActOn Finishing wheel blasting machines

Wheel blasting is a surface preparation technique that uses a high-speed rotating wheel to propel abrasive particles onto a surface. The abrasive particles can be made of various materials such as steel shot, grit, sand, or glass beads, depending on the application and desired finish. ActOn Wheel Blasting technology is used by various industries such as automotive, aerospace, construction, manufacturing and metalworking for surface cleaning, deburring, descaling, rust and paint removal and surface texturing.

Here are just a few types of wheel blasting machines offered by ActOn:

Tumble Blast Machines: ActOn Finishing's tumble blast machines are designed for the batch processing of small to medium-sized parts. These machines feature a rotating drum that tumbles the parts, ensuring even and thorough blasting.

Belt Conveyor Blast Machines: ActOn Finishing's belt conveyor blast machines are designed for the continuous blasting of large and heavy parts. These machines feature a conveyor belt that carries the parts through the blasting chamber, ensuring consistent and efficient surface preparation.

Spinner Hanger Blast Machines: these blast machines are designed for the blasting of large and heavy parts. These machines feature a rotating hook that suspends the parts in the blasting chamber, allowing for efficient and thorough blasting.

Rotary Table Blast Machine: suitable for shot blasting small and medium size parts. This installation is provided with a variable speed drive controlled turbine and a turntable, which has a diameter of 2,500 mm.

Tunnel Concrete Shot Blast Machine: designed for surface treatment of marble, granite, natural stone, concrete and aggregate blocks to obtain a bush-hammered, flame treated, antique appearance finishing. STL offers a high productivity with very low operating costs, when compared to commonly used traditional systems. It is also possible to simultaneously treat the top and side surfaces of the component.

Benefits of ActOn wheel blasting technology

ActOn wheel blasting cabinets offer several benefits over other surface preparation techniques:

Speed: Wheel blasting is a high-speed process that can prepare surfaces quickly and efficiently, reducing production time and costs.

Consistency: Wheel blasting provides consistent results, ensuring a uniform finish and product quality.

Versatility: can be integrated in your production line. Moreover it can be used on various materials such as steel, aluminum, and plastics and can prepare surfaces for different applications such as coating, painting, or bonding.

Precision: can be adjusted to provide precise surface preparation, allowing for specific roughness and texturing requirements.

Safety: can be conducted in an enclosed and controlled environment, reducing the risk of accidents and exposure to harmful dust and debris.

Quantity: it can handle large batches of parts, big components and high throughput.

What customers' say?

Tony Darby, production manager Special EFX Ltd states: "After Care was very good. Any problems we had, they are at the other end of the phone. They were helpful with the installation of the machine. I would recommend ActOn due to the professionalism of their team, the quality of the cabinets they provide and for the friendliness and helpfulness they provided during the purchase."

ActOn Finishing's shot blasting and wheel blasting machines provide high-performance, reliable, and cost-effective surface preparation solutions for various industries. With a range of machines to suit different applications and requirements, ActOn Finishing can provide a tailored solution for each customer. Whether you need to prepare a surface for coating, remove rust and paint, or clean and deburr parts, ActOn Finishing's wheel blasting machines offer an efficient, consistent, and safe solution.

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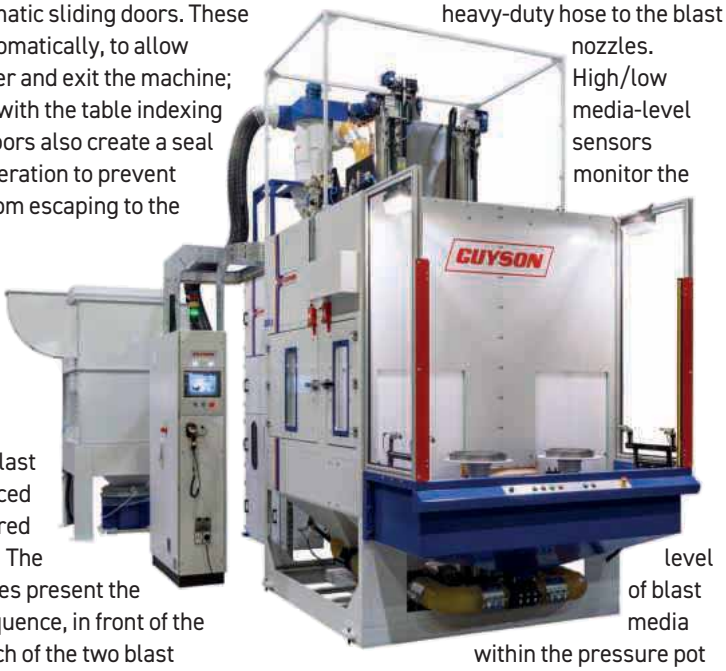
Automated blast system for high productivity metal finishing

Guyson International, the UK leading industrial finishing equipment manufacturer, has recently added the Guyson Multiblast® RXS1400 automated blast system to its portfolio of rotating indexing spindle systems. Ideally suited for the complete surface treatment of components that can be blast finished or shot-peened whilst rotating about one axis. Guyson's largest standard indexing system can handle components with a maximum component size of 400 mm height x 400 mm diameter and a weight of 25 kg. The blast system is perfect for medium to high volumes of automotive transmissions, aerospace and land-based turbine components, railway, wind and construction equipment and substrate materials in metal, composite or exotic alloys.

The Guyson Multiblast RXS1400 machine is a six spindle rotating indexing blast system that can process multiple parts simultaneously; having two blast stations, making it extremely suitable for high volume manufacturing. The six work spindles are equally spaced around the perimeter of the rotary indexing table and arranged so that at all times two of the spindles are outside the blast machine during the blasting operation for loading and unloading. Due to the rapid table indexing of the RXS1400, the load/unload environment is generally protected with a light-guard failsafe safety device.

Guyson International sales manager, Ian Rayner states: "The RXS1400 blast system is a great new addition to our already extensive range of automated blast solutions, which also includes the smaller RXS400 and 900 options, RSB rotary table machines, T40 & T50 tumble basket and in-line tunnel blast machines. This new equipment can be specified as either suction fed or pressure fed with the choice being directed by the application and throughput requirements."

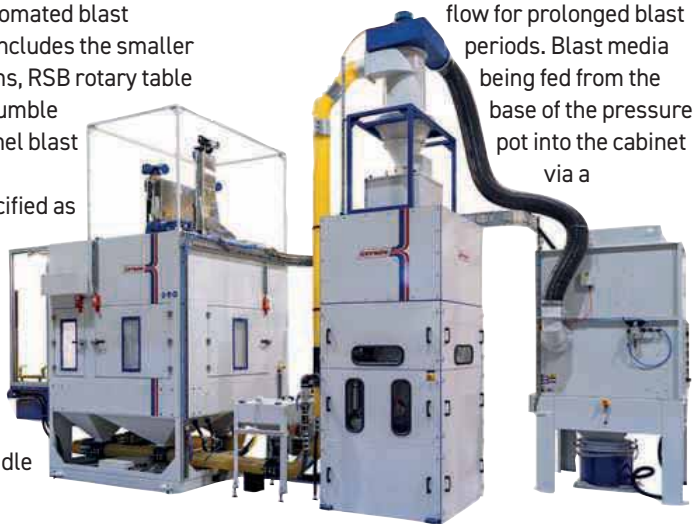
Parts are loaded onto the left-hand spindle and enter the blast chamber via pneumatic sliding doors. These open and close automatically, to allow components to enter and exit the machine; and are interfaced with the table indexing mechanism. The doors also create a seal during the blast operation to prevent media and noise from escaping to the work environment.



Inside the blast chamber, the dual blast station design can feature fixed or vertically traversing guns to provide optimum blast coverage and reduced TAKT times compared to manual blasting. The two rotating spindles present the components, in sequence, in front of the blast nozzles at each of the two blast stations. This ensures uniform coverage for a superior, repeatable, controlled finish required by industries such as aerospace, automotive and medical.

After blasting, components enter a post-blast airwash chamber where compressed air is directed at them to remove any residual dust or blast media and are ready for the next stage of production.

Blasting can be either suction or pressure fed, as on all Guyson automated blast equipment. If pressure fed, with high component volumes, blasting is delivered through a pressure pot, often a 300 litre twin-chamber pot, allowing for a continuous flow for prolonged blast periods. Blast media being fed from the base of the pressure pot into the cabinet via a heavy-duty hose to the blast nozzles. High/low media-level sensors monitor the level of blast media within the pressure pot and a media reservoir above the pot keeps the pressure pot replenished with media when required without interruption.



After blasting, the used blast media is extracted via a Guyson cyclone reclamator which separates the re-usable blast media from dust, blast debris and undersized media. In some applications, when using a dense metallic blast media, the cyclone reclamator is replaced by an auger screw and bucket elevator.

Options also exist for media conditioning and monitoring, which include vibrating sieve media size control, media roundness classifiers, and electronic shot flow control. These are often essential for applications with demanding quality standards such as the aerospace shot peening standard AMS 2432. The extraction system is completed with a selection of cartridge dust collection units matched to the machine and media volumes.

The entire blast system is controlled via a PLC/ 'Graphic Operator Terminal' (GOT), with a full-colour display screen, which facilitates repeatable blast settings to be simply stored and retrieved in quick access menu systems.

The prospective user of Guyson automated blast systems is encouraged to submit sample components for free feasibility testing to the company's

extensive 'Component Finishing Centre' at Skipton, England.

Guyson blast cabinet hits the target

Guyson International, the UK industrial finishing equipment manufacturer, has recently installed a Guyson Euroblast® 7PF (Pressure Fed) blast system into Merlin Archery, a leading designer and manufacturer of tournament shooting archery bows. The blast cabinet is used to deliver a uniform bead blasted cosmetic surface finish on its range of machined compound bows and to enhance the surface topography of components before anodising.

After successful blast trials to meet the surface finish requirements conducted at Guyson's Skipton headquarters and manufacturing site, which has remained open and fully working throughout the pandemic, Ben Jones the owner of Merlin Archery, was happy to sign off on purchasing the new blast system.

The chosen Euroblast 7PF blast system is from Guyson's premier industrial quality range and delivers exceptional component access, with doors opening to the front, top and side, and facilitates easy loading of components into the internal blast chamber, which in this instance has the width of 1,480 mm to accommodate the longest of the CNC machines aluminium compound bow parts.

Merlin Archery's blast system comprises a Guyson Euroblast 7PF blast cabinet, Model 75/16 Cyclone Reclamator, G27 Pressure Pot and Guyson C400 dust collection unit and delivers fast (up to four-times faster than suction fed systems), effective blast finishing on a vast array of components. Large armhole sleeve/glove assembly allows the operator greater flexibility of movement when blasting and external roof-mounted LED lighting coupled with light coloured rubber curtain lining offers additional cabinet protection and good contrast for parts visibility.

The 27-litre capacity pressure pot, is used to generate the blast stream within the blast chamber and when the full-width foot pedal (so can be operated by either foot) is depressed it pressurises the pot and starts the blast operation; similarly releasing the pedal de-pressurises the pot and stops the process.

Blast media is fed from the pressure vessel into the cabinet through a heavy-duty hose to the blast nozzle, the flow of media being controlled by a manual pinch valve mounted on the cone of the pressure pot which regulates the volume of media being released into the compressed air stream.

The 75/16 cyclone reclamator is used to separate re-usable media from the dust, blast debris and undersize media. It does this by extracting everything from the bottom of the blast cabinet. The lighter particulates are drawn off to the dust collection unit, the heavier re-usable blast media flows back to the pressure pot, thus reducing the possibility of contamination by abraded particles and debris in the media which could reduce the consistency of finish. A trigger operated airwash gun is supplied as standard for post-blast removal of dust/residual media from the components.

The whole system is completed with a Guyson C400 dust collector, a highly efficient unit for filtering out and collecting the dust-laden air from the blast cabinet using a single cartridge filter. The heavier extracted particles being deflected downwards towards the collection bin, the lighter particles are captured on the surface of the filter. Any larger pieces of debris removed by blasting are captured in the blast cabinet by the heavy-duty perforated steel floor and a secondary perforated steel floor in the hopper captures smaller pieces of debris, thus reducing blockages in the blast hose/blast gun.

If you would like to improve the surface finish of your parts before anodising, powder coating, plating or any other type of surface finishing, contact Guyson's Customer Service Department now to arrange free 'try before you buy' blast trials on your components, prove the process and make recommendations on the most suitable cabinet for you.

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"Smart Abrasive" system lowers energy consumption, blast media usage and equipment wear

New continuous flow shot blast machines with adjustable power input minimise the consumption of energy

At GIFA 2023, the International Foundry Trade Fair with Technical Forum to be held on Germany in June, Walther Trowal will introduce the "Smart Abrasive" option in its THM troughed belt continuous flow shot blast machines. The "intelligent" control of the media flow drastically reduces the energy consumption and significantly extends the usable life of the blast media as well as of the entire shot blast machine. To ensure perfect blast cleaning results on all workpieces, large continuous flow shot blast machines normally work with a surplus of blast media. This results in higher energy consumption.

To eliminate this waste of energy, Walther Trowal developed the "Smart Abrasives" option for its THM 700 and 900 shot blast machines, which are equipped with up to four turbines. It adjusts the media flow rate in the entire media recycling system to the blast cleaning requirements as well as the shape and size of the workpieces. If a particular blast cleaning process requires a lower blast performance, the system reduces the media flow through the turbines and the RPM of the augers.

The "Smart Abrasive" system significantly lowers the energy consumption in the troughed belt continuous flow shot blast machines THM 700 and THM 900

This innovative control system saves not only energy. Since less media is passing through the shot blast machine, it also reduces the media consumption. In addition, the overall uptime of the shot blast machine is increased and the amount of required work for maintenance is decreased.

With suitable processing trials the optimal shot blasting parameters, such as turbine RPM, media flow rate, etc., are defined for each individual workpiece type. Based on these data processing programs are created, which are then stored in the PLC of the machine controls.

Typical applications for the THM machines are automotive components, for example, chassis parts made from aluminum like transverse links, swivel bearings or steering knuckles. For the surface refinement of these light-weight workpieces the manufacturers are increasingly using aluminum blast media. It allows to make the entire blast cleaning process particularly gentle.

Meik Seidler, sales manager for mass finishing and shot blasting at Walther Trowal, expects a growing demand for shot

The Trowal test and training center is equipped with several THM shot blast machines that can be used for processing trials with the customers' workpieces

blast machinery that can handle the high workpiece volumes typical for the automobile industry: "With the increased production of hybrid and electrical cars more high-strength chassis components will be required. Since such vehicles have a higher weight and require a higher torque in their drivetrain, the components must be more resistant against tensile and bending stress. For these applications the THM shot blast machines with the "Smart Abrasives" control system represent a highly economical solution."

The THM troughed belt continuous flow shot blast machines

The THM shot blast machine can handle high volumes of bulk goods as well as large and delicate components with complex shapes. Especially for processing delicate workpieces the THM continuous flow machines offer numerous advantages: The workpieces are evenly spaced across the entire length of the troughed belt. For this reason, they are not colliding but may simply touch each other. Moreover, they are not falling on top of each other but gently tumble over the polyurethane coating of the transport rods. The innovative troughed belt transport system ensures that the finished workpieces are discharged from the machine without any nicking or scratching.

Surface finishing technologies

Since 1931, Walther Trowal has been developing and producing systems for the refinement of surfaces. Initially focusing exclusively on mass finishing, the term "Trowalizing" originated from the company's cable address "Trommel Walther". Walther Trowal has continuously expanded its product portfolio.

Over time, the company has developed a broad range of machinery and systems for mass finishing, shot blasting and coating of mass-produced small components. With the invention of new systems like, for example, drag finishing and the development of special finishing methods for 3D printed components, the company has proven its innovative capabilities again and again.

Walther Trowal develops and implements complete surface treatment solutions that can be seamlessly integrated into linked production systems existing at the customers. This includes the entire process technology, perfectly adapted to the specific surface finishing requirements of the workpieces: Equipment and the respective consumables always complement each other in a perfect manner.

Each individual workpiece and each manufacturing process must meet special technical requirements. That is why the experienced process engineers in our test and training center, in close cooperation with the customers, develop the optimal process technology for the finishing task at hand. The result: Workpiece surfaces that exactly meet the required specifications with short processing times and a high degree of consistent, repeatable results.

Walther Trowal is one of the few manufacturers who develops and produces all machines and mass finishing consumables in-house including ceramic and plastic grinding and polishing media as well as compounds. The company's equipment range also includes all kinds of peripheral equipment for handling the workpieces like lift and tip loaders, conveyor belts and roller conveyors, in addition, special driers for mass finishing applications and, last-but-not-least, systems for cleaning and recycling of the process water.

With its exchange program for wear items like work bowls, which are part of a continuous recycling program, Walther Trowal conserves valuable resources and, thus, makes a significant contribution towards sustainability in the field of industrial production. Quick technical support and the global repair and maintenance service ensure high uptimes for our equipment.

Typical applications for the THM shot blast machines are forged chassis components made from aluminum like transverse links, swivel bearings or steering knuckles. They are equally suitable for high volumes of mass-produced aluminum die-castings

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We are a highly valued supplier of products and services to a wide range of engineering companies whose areas of expertise cross all industries. We are your partner for providing truly innovative, economical, efficient and world class forward thinking solutions to give you the crucial competitive advantages that you need to ensure manufacturing success.

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