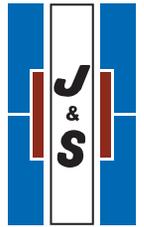


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The home of high precision

Having spent the previous decade at the heart of the Jones & Shipman / Hardinge management team, Mike Duignan and Alan Fisher established DF Precision Machinery Ltd in 2020. The partners' founding objectives were to use their wealth of experience, related to precision grinding machine sales and applications, to benefit the UK grinding fraternity, also to provide the highest standards of customer care. Key industries now being served are the aerospace, F1, mould, tools & die, bearings and medical sectors, also precision subcontractors.



In addition to offering a range of highly efficient, cost effective grinding solutions and related support services to all potential UK customers, DF Precision Machinery is the official global supplier of Jones & Shipman spare parts and support services. The company holds the extensive J&S OEM records, drawings, and software and offers unrivalled expertise related to Jones & Shipman products.

Over several years, Hardinge has acquired many iconic, world renowned precision grinding brands, including, Kellenberger, Voumard, Hauser, Tschudin, USACH and Jones & Shipman. As exclusive representative in the UK and Ireland for all Hardinge grinding products, DF Precision Machinery boasts an impressive portfolio of solutions. Further complementing these products, the company is also the exclusive distributor of Okamoto grinding products in the UK. In addition to Okamoto's extensive range of surface and profile grinders the renowned manufacturer also offers internal, cylindrical, vertical, and rotary grinding products.

Explaining DF Precision Machinery's ethos, Mike Duignan says: "To ensure the delivery of highly efficient, reliable, precise grinding machines and solutions which provide an attractive ROI for our customers, we must use quality partners. The companies we represent are global leaders in their fields and have built strong reputations through their dedication and commitment to offering first-class products and support.

"We are committed to backing up our impressive product portfolio with first-class levels of service. In addition to providing expert advice related to all aspects of grinding, we are able to help potential customers to specify machines that enable their purchases to match their specific needs and budgets".

"Our Customer First philosophy ensures that all of our customers receive high-quality specialist support from initial sales discussions, through to the provision of long-term preventative and support services that optimise customers' return on investments."

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Advanced grinding and finishing solutions for the medical industry

Advanced Grinding Solutions (AGS) has always been closely involved in providing the very best manufacturing solutions to the medical industry. Initially starting by selling grinding and polishing solutions for the production of artificial knee and hip joints in the 1990s, it has gone onto becoming involved in answering industries needs for machines to produce a much larger variety of medical parts. As the medical manufacturing sector has changed, with new processes such as additive manufacturing being adapted, AGS has sought out new methods of grinding and finishing these parts.

Rollomatic, whose 5- and 6-axis grinding machines are widely used throughout the UK and Eire for the manufacture of more cutting tools than any other multi axis grinding machine, also offers machines for the production grinding of medical components of various kinds. Applications include the manufacture of medical drills, routers, burrs, saw blades, screws, reamers and surgical tools such as cranial perforators, anchors, Trocar points, guide wires, tweezers, forceps, scalpels, and rasps.

The main advantage of these Rollomatic machines is the kinematic arrangement of the sixth grinding axis that is particular needed when looking to grind medical saw blades. The 6th axis enables the grinding wheels to be inclined and this makes it

considerably easier to grind past the center line on a given part without damaging an adjacent tooth or feature. Even more importantly, the contact point of the wheel to the component remains constant over the entire grinding path instead of it altering as the wheel travels around it which is the case on 5-axis grinding machines. The use of the 6th grinding axis also ensures that more freedom to use optimum grinding paths is made possible due to the angular inclination of the wheel and this allows medical parts with very complex forms to be ground.

The surface finish of medical parts is also often critical and is improved by the use of linear motors on the grinding machines. The sealed for life/no maintenance aspects of the linear drives ensure that less or indeed no maintenance is needed and these factors help Rollomatic to offer their industry leading unlimited hours three years parts and labour warranty that is free of charge on all new Rollomatic grinding machines. The Rollomatic machines can be viewed on Rollomatic's virtual exhibition event at www.digitalrollworld.com.

Gerber polishing and deburring machines, also represented by AGS, are used by companies such as the medical implant manufacturer Medartis AG for deburring various titanium parts. Medartis was in need of a production method for rounding edges and deburring parts and the

Gerber BP-MX brush polishing machine was shown to fulfill that need and create precisely-defined radii or contours on edges with high accuracy. The purchase of the BP-MX machine for the double-sided controlled de-burring of titanium blanks eliminated the previous laborious manual de-burring process. Medartis saw several benefits from the investment they made in the Gerber machines and apart from the labour saving the parts are now better defined, have a regular improved quality, and the process is both easy and automated. Due to its high toughness, parts made from titanium place high demands on machines when machining the parts and defining the process is important. The Gerber machine enables Medartis to produce a perfectly deburred bone plate.

In 2019, AGS came across the GPA Innova D-Lyte polishing machines at an exhibition and after receiving demonstrations and, meeting with the Innova team at their works in Barcelona, was appointed as a distributor for the UK and Eire. AGS subsequently took delivery of its own D-Lyte polishing machine for demonstration purposes last year.

This machine is unique and uses the world's first dry electro polishing process that was developed and patented by GPA Innova. The D-Lyte range of machines use the patented, single step automated process, for polishing metals by ion transport using free solid bodies. This is a revolutionary dry non-abrasive electro polishing process that does not use any liquid as the electrolyte. These new patented machines polish and deburr medical parts made from nitinol, stainless steel, cobalt chrome, and titanium etc. Typical applications include stents, bone screws, artificial hip and knee joints, cranial and other implants, and any similar medical component whereby fine surfaces finishes to under 0.09 µm Ra are required without altering the key part geometry after the previous grinding or milling process.

Unlike traditional polishing processes, the D-Lyte solution obtains a consistent finish avoiding generating any polishing marks on the surface, such as those generated by conventional machining, and is able to process complex geometries without



generating any micro scratches on the surface which is the case with robot based belt polishing or machines using barrels filled with hard media.

Chris Boraston, managing director at AGS, comments that after seeing the DLyte machine he immediately recognised just how unique and special it was and the many advantages that it brings for the polishing of a wide variety of medical parts; many of which are ground on the grinding machines already sold by AGS.

The medical industry was amongst the first to benefit from using the D-Lyte machines for polishing implants. The typical process to finish implants was previously based on using mechanical abrasive based processes like robotised belt polishing cells or vibratory bowl type polishing machines. These type of process's work by generating friction onto the workpieces surface from a generic abrasive belt or hard media.

Although there are other procedures that involve dry polishing, this type of polishing primarily refers to circular bowl type vibrators. These may be used to round part edges and to polish the surface of implants. Those processes tend to present issues as they can be error-prone and it's hard to certify a specific success-scale as they don't offer a true consistency of results. These processes are not usually as reliable as the DLyte process and often require additional manual rework to achieve the desired finishing results.

D-Lyte machines achieve a superior surface finish than abrasive polishing type machines and the process can be more than five times quicker than mechanical abrasive machines and for the Medical Industry, DLyte has proven the Biocompatibility of the medical products processed using the DLyte System.



The 3D additive manufacturing of implants and other medical components is becoming the norm and not only are the DLyte machines also suitable for polishing metal additive manufactured implants they provide superior results than existing surface finishing technologies. This is crucial as one of the main issues that additive manufacturing has is being able to achieve a good surface finish after the parts have been produced.

An independent surface finishing study carried out by the Fraunhofer Institute for Additive Manufacturing Technologies looked at the various machines and processes used for the surface finishing of titanium and stainless steel additive manufactured parts. It considered, amongst other criteria, the surface finishes obtained, erosion rates and effects, and the edge rounding of inner and outer edges. Various

finishing processes were benchmarked against each other including abrasive blasting where a stream of abrasive material such as sand is propelled onto the surface under a high pressure, vibratory bowl finishing, chemical and electro polishing, and shot peening. The DLyte process achieved not only the best surface finishes but it was at least twice as good as the next best alternative process.

Anyone interested in any of the advanced solutions offered by AGS can view videos and download additional information from the AGS website.

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Boost productivity and profits with Freedom software

Autocam Medical partners with Freedom software to get the most out of its industrial assets and maximise profitability

Autocam Medical, a global contract manufacturer of high-precision CNC-machined surgical and medical components and devices, has ramped up its IIoT footprint using Freedom's Smart Manufacturing Platform. With the goal of improving productivity while increasing capacity, the Freedom Smart Manufacturing Platform allowed for just that and then some:

"We were able to quickly identify not only the gaps from plan, but what caused them so we could tackle the root cause and increase productivity," says Jeff Goodman, VP Business Development, Autocam Medical. "After the initial pilot, we assigned internal value stream champions to learn the value of the Freedom software and then increased the number of assets within each value stream connected to the platform."

"We are excited to see how our organisation has taken ownership of the real-time, detailed information and analytics produced by the Freedom platform. The things we love about Freedom are the easy to use mobile operator app, customisable dashboards displayed on large monitors in the shop, and its seamless scalability."

Conceived and developed by manufacturing experts, the Freedom Smart Manufacturing Platform allows connection to any industrial asset to provide automated



intelligence related to asset availability, utilisation, and continuous improvement. Autocam Medical's search for finding the perfect partner came to an end when finding this platform. "We were searching for a partner, not just a product" says Jeff Goodman "From day one, we had input on what was being put in place. It was so much more than a transaction; it was truly a partnership."

Autocam Medical plans to expand the Freedom footprint in 2021 and continue to develop new processes with an expectation to increase productivity and profitability.

Freedom's software development team has over 200 years of collective experience in controls integration, automation, material handling, and discrete manufacturing in the IIoT manufacturing industry. Freedom IOT is comprised of manufacturing people from the machine tool industry with intrinsic knowledge of machinery and industrial automation processing; from milling,

turning, grinding, bending, forming, punching, welding, additive manufacturing to robotics, general automation and motion control.

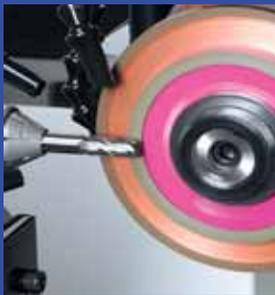
The company is focused on world-class manufacturing performance with lean manufacturing and Six Sigma experience, which allows it to support companies with continuous improvement initiatives. This in-depth knowledge of the manufacturing process has allowed creation of an innovative manufacturing platform that goes beyond reporting of Overall Equipment Effectiveness (OEE) and other Key Performance Indicators (KPI's) to provide actionable results to run more efficient, more profitable operations.

Autocam Medical is a global contract manufacturer of precision-machined drill bits, drivers, screws, plates, cutting tools and other complex, highly engineered surgical implants, instruments and handpieces, as well as other device components. Clients are involved with instruments and devices used in procedures including the foot and ankle, hand and wrist, hip and knee, shoulder and elbow, spine, as well as ophthalmology and craniomaxillo-facial procedures. The company offers a value-added approach to high-precision manufacturing with specialties in CNC milling, turning and cutter grinding. The company has achieved ISO 13485:2016 certification. It also has facilities in the USA, China and Brazil.



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Samputensili Machine Tools and Samputensili CLC become EMAG SU

The acquisition of Samputensili Machine Tools and Samputensili CLC by the EMAG Group, including the 87 employees across two sites near Bologna and Reggio Emilia, Italy, took place on February 3, 2021. The two companies will be legally integrated into the newly founded EMAG technology company, EMAG SU Srl. Over time, the plan is for the two plants of Samputensili Machine Tools and Samputensili CLC to physically merge, with a shared location near Bologna, Italy. The new company is aiming to reach 35 million euros in sales by 2025.

EMAG has decades of experience in an extremely diverse range of technologies and applications. The machine builder from southern Germany controls the entire process chain from soft to hard machining, a key factor in its ability to successfully manufacture individual production solutions and complete production systems. With the acquisition of Samputensili Machine Tools and Samputensili CLC, EMAG is systematically expanding its scope of technology by adding a range of gear production processes: shaving, gear shaping, tooth flank grinding as well as profile grinding and generating grinding. These methods perfectly supplement EMAG's existing portfolio, which already includes hobbing, chamfering and deburring. The benefits of this addition are bigger than just the individual technologies, it shapes EMAG's entire mechanical



engineering process by making new, holistic production solutions possible. These include everything from the first turning and gear cutting operations on a blank, to the grinding of diverse shoulders, and even the final tooth flank grinding step, the latter with Samputensili technology.

By acquiring Samputensili Machine Tools and Samputensili CLC, EMAG is not only expanding its technologies, but also its customer base. This is because the technology of the Italian machine manufacturers is also used in the production of pumps and compressors, as well as components for wind turbines, aerospace applications, shipbuilding, industrial transmissions and agricultural machinery.

"The powertrain electrification in automotive engineering increases the quality requirements for gears in terms of mechanical load, accuracy and noise emission. The hard fine machining of gears plays a decisive role here," explains Achim Feinauer, CTO of the EMAG Group. "We are also striving to highlight our extensive process expertise in the non-automotive industries. The networking opportunities for our sales department within Samputensili's customer industries provides us with a really great opportunity to do that."

Win-win for both companies

Samputensili Machine Tools technology is in high demand all over the world, in industries ranging from aerospace, automotive, shipbuilding and more. These industries profit from the expertise and experience that the Italian machine manufacturer has in gear machining. Within these industries, high-precision grinding, shaping and shaving machines are used, and few companies can match the wide variety offered by Samputensili. With this background, and wide ranging level of experience, Samputensili has an excellence chance of continuing its success within the market. This is even more true because each of these industries is undergoing technological transformations, while still striving to stay competitive on a global level. These changes require very specialised mechanical engineering, with many users requiring increasingly powerful production



solutions that reduce costs per unit, while also meeting growing demands on component quality, within the micrometre range. In this area, Samputensili will profit from the global reach of the EMAG Group. The South German machine manufacturer handles the global distribution of machines, laying the foundation for a successful future, by supplementing and expanding existing sales and service structures within Samputensili.

When it comes to application areas for certain EMAG technologies, customer consulting is vital. "Most markets and industries are very tight-knit, while having a presence close by to provide advice and support for individual questions or concerns is critical. With EMAG's global sales and service organisation, we are guaranteeing that. We have set a goal for ourselves to open up new application areas for EMAG SU, and are focused on continued growth," says Markus Heßbrüggen, CEO of EMAG GmbH & Co. KG. Additionally, the companies are combining their production network: in the future, various subassemblies and parts for Samputensili machines will be manufactured at EMAG's production site in Zerbst, one of the most sophisticated tool factories in Europe. The final assembly of machines will remain in Northern Italy. With this system, many Samputensili solutions will be completed faster and more efficiently. For over 50 years, Samputensili has been developing and producing a wide range of machine tools at the company's headquarters in Bentivoglio close to Bologna, Italy, recently under the umbrella of the independent company, Samputensili Machine Tools. The focus has been on rough and fine machining of gears, shafts, worms, rotors and other screw-type workpieces used in machine manufacturing, aerospace technology, the automotive industry and robotics. With its outstanding innovative solutions, for example for generating grinding, shaving and shaping, Samputensili offers its customers a competitive edge and a quick return on investment. High-tech features, such as linear drives, energy-saving concepts, parallel processes and integrated measuring and dressing units are evidence of the high standard of the company. Samputensili continuously invests in research and development, with a focus on efficiency and minimising the effect of the machine on the environment.

In 2019, Samputensili Machine Tools acquired the Italian company CLC, a



traditional manufacturer of hobbing and shaping machines. Since then, the new company has been producing gear hobbing and shaping machines in Cadelbosco di Sopra in the area of Reggio Emilia. Samputensili CLC supplements the portfolio of Samputensili Machine Tools with gearing-related products.

Samputensili Machine Tools offers an extensive range of innovative machine tools that cover the entire gearing process. These include chamfering and deburring machines for manufacturing spur and helical gears. Since the chamfering, rolling and deburring is performed in a single process, extremely short cycle times can be achieved.

Self-centring tools guarantee symmetrical chamfers on both sides of the workpiece.

Samputensili profile grinding machines with their powerful main spindles are used for the machining of internal and external gears, crown gears, worms, rotors and other screw-type workpieces. The production of both small and large batch sizes are possible. The technology stands out for its precision, short tooling times and reliability. Integrating dressing units safeguard the process reliability. To accommodate various grinding wheel sizes and types, a variety of spindles with the corresponding power and performance is available. It is easy to connect the machines to various automation technologies and to integrate internal measuring systems.

The generating grinding machines are customised solutions for the rough-machining and finishing of gears. Offering short chip-to-chip times, intelligent axis concepts, thermal and mechanical stability, as well as easy user navigation, these machines provide great performance boosts in the grinding of large workpieces and geometries. With the SG 160 SKYGRIND, Samputensili also offers the first dry grinding machine in the world. This is made

possible by an intelligent combination of skiving and generating grinding.

Samputensili shaving machines can perform all shaving processes, depending on the model and the axis configuration, from plunge and transverse shaving to underpass and diagonal shaving. This makes it possible to produce shafts and toothed gears in a variety of sizes for use in automotive, motorcycle, industrial and pump transmissions. The high rigidity of the machines guarantee high precision. Powerful tool and workpiece axes safeguards efficient processes with varying batch sizes.

The company's tool reshaping machines are used for grinding the profiles of hobs and form cutter disks, for sharpening shaving cutters and for grinding master gears. Depending on the task, a variety of grinding methods ensure that the cycle times are minimised and tools are perfectly ground. Quick-change solutions simplify machine operation.

Under the Samputensili CLC brand, horizontal gear hobbing machines for shafts and long workpieces are produced, as well as vertical shaping machines. The solutions are powerful, have a modular design and can be flexibly configured for a wide range of customer requirements.

The EMAG Group is one of the few makers of manufacturing systems who can cover the entire process chain from soft machining to hard machining. Access to an extremely wide range of technologies (turning, drilling, milling, hobbing, grinding, laser welding, induction hardening, ECM deburring, PECM, automation) allows EMAG to create complete process chains for the production of transmission, engine, and chassis components, as well as diverse solutions for the non-automotive industry.

Based in Salach, near Göppingen in Germany, the corporation has a rich history and uses the comprehensive experience of all the companies in the EMAG Group to supply its customers with cutting-edge modular turnkey manufacturing solutions. Whether standalone machines or complete manufacturing systems, for a part supplier or OEM, EMAG offers the right applications for an extremely wide range of workpieces.

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Nearly 80 years of precision engineering excellence

Coborn has a unique, global position supplying specialised, individually built, high-precision equipment to the polycrystalline diamond industry, single crystal diamond and gemstone industries. The experience gained from producing machines for almost 80 years, puts Coborn in an excellent position to advise and assist its customers with the subtleties of PCD, PcBN and SCD tooling where machine setup and preparation are critical in the production of complex tool geometries.

The company offers a wide range of machines and accessories for all facets of the diamond industry, including the latest-generation PG6 and RG9A grinding machines with full CNC control, which are used extensively in the production of diamond cutting tools. Optional extras are available for Coborn's machines providing a tailor-made solution for the specific requirements of each customer.

Coborn's expertise in spindle design and dynamic balancing is still of utmost importance in scaife benches for polishing high-value gem diamonds and this still remains one of the company's core strengths. However, meeting the specific customer needs of the constantly evolving industrial diamond market has become the greatest factor in the continuing success of the company.

Coborn works closely with its international network of partners, agents and distributors to provide the best engineered solutions for the global diamond industry. Customer care is paramount to Coborn's company ethos and through its global collaboration and partnerships, the company strives to provide its customers with unbeatable quality, reliability and economy. It forms long-term relationships with its customers, which contribute greatly to the ability to offer bespoke engineered solutions, product development and performance enhancement. The company offers an extensive range of customer support services worldwide, including online diagnostics and training programmes.

The Coborn machines are designed to be future-proofed, so that the option to upgrade existing equipment to the latest technology is ongoing and at the forefront

of its development. Coborn designs its own software completely in-house thus enabling a very fast response to specific customer requirements.

Introducing the PG6

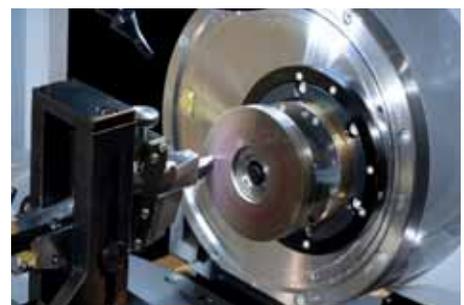
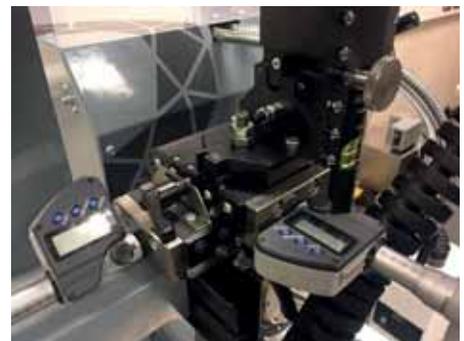
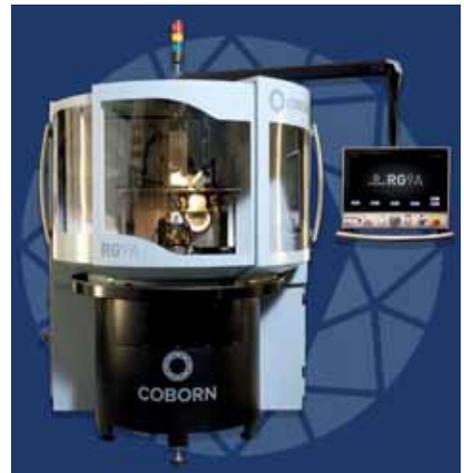
The latest-generation planetary grinding machine, the PG6, is an automatic, ultra-high precision grinding machine that is designed specifically for processing natural or synthetic single crystal diamond (SCD) tools. A world-first engineering solution for the precision manufacture of controlled waviness and complex geometry tools using high quality air bearings for both wheel spindle and the pivot. Programming is extremely simple and minimal training is required.

The PG6 features a new closed loop nano-stop for more accurate finishing of the radius form and a high resolution camera is used in conjunction with an improved optical lens system to enable geometry validation. The updated system provides a quick exchange for optional lenses. The enhanced vision system positioning stages are equipped with 1 um resolution micrometre heads for ease-of-use and more accurate positioning.

The output power of the lap spindle is increased by more than double compared to the PG4, to enable higher grinding loads and the PG6 is equipped with an LED light source with dual fibre optic goose-neck delivery allowing more precise positioning of the lighting. The optional extraction unit with dual suction points facilitates the removal of any diamond particles to create a cleaner working environment.

The floating table position is monitored using a five nanometre resolution scale. This measurement is plotted against the pivot angle enabling the operator to identify any points of excessive push-off. The PG6 also features acoustic tracing. A touch probe is supplied to enable audio monitoring of the grinding process. The machine enhances this well-established technology to plot a graph of amplitude against pivot position giving a visual representation of any variations.

Coborn offers a number of software options for the PG6, which include: Curve



Block – to enable the processing of elliptical, hyperbolic, parabolic and cubic forms; Profile Block - to generate a concave form with multiple blended radii; Contour Block - to generate a concave form with a single radius; Helical Block - to generate SCD end mills with primary and secondary cutting clearances; K-Land Block - to perform a negative cutting edge around the flanks and radius of a tool.

The company is very much looking forward to showcasing the PG6, along with new applications for the PCD product ranges, at upcoming exhibitions in the not so distant future.

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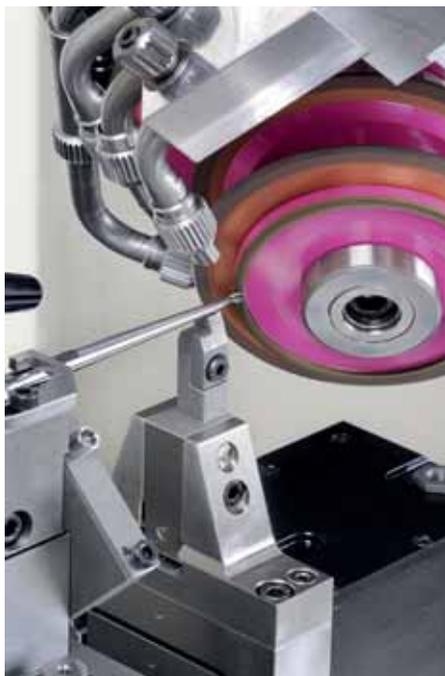
AGS goes from strength to strength

2020 proved to be a near record year for machine sales for Coventry-based Advanced Grinding Solutions (AGS) despite the many obstacles that all of industry has faced.

In early 2020 as travel was curtailed, AGS put into place use of all the major video conferencing platforms and liaised with its various principals to ensure that as close a contact as possible could be kept with its customer base. In carrying over lots of projects from 2019 and bearing in mind that at the time its average machine tool delivery time was well in excess of six months, it was always the case that 2020 was going to be busy. New projects have been handled and further sales made due to the success of machine manufacturers such as Rollomatic who brought out their Rollomatic Digital World (digitalrollworld.com) to allow customers to enter into a virtual world event, showcasing all of its machines and applications, and to then have the ability to join with a Rollomatic specialist for a one to one live discussion regarding the equipment they are interested in. Launched last November this event was intended to only be used occasionally as a replacement for some of the cancelled machine shows but due to the high uptake Rollomatic has decided to keep it fully open online.

Rollomatic continued to lead the way in 2020 with numerous deliveries being made on machines ordered in the final quarter of 2019 and with additional sales added throughout 2020 which culminated in an order from a new customer in October for four machines worth in excess of £1.5m to a large subcontractor based in Eire involved in the manufacture of medical components. A further two Rollomatic grinding machines were also sold in late 2020 for the manufacture of press pin tooling and are currently under build. All Rollomatic grinding machines come with their industry leading three years unlimited hours parts and labour warranty.

AGS received a block order for the four machines, comprising of three multi-axis Rollomatic CNC grinding machines and a Tschudin Cube CNC centreless grinding machine. This was enabled with trials being conducted at Rollomatic in Switzerland and with remote presentations of those results back to the customer in Ireland. The three Rollomatic machines were just recently



Rollomatic 6-axis tool grinder

installed and the Tschudin machine is currently undergoing its final grinding trials in Switzerland. The machines are equipped with Comat filtration systems, also represented by AGS, to guarantee the highest levels of filtration with minimal running costs.

Chris Boraston, MD at AGS comments that the sale of the Tschudin machine was especially pleasing because this is a new generation of centreless grinding machine that first received its world-wide debut at the last EMO exhibition and the sale marked the first one AGS has supplied. The Tschudin Cube machine benefits from a highly radical

design that sets it apart from all other centreless grinding machines as was acknowledged by it winning the prestigious Red Dot Design Award 2020. The Red Dot jury commented that, thanks to an innovative layout, the Cube machine is both ergonomic and efficient at the same time. With more than 6,500 submissions from more than 60 nations in 2020, the Red Dot Award is one of the biggest design competitions in the world.

The high precision, 3-axis Tschudin CNC grinder forms a perfect symbiosis with the integrated robot, allowing for small batch production to be automated and enabling further increases in the machines productivity. The automation solutions enable users to achieve significant productivity gains and the machines particularly quick and flexible changeover times help to minimise machine downtime. What sets the Cube machine apart in particular is its very small size and radical open design for easy access. Users only need access to the rear of the machine to perform maintenance and servicing tasks, which means that several machines can be positioned together without any gaps. The philosophy when developing the machine was to have minimal area and maximum efficiency.

The grinder can be manually loaded in a very safe and ergonomic way outside of the grinding zone both by right-handed and left-handed users, a feature for which a patent has been applied for. The machine has a unique design with digitalised setup and grinding processes to ensure the highest possible process stability and



A trio of Tschudin Cubes

machine availability. Linear direct drives on the X, U and W axes ensure flexibility and productivity with the Cube being specifically developed for the grinding of small components with part diameters of up to 20 mm.

The Cube's simple and low-maintenance machine design helps to reduce operating costs. The natural granite machine base and upper structure guarantee the best thermally stable, high precision and safe grinding processes. One major benefit of the machine is that it allows for the easy and safe CE-compliant loading and unloading outside of the grinding zone. Tschudin's "easy" software, which the company developed in-house, makes the machine easy to operate and automate. The patented, movable workpiece support ensures process options such as the rough and finish grinding in one cycle and the grinding of sharp edges with precise radii. Areas of application include plunge-cut grinding, grinding of several parts in a single cycle, oscillation of the component during grinding and throughfeed grinding. This versatility means that the Cube is suitable for a wide range of applications.

Rollomatic, whose machines produce more cutting tools in the UK and in Eire than any other, has continued to expand and bring out new machine models such as its new NP50 cylindrical grinder with the first UK end user, Samwell Tools in Poole, taking delivery of theirs in early 2020.

The medical tools industry, with its large base in Ireland, continues to invest in Rollomatic GrindSmart 6-axis grinding machines that give unparalleled levels of efficiency and productivity with uptime reaching rates of 99 percent. These machines, that are equipped with linear motors, provide quality benefits such as

enhanced surface finishes and with the linear motors themselves being cooled by the same oil used as the coolant oil ensures consistent thermal stability. The medium sized 630 machine range allows tools from 0.1 mm to 20 mm in diameters to be manufactured and as standard include high-speed automatic tool loaders that can accommodate in excess of 1,300 tools. A patented shank guide with steady rest support allows parts to have a concentricity of under 0.002 mm and the 6-axis design gives unparalleled levels of flexibility while allowing, for example, the perfect grinding of spheres.

The Comat filtration systems provide the best obtainable degrees of filtration and indeed samples taken a few weeks into production of the Rollomatic machines in Ireland have recently been analysed and the laboratory results found to be easily within the NAS 7 band which is better than most virgin unused oil. Today, more than 20,000 machines use Comat Filtration Systems, with more than 120 million litres of metalworking oil being super-filtered every single day. Comat operates globally and has a 30-year history in developing the most advanced filtration systems that are available. Comat's Superfiltration Technology uses continuously regenerating filtering media to ensure that particles larger than $\leq 2-3 \mu\text{m}$ are removed from cutting fluids and the fluid is maintained at a stable desired fixed temperature. Oil that is filtered by Comat systems does not need to be replaced and many clients report that they have never changed the oil for up to 20 years (save top-ups).



Comat C180 Evo filter unit

Chris Boraston concludes: "Despite the obvious obstacles in having to do more grinding trials and machine acceptances remotely and with customer visits curtailed, as well as despite the obvious issues in installing machines remaining, our principals have more than met the challenges that they have faced. The uptake of the digital platforms, some of which have been around for years, has been fully embraced and allow for ever more efficient meetings that for us often includes engineers from three of four different countries all being able to link up together on-line without difficulty.

"With Rollomatic having UK-based service support, this of course has further helped, as has the use of 24/7 remote monitoring technology used on the Comat filtration systems and on most of the machines. Indeed Rollomatic's Smart Connectivity platform that covers the concept of autonomous grinding, machine connectivity, unattended production and communication exchange systems has been in operation for quite a time now, as has the Rollomatic RMonitor machine monitoring software that gives users a real-time production cockpit to improve productivity, provide scheduling flexibility and to display manufacturing history. Industry was already changing and adopting and embracing new technologies at a pace we had not seen before and the current pandemic has simply increased this pace of change still further."

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Part of the Tschudin team with the award winning Cube grinder

Okamoto the 'go to' surface grinder for Go Tools

Motivated by his vision of establishing a highly efficient tooling manufacturing business with the highest precision and quality standards, Andrew Millard set up Go Tools Ltd in 2012. By adhering to the business' founding principles, the Rotherham, South Yorkshire-based company soon established an impressive customer base.

In addition to producing diecast tooling for use in zinc, aluminium and magnesium foundries, Go Tools manufactures mould tools for the medical, automotive, packaging, electronics and consumer goods industries. To keep pace with ever increasing demand, over the past decade the company has increased its skilled workforce, regularly invested in advanced CNC machine tools and further expanded its range of in-house proficiencies.

Go Tools' progressive investment policy involves purchasing highly-efficient machine tools that deliver high standards of precision. In addition to helping the business to maintain its hard-won reputation for the quality of its output, the rapid cycle times achieved by the company's cutting-edge production aids allows cost-effective quotes to be tendered and new business to be won.

Go Tools' machine tool investment strategy can be illustrated by the recent



installation of two innovative Okamoto ACC450AV precision surface and profile grinding machines, purchased from DF Precision Machinery Ltd, Okamoto's UK distributor. Explaining the reasons behind installation of the Okamoto grinders and their successful use, Go Tools technical director Steven Barrowcliff says: "Having enjoyed excellent service from two older Jones and Shipman machines, we decided

that, because of their increasing maintenance costs and the growing pressure on our grinding department, we would search for two advanced new surface and profile grinders. The chosen grinders needed to satisfy our high-precision requirements and also be able to further increase our grinding efficiencies.

"Having considered several alternative machines, we concluded that the Okamoto ACC450AV precision surface and profile grinder best met our long list of demanding criteria. To help prove the ACC450AV's capabilities, I witnessed an impressive demonstration of the ACC450AV performing a wide range of demanding grinding tasks. The grinder confirmed its suitability for our needs, and we were happy to place an order for two machines.

"After their installation and operator training, our new Okamoto machines soon began to make a significant contribution to our surface and profile grinding work. In addition to our ACC450AV's high-precision and the outstanding surface finish capabilities, their ease of use and impressive speed and efficiency has resulted in the machines becoming extremely popular with our grinding staff.

"High-standards of surface and profile grinding are critical to the quality of the tools that we manufacture, and these qualities are exactly what our Okamoto machines deliver. We have been so



impressed with our new Okamoto grinders that, to help satisfy ever growing demand for our tools, we are now planning to soon install two additional ACC450AV precision surface and profile grinding machines."

The advanced Okamoto ACC450AV precision surface and profile grinding machines, as purchased by Go Tools, provide a generous grinding length of 450 mm, across travel of 170 mm and a maximum grinding height, between the machine's table and a new 205 mm diameter grinding wheel, of 357.5 mm. The foundation of the ACC450AV's outstanding precision capabilities is the machine's robust Meehanite casting. In addition to providing exceptional levels of both static and dynamic stiffness, the use of Meehanite delivers excellent damping qualities.



Mike Duignan of DF Precision Machinery Ltd adds: "As Go Tools reflected on the merits of several other alternative surface and profile grinding machines, we were happy that the company decided to purchase two Okamoto ACC450AV machines. So successful have the ACC450AVs been, we are delighted that we will soon be delivering an additional two machines to Go Tools. As exclusive distributor of Okamoto in the UK, we are proud to represent such an excellent and reliable range of profile and surface grinders."

DF Precision Machinery Ltd Tel: 0116 201 3000
Email: mike@dfpmach.com www.dfmach.com

To help avoid the negative effects of heat expansion and vibration, and as an additional support to accurate grinding, the machine's hydraulic unit is isolated from its main structure. A combination of scraped V-V slide ways, the use of low friction Turcite material and the provision of an automatic, gravity-fed lubrication system ensures accurate grinding across the machine's life and results in minimum maintenance needs.

The ACC450AV's long list of standard equipment includes a micro cross-feeder that allows fast and simple change over from 0.02 mm to 0.001 mm graduations, while a high-visibility cross-feed digital readout enables all manual adjustments to be easily monitored.

The ACC450AV's variable speed wheel provides simple variable speed control of the grinding wheel, enabling it to match each workpieces' material and surface finish requirements. In addition, optimal speeds can be achievable when using CBN grinding wheels. An overhead manual dresser provides a simple yet effective straight line dressing option for vitrified grinding wheels.

A wide selection of coolant and filter systems are available to suit individual users' needs. In addition, the grinding machine can be supplied with a choice of magnetic chucks, including electro-permanent models that prevent heat build-up during the grinding process.

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From batch to mass production - Your partner in precision

TECNO.team UK has been established to be a frontrunner in supplying the most advanced grinding technology to the UK's engineering and manufacturing industries. Together with a strong relationship with Curtis Machine Tools, it is able to provide a range of high precision grinding machines from Japan and Europe's elite.

TECNO.team UK can offer customers engineered solutions along a broad spectrum of high precision grinding applications, from a single machine to a complete production line. The focus centres on productivity gains through process and accuracy optimisation. The engineering team, with support from its Japanese and European principals, provides the highest level of technical support.

From the showroom and application centre based in Colchester, Essex, the UK engineering team can provide the design and development of solutions that are precisely tailored to maximise your production output. It has installations within the aerospace, automotive, bearing, cutting tool, defence, hydraulic, tool and die industries, meaning it is equipped with in-depth knowledge and experience.

In addition, it can also offer Q-Grind cylindrical and surface grinding machines, which are similar to the Supreme and Techmaster, previously offered by Jones & Shipman.

TECNO.team UK is the exclusive UK agent providing sales and service for the following selection of world-leading grinding machine manufacturers:



Q-Grind U1000

The Q-Grind Universal performs complex and varied grinding tasks precisely and reliably. The machine has been designed to produce both small and medium size workpieces and is available with a distance between centres of 600 or 1,000 mm and a maximum swing diameter of 450 mm in individual, small batch or high-volume production.

The machine is based on the standard 'T' configuration with a base being formed by a high quality Meehanite casting, designed in such a way to ensure high stiffness and damping properties are inherent in the machine.

The Q-Grind offers you a precise and inexpensive CNC universal grinding machine with an excellent price/performance ratio. This machine includes user-friendly conversational software, using the latest FANUC control and touchscreen.



TECNO.team UK are also ideally structured to offer the following services for Jones & Shipman and other European grinding machine manufacturers:

- Service and preventative maintenance contracts
- Breakdown assistance for mechanical, electrical and software faults
- Spare parts
- Operator training
- Customised software reduces setup time, operator error and extended functionality
- Machine upgrades and refurbishment
- CNC retrofits and control upgrades to extend product lifecycle

These services are offered by ex-Jones & Shipman Engineers, supported by the partnership with Curtis Machine Tools, one of the few remaining grinding machine manufacturers in the UK, offering over 45 years' experience in high precision grinding.

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A long tradition in grinding

Curtis Machine Tools is a well-established British manufacturer of high-precision grinding machines for small components. It supplies bespoke engineered grinding solutions to manufacturers worldwide and has over 45 years' experience within a variety of industries, such as automotive, cutting tools and defence.

The company's Grind in a Box patented technology has proved to be a global success and based on this innovative concept, CMT has designed and manufactured the VECTOR family of grinding machines. The engineering team at CMT is constantly developing new machining methods and applications that are precisely tailored to the needs of customers and market conditions, in order to maximise the efficiency of production. The integration of additional processes can be offered to provide a complete turn-key process, such as:

- Vision systems
- Automation
- Workpiece inspection
- Deburr, wash and dry
- Laser marking, packaging and much more

CMT offers limitless possibilities to engineer and implement the user-specific requirements. With hundreds of machines ranging from a standalone solution to fully automated production lines, CMT is one of the market leaders in this field and your partner when it comes to process orientated solutions.

The machines are fitted with the latest technology, including Siemens control systems and CMT engineers have a high level of understanding using both FANUC and Staubli robotics.

All the VECTOR machine variants share the same grinding platform, with a long radial stroke and a short axial stroke, for single and multi-plunge operations or peel grinding of profiles. VECTOR machines have been designed to give maximum productivity and precision with an exceedingly small footprint, providing an excellent ROI.

Twin – the VECTOR Twin incorporates an indexing twin-spindle workhead, allowing loading and secondary operations to be performed. This additional spindle allows loading and unloading to take place whilst grinding is in process on the other spindle, giving a spark-to-spark time approaching zero, making it ideal for cycle time optimised production.

Quad – the VECTOR Quad is based on the proven VECTOR Twin, revolutionising production grinding. The Quad uses an innovative four-spindle workhead, enabling the outer diameters or contours to be ground simultaneously on two workpieces, using the same grinding wheel, doubling the output.

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A first for PTG Holroyd and Siemens

New HG350-G gear grinding centre is first in the UK to use Siemens Sinumerik ONE CNC

A new precision gear grinding centre from PTG Holroyd hasn't simply been designed to bring greater levels of efficiency and accuracy to the production of specialised gears and tooth forms. The new HG350G machine is also the first from PTG Holroyd, and believed to be the first in the UK, to use Siemens' new Sinumerik ONE future-proof CNC, the successor to the automation specialist's 840D CNC.

PTG Holroyd has committed in excess of £1.6 million to develop its brand new gear grinding centre, a machine which has been designed to give the company a significant edge in the horizontal form grinding of high-quality gears.

"We plan to build two HG350-G machines to begin with," comments regional sales director, Mark Curran. "One will remain on site in Rochdale for R&D purposes. The other has been purchased by a long-standing PTG Holroyd customer."

Uncompromising objectives

In designing the HG350-G, PTG Holroyd's goal was to offer customers much more than a new generation machine for the one-off and batch grinding of high-accuracy precision spur and helical gears, as well as worms and screws of up to 350 mm in diameter.

"We wanted to create a machine with class-leading integrated safety and failsafe features, i.e. rich, real-time reporting of machine health and performance data, as well as the highest levels of industrial security," adds Mark Curran. "Other non-negotiables for the HG350-G included being exceptionally intuitive for operators, easily able to accommodate each customer's Industry 4.0 strategy and being future proofed against legacy software issues.

These were all attributes that the Sinumerik ONE CNC was able to offer. Additionally, the associated software suite's ability to create a digital 'working' twin of the machine on the desktop before build commenced was a considerable advantage.

"Typically, when creating a new machine tool, you begin with a vision, a concept of what you would like your new machine to achieve," says Mark Curran. "That said, software can't normally be written or



mechanical components ordered until the design is complete and has been verified – and, even then, changes may be required. By working in close collaboration with Siemens, however, we were also able to embrace the 'Create my virtual machine' and 'Run my virtual machine' software capabilities of the Sinumerik ONE suite, in order to create and run a 'digital twin' of the proposed HG350-G."

Used in tandem with its own internal



machine design packages, these capabilities enabled PTG Holroyd to build a virtual machine on the desktop, then grind virtual gears and threads, test safety and failsafe capabilities and eliminate potential problems before commencing the machine build.

"At PTG Holroyd, we pride ourselves on a 'right first time' approach," adds Mark Curran. "The virtual machine build and run capabilities offered in the Sinumerik ONE suite further helped us to fulfil this ethos, enabling us to input and observe entire manufacturing cycles before commencing a physical build. This will also make acceptance testing with future HG350-G customers simpler and straightforward. In short, they will be able to sign off on their gear grinder before it has even been built."

Future-proofed advantages

"It has been a privilege to work with the PTG Holroyd team to incorporate the capabilities of the new Sinumerik ONE CNC into the HG350-G gear grinder and to help utilise the benefits of the Sinumerik software suite to perfect the machine's design," comments Siemens' application engineer, Garry Mephram. "PTG Holroyd is an important customer of Siemens in the UK and I am confident their decision to use Sinumerik ONE will provide significant benefits, both in terms of machine design & development

and by providing customers with future-proof capabilities and control."

About the HG350-G gear grinding centre

Replacing PTG Holroyd's well-established GTG2 model, the HG350-G features the high power required for deep grinding operations. A specially developed extended machine bed allows screws and worm shafts of up to one metre in length to be accommodated. Dedicated software compensates for helical twist, and full topological capability comes as standard.

Embracing the Sinumerik ONE CNC's Profinet capabilities, IO-Link communication technology will be offered with all new HG350-G machines.

"We selected IO-Link for its significant data-handling capabilities and its ability to communicate at every level of the production process, with rich levels of data such as pressure, temperature and detailed machine diagnostics," says Mark Curran.

"RFID scanning is a further option that will assist HG350-G users in achieving new levels of performance. Particularly suitable for machines destined for production cells, the feature will all but eliminate human error by helping ensure that chuck, collet, cutter and tailstock, in fact virtually any component or tooling item that needs to be switched between manufacturing cycles, is correctly changed for each gear grinding operation."

Simplifying the most complex processes

Maintaining the Holroyd tradition of building machines that simplify even highly complex manufacturing processes, the HG350-G combines extreme rigidity with high power for both CBN and



conventional deep grinding operations. On-board features include: automatic coordinate adjustment, in-cycle wheel dressing, integrated profile management and coordinate measurement. Grinding cycles are included for spur gears, helical gears, crowned helical and spur gears with root or tip relief, worm gears of the form ZK, ZI, ZN and ZA, dual lead (duplex) worm gears; splines. The HG350-G also features PTG Holroyd's Profile Management System (HPMS) for highly accurate profile grinding, while an advanced touch-screen interface allows the operator to enter design drawing information directly into the machine.

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Efficient filtering with the Virus Cleaner VC 60 air purifier

As a globally active machine manufacturer based in Nordrach, Germany, with numerous sites across the globe, the health of employees, customers and partners is the JUNKER Group's top priority. An additional protection measure against COVID-19 and to ensure well-being has been developed together with the subsidiary LTA Lufttechnik GmbH.

The Virus Cleaner VC 60 air purifier supports the established infection prevention measures, such as face masks and social distancing rules, by actively filtering indoor air. The air purifier considerably reduces the viral load when used in places where a high density of people cannot be avoided and distancing regulations cannot be enforced, such as manufacturing plants, conference rooms, canteens, workshops and offices. The Virus Cleaner VC 60 air purifier provides an additional preventative measure in all of these situations. The technology behind the Virus Cleaner VC 60 air purifier is based on LTA's forty years of expertise in air filtration.

These devices are used in Nordrach, as

well as in all JUNKER subsidiaries around the world, in order to protect everyone's health. LTA Lufttechnik GmbH has significantly increased production so as to offer other companies the opportunity to

protect their employees in a yet more comprehensive way. Numerous customers and partners of the JUNKER Group are already using the devices, meaning, for example, filtration systems have been delivered to Germany, France, Italy and Spain.

CEO of the JUNKER Group, Isabelle Mansoux says: "We have developed the Virus Cleaner VC 60 in order to protect our employees and partners from dangerous infections. We owe our knowledge and expertise to our staff and partners, which is why it is self-evident to us that we should use every opportunity available for providing additional protection.

"The more people that experience additional protection and the easier it is to do so, the faster coexistence and



cooperation becomes normalised, the risk of infection sinks and people feel more comfortable again in situations that a few months ago caused a great deal of unease."

LTA Lufttechnik GmbH

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Master Abrasives appointed key supplier for 3M precision products

A long-standing partner of 3M, Master Abrasives has been appointed as a key UK supplier for 3M precision abrasives.

3M, the science-based technology company, has appointed Master Abrasives as main Authorised Distributor. This will make Master Abrasives the prime supplier for hi-tech products with the latest technology from both the 3M and Master® brands.

3M conventional and super abrasives products will be offered, from grinding wheels with revolutionary precision shaped grain (PSG) to diamond finishing films. These PSG wheels are known in industry for their unique ceramic aluminium oxide grain proven to increase efficiency and productivity where precision matters most, like in the gear, powertrain and turbine industries.

Ian Meredith, applications engineering manager at Master Abrasives, comments: "We're known for providing solutions to customer applications. For example, to provide grinding wheels that cut cooler,

faster and longer, we have developed precision products such as our Master SAWPRO™ grinding wheels for circular saw manufacture and resharpener. 3M is also known for developing innovative products that improve productivity, like its durable PSG bonded products. So, our reinforced partnership with 3M is an excellent result for both companies and will help our offering go from strength to strength."

As a key 3M bonded supplier, Master Abrasives is set up to offer high levels of customer service to support the range. Looking after day-to-day queries will be Customer Service team leader, Kelly Warrington, who has a lot of experience in precision bonded products. On the technical side, Ian Meredith will provide more in-depth product support, while the sales team will help customers in identifying optimum solutions from 3M's bonded abrasives.

The sales and marketing teams at Master Abrasives are also receiving additional training to fully support 3M bonded



customers in line with the company's goal to provide "solutions for industry."

Contact Master Abrasives' team for advice on application requirements and trials of 3M products or for product literature.

Master Abrasives

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New X-Treme R860 flap discs from Norton

The new X-Treme R860 flap disc offers a high-end zirconia solution designed to reduce process costs through more aggressive cutting, improved quality, longer life and higher material removal. Whether it is grinding down to bare metal, removing burrs and cutting edges, or preparing or removing welds, X-Treme has significant advantages over its equivalents.

Benefits include: aggressive cut and metal removal - aggressive zirconia grain provides an impressive initial cutting rate, especially with coarse grain sizes and more abrasive grains loaded into each wheel resulting in higher performance; longer disc life - lower disc wear means longer grinding time without loss of cut during the entire disc lifetime; fewer disc changes are required during the application process, which saves time and money for the end user and produces less waste due to reduced CO₂ emissions.

Heavy duty applications

Strong polyester cloth and a reinforced fibreglass backing make the disc ideal for

heavy duty grinding. X-Treme withstands high pressure, even on edges and removes up to two times more material.

X-Treme R860 Flap Disc has been tried and tested in internal and external case studies, delivering excellent results: longer disc life; high material removal; finer finish; faster processing; fewer changeovers; less labour time; more efficient x-treme flap disc.

Contact your local Norton representative to try out the new X-Treme R860.

Norton have cared a lot about abrasives for more than 130 years. It cares so that when you need the right sandpaper for your bathroom makeover or the right grinding wheel to streamline production in your plant, it delivers choices that matter to your workforce, the environment and your bottom line.

Norton is constantly looking for ways to improve your working conditions and simplify the job by eliminating dust or noise, reducing total costs by increasing the number of parts you can finish in an abrasive application, as well as considering the ergonomics of the application to improve



worker comfort. 'Right' means different things to every customer and if it doesn't have the solution you're looking for today, you can count on Norton to be developing that solution for tomorrow.

As a brand of Saint-Gobain, a world leader in the habitat and construction markets, Norton offers the widest portfolio of cutting, grinding, blending, finishing and polishing solutions for all markets, materials and applications with the most advanced and affordable technology.

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Tel: 01785 279553

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As cool as ICE for HSS tool manufacturers

HSS is currently undergoing an uplift. Constant innovation research and product development, along with changes in the way that tools are being used, has meant that HSS drills, cutters, fibre tools and specialist tools have found a new lease of life and are once again becoming very popular and hard steels are still justified for many different applications. When it comes to the universal use of tools for various materials, the production of frequently changing projects in small quantities means that the price of individual tools also increases.

As you may probably assume, the market for such tools has also changed a lot. Low-cost supplies from many countries are pushing into the supposed high volume/ high demand markets, which again is having an inevitable effect on the prices of such tools. The quality is also thought to fluctuate across steel and coatings, but the geometries and surfaces of these tools showcase the biggest differences in performance, particularly in the function, durability and work results. In order to use tools effectively within their respective environments, they need to be consistently of a high quality but again this introduces the battle between quality and price. However, high quality products come at a price.

With the capabilities of modern grinders advancing to reach very high cutting speeds, this makes it ever more important to maintain high quality in the production and manufacturing of this specialist equipment.

Development progress in bindings and grinding grain

Thanks to continuous development and implementation of successful product innovations in other areas of application, TYROLIT has now succeeded in developing a new generation of grinding discs specifically for the requirements of HSS tool manufacturers. Modern HSS tools don't just need good surfaces to make shavings slip well, they also need consistently accurate geometries on both cutting edges and stretch areas. This enables the safe transportation of chips and coolant in large volumes to avoid so-called late scavengers. The analogy is that the production of high-quality HSS tools becomes more cost-effective in the long run, as with other tools, even if the application increases

durability at the same time. However, this degree of development can't be said for grinding discs, as the ones being used to date are often limited in their application speeds. In addition, the continuous nature of use/ processes often leads to increased wear and tear and thus carries a higher risk of overheating and the dreaded grinding fire.

In the light of this, TYROLIT has a core focus going forwards: to innovate a product that avoided some of these consequences/ side effects and strive to increase possible working speeds two-fold.

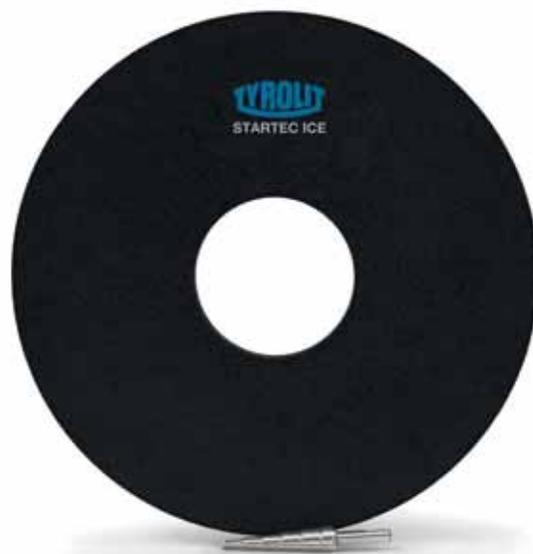
The new STARTEC-ICE grinding discs do not only offer new grain sizes and mixtures but also present a completely new way of integrating them into the grinding surface. This enables a very abrasive grinding disc surface as well as a consistent and uniform surface. This is to help achieve a good cut image on the workpiece. In addition to a sharp grain, effective grinding also requires a binding system that is tailored to the combination tool and material. The binding not only has the task of keeping the grinding grain in place for as long as possible throughout processing, despite the ever-increasing grinding forces, but also has the responsibility for the grain distances and the resulting chip space.

The launch of STARTEC ICE grinding discs is a true result of the futureproof, forward-thinking and innovative mindset TYROLIT prides itself on. The Development and Application Technology department has invested far beyond the famous plates and drawn new conclusions. Going forward, TYROLIT wants to become more than just a manufacturer but also become a support network for end-users and do this firstly, by offering less expensive HSS tools, raising their production to new levels of productivity and profitability.

Building on good experiences with the MIRA ICE grinding disc range launched a few years back, a grinding disc for rolling grinding offers the same principles for the

binding system of grinding discs, which are now transferred to new products. The result of this is a grinding disc that has very sharp cutting, grinding grains with long lifespan of individual cuts. The novel binding supports the grain and is thus partly responsible for low wear and tear cycles.

Thanks to the new manufacturing processes, there is an unusually uniform grain distribution in the grinding surface, which in turn allows many cutting processes to take near enough the same amount of time. In addition, the binding system ensures sufficiently large grain distances and a high porosity of the grinding surface. This



a high porosity of the grinding surface. This creates a space between the individual grinding grains. This free space enables efficient ways to transport the shavings and to keep coolant apparent within the process. This is so that the grinding surface does not clog when working with high speeds. The material shavings are safely removed without clamping or even being burned in. The high coolant volume provides cooling of the cutting and workpiece at the respective processing/workstation.

The result indicates a huge leap in the overall economy of grinding HSS tools as well, from a process safety perspective. Martin Pilz, marketing manager at TYROLIT adds: "The combination of innovative grinding grain and the novel binding system enables the highest sweep-outs and best surface qualities with significantly extended finish cycles at the same time. The reduced grinding forces benefit the workpiece and the machine." The power consumption of the grinding spindle is also noticeably decreased, making it generally more economical and environmentally friendly too.



All in all, the STARTEC ICE product line will give manufacturers of HSS tools, a means of production that significantly strengthens their positioning within a highly competitive market. The new performance values, in line with the modern machine park of the tool grinders, allow for a much more economical production of such tools, at a consistent level of high quality. For

customers, the feed has increased from an already good 2,100 mm/min up to 7,000 mm/sec. This reduces the cycle time from 7.2 seconds to just four seconds.

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Toolscope Modular Assistance System



With the help of the ToolScope assistance system, TYROLIT and its partner KOMET Brinkhaus offer a comprehensive Industry 4.0 solution in the field of grinding technology. The ToolScope Assistance System supports your production. It contains numerous apps that the users can easily access and utilise the acquired machine, operating and process data.

Find out more about ToolScope at www.tyrolit.com

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TYROLIT

Obtain the perfect finish on additively manufactured workpieces

According to DIN 8580, 3D printing is one of the primary forming manufacturing processes, in which a solid body with a geometrically defined shape is produced from a formless material. The process employs a wide range of materials such as metals, plastics and ceramics. Discovered over 30 years ago, additive manufacturing processes are now sufficiently mature as to be gaining a gradual foothold in industrial production. Whether for prototypes or series production, additive manufacturing is used across all industries for visible and functional components as well as customised design products. Jewellery parts, dental implants, earmoulds and engine blades are just a few examples. And the greater the possibilities of this generative process, the higher the workpiece specifications become. Series quality is the name of the game, which means that surface quality, repeatability and process reliability are under the post-processing spotlight.

Additively manufactured parts present a specific post-processing challenge

All 3D printing processes selectively apply the layers of a component, as it is composed of successive layers. This principle makes component forming both flexible and customised. 3D printed parts have a distinctive surface structure characterised by striations, pores, fissures and cavities.

The classic solutions for improving surface quality and reducing the stair- case effect.

The conventional solutions are manual post-processing, solvent vaporising or mass finishing, for example vibratory tumbling. The downside of the first option is that the human factor in manual smoothing and polishing is not cost-effective in terms of repeatability and process times.

Chemical smoothing processes require time-consuming and therefore costly work to prepare, replace and dispose of solvents. The acquisition costs are also higher than for other post- processing techniques, which essentially defeats the object of efficient volume production.

Vibratory finishing, on the other hand, involves no chemicals, but process times can be very long and hence often uneconomical.

OTEC disc finishing machines produce homogenous surfaces very quickly, without chemicals

OTEC disc finishing machines homogenise spongy, porous surfaces much faster by smoothing and polishing them. This comes down to the machines' mechanical operating principle: workpieces up to fist size (depending on machine configuration) are placed in the blue process container as bulk or piece goods along with grinding and polishing media suitable for the workpiece geometry. The container floor is a disc with a rotary bearing. When the disc turns at the bottom of the fixed container, the contents are set in motion in a toroidal flow. Centrifuging the workpieces and abrasive makes this a highly intensive and purely mechanical process.



OTEC's CF machine series

The OTEC CF Series is renowned for application flexibility, repeatability and process reliability.

In the central control of the system, process parameters defined individually with regard to the workpiece are stored, monitored and executed at the push of a button. This ensures constant process parameters at all times. The water/compound concentration can be adjusted via touch panel, thus ensuring process reliability.

Sophisticated, intelligent splitting technology: the container consists of a plate as the base, a cylinder with a ribbed structure, and a replaceable wear ring. This means that the entire container does not

have to be replaced in the event of wear, which minimises the cost of spare parts.

Thanks to the zero gap system developed by OTEC, no very thin, filigree parts or process materials can get caught in the gap during the process. In addition, there is no water residue in the working container at the end of the machining process, as the water can drain off completely. Due to the optimal tank shape, the machine achieves a very good circulation. The OTEC CF user benefits from shorter process times and smoother surfaces.

Compared with vibratory finishing, OTEC disc finishing machines have a much higher mechanical abrasion level. For manufacturers of 3D printed parts, that means shorter process times, by a factor of 5 to 10.

The CF machines reduce manual rework to the absolute minimum if not to zero. That largely depends on the application in question and on your finishing requirements. Generally speaking, repeatable, reliable mechanical processing with disc finishing cuts the cost of manual work by 80 percent. Only the final polish, for example with jewellery, needs to be done by hand.



Example of a 3D printed workpiece (SLS) made by SolidPro, before (above) and after (below) the CF process



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New Lapmaster DL range of machines

The new 2021 Lapmaster UK line of Dual-Lap machines are based upon a two-way and three-way planetary concept, designed to yield very precise and repeatable results at a more cost-effective price.

Excellent flatness and thickness results can be obtained when either lapping or polishing a wide range of materials including glass, ceramics, crystals and metals.

Only the inner and outer gears rotate on the DL175 and DL370, allowing for fine control of the carriers to orbit around the inner gear and rotate on the surface of the stationary plates. The larger DL500 uses a 3-way system, where the top plate, bottom plate and inner gear rotate.

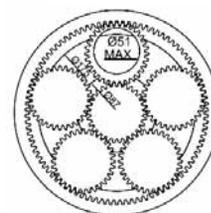
Designed using lightweight aluminium extrusion and polycarbonate guarding, the range consists of small bench top and larger floor standing units for use in low volume laboratories and medium industrial applications. Optional thickness control and stainless steel wetted parts for polishing are available.

Contact Shaun Weeks in the Design Team:

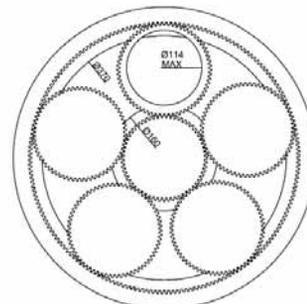
Tel: 01752 893191 Email: sales@lapmaster-wolters.co.uk for pricing or to answer any technical questions.



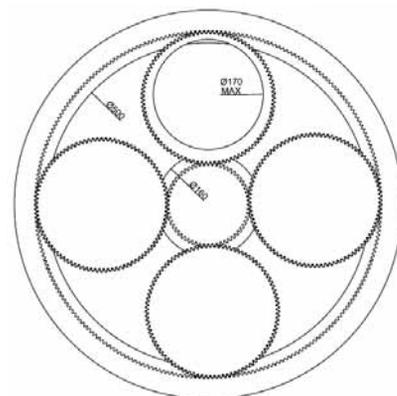
DL175



DL370



DL500



Machine	DL175	DL370	DL500
Plate Diameter (mm)	175	370	500
No# of Carriers	5	5	4
Thickness Range (mm)	0.1 - 20	0.2 - 30	0.5 - 40
Maximum Diameter (mm)	51	114	170
Thickness Tolerance (mm)	+/- 0.005	+/- 0.005	+/- 0.005
Parallelism Tolerance	+/- 0.001	+/- 0.001	+/- 0.001
Process Pressure Range (Kgf)	2 - 5	5 - 20	5 - 60
Upper / Lower Drive Power (W)	60	300	750
Upper / Lower Drive Speed (rpm)	1 - 125	2 - 64	5 - 50

DL 770 in development



MEPSA and Southern Engineering Equipment form partnership

MEPSA is a world leader in the manufacture of high-quality automatic machines and equipment for polishing, grinding, deburring and satin finishing of metal and other materials with and without system robot integration. MEPSA provides engineering solutions to its customer's requirements from conception design to machine manufacture. All manufacturing is undertaken within its facility in Artes which is located 70 km outside of Barcelona, Spain. The company has been manufacturing machine tools since 1984 and therefore has over 35 years' experience.

MEPSA launched the first numerical control machine for polishing onto the market in 1985, the first rotary transfer machine with eight stations and 40 CNC axes in 1988 and integrated robotic solutions since 1994. It has combined technology and adaptability to offer personalised equipment in response to specific customer requirements, assuring the best and most efficient performance, flexibility and usability.

All the working processes include a feasibility study and define the project goals and design. Machine manufacture, pre-delivery, training, setup, startup and after-sales service will all supported in the UK by Southern Engineering Equipment Ltd.

MEPSA has delivered many successful solutions to a variety of industrial applications such as taps (faucets), sanitary ware, stainless steel sinks, door handles,



automotive parts, cookware, stainless steel tubes, aluminium cast parts, medical elements such as prosthesis and a variety of luxury items. MEPSA has a large portfolio of delivered solutions which include CNC machines, robotic cells, CNC rotary tables, robotised lines, long parts lines and machines for metal sheets working.

As part of a global strategy to increase the exposure of MEPSA, a promising partnership has been formed with Southern Engineering Equipment Ltd and particularly with MD John Spiers, who has a wealth of knowledge within the grinding, polishing, finishing and robot integration. He is an ex-time served machine tool builder with over 42 years' experience within the industry and has worked all over the world. This is therefore a perfect fit.

This partnership creates a synergy between the experience of MEPSA and its

technical solutions and Southern Engineering Equipment Ltd with its in-depth knowledge of UK market and its own huge technical background in engineering.

Southern Engineering Equipment Ltd (S.E.E.) is a machine tool Supplier of new and used machine tools, service, parts and consumables, with all products supported by a team of trained engineers. It offers the complete package from the initial point of contact to the delivered, installed, and commissioned machine, including operator training. Located in Poole, Dorset on a 9-acre site, it is an ISO 9001-2015 company.

If you are thinking of an upcoming new project, S.E.E. offers free technical advice. With installations throughout the UK and Eire, its philosophy is to offer to customers the best solution for their particular application and within a realistic budget. S.E.E. prides itself in being able to offer its customers quality machines, supported by dedicated consumable experts and, with the advances in materials and new consumable grinding and finishing products new to the market, can not only offer cost saving but also can introduce new consumables that increase efficiency and throughput. S.E.E. is also a UK official distributor for 3M, VSM, Norton, Mirka and Klingspor Abrasives.

Southern Engineering Equipment has created a "one stop shop" for all your grinding and finishing needs. For further information, contact:

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www.mepsa.es



All round solutions from Kemet

Kemet introduced its first spherical lapping and polishing machine in 2004, primarily for the medical industry, where at the time the best hip replacement system available relied on balls and cups with a roundness and sphericity of <math><0.002\text{ mm}</math>. The big problem was not machining a spherical to these standards, the challenge was to produce a perfect blemish free mirror polish, whilst still maintaining these tight tolerances.

The result from this first application was the Kemet SPM, a twin station lapping and polishing machine that could either be used as a standalone system, or as a secondary supporting machine for an existing machining centre that, on its own, would not be able to generate the scratch free mirror polish that the industry demanded.

The SPM has capacity for a spherical from 20 mm \varnothing up to around 60 mm \varnothing and can be either a ball or cup. The 2-stage process takes around seven minutes per stage and produces a blemish free mirror polish using a combination of a special polishing pad and Kemet's ISO 9001: 2015 accredited diamond compound.

Following the success of the SPM, more spherical applications were received by Kemet. However, many of these were simply to replace manual hand matching of spherical forms and it became clear that the SPM was not a natural solution, particularly because most of these new aerospace applications did not need to be polished. To meet this new requirement Kemet developed the KemiSphere, a benchtop single station machine and now the KemiSphere II, a PLC-controlled benchtop machine with optional pressure system and fully programmable HMI.

These machines provide an extremely economical and repeatable way of processing spherical forms to a huge variety of surface finishes and can process a range of different materials either to be lapped as an individual component, or to match lap spherical forms together. It can be very difficult to document or validate a process that is currently being performed by hand so in these cases the KemiSphere II provides a perfect solution. The HMI allows component specific programs to be stored with drive



speeds, sweep angles, process times and pressures.

Kemet also offers to prove a process within its testing labs, producing test data and samples so that all questions can be answered prior to even ordering a machine. This also means that machines are typically delivered pre-programmed ready for use whatever the application.

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Buffing processes can have a detrimental effect on the roundness of balls and cups. Kemet's machines and processes produce a mirror polish whilst maintaining roundness specifications on ceramic and metal alloy sphericals. Our latest development, the KemiSphere II, a bench top spherical/ball lapper/polisher, laps and polishes spherical forms to better than five microns roundness with a mirror finish.

Renowned for reliability and quality, Kemet's facilities and expertise enable us to develop processes and equipment to lap, polish and clean most components and materials to a specific surface finish and geometry.

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Engis plate facing device is the key to ultra precision lapping and polishing

Superabrasive specialist, Engis Corporation has been engineering superior lapping systems, from machines and plates, to slurry and compound, for more than three decades, creating and tailoring solutions to meet the demands of lapping applications including the processing of metals, ceramics, glass, semiconductor substrates and electro-optical materials.

Maintaining plate flatness is critical to sustaining a stable lapping process. Traditionally this has been achieved through the use of diamond plated conditioning rings, but this requires a high level of operator experience and skill. To meet this challenge, Engis has engineered a solution that helps take the 'black art' out of lapping, the FastLap Facing Device.

When reconditioning is necessary, the Facing Device uses a diamond tool bit to remove the top layer of the plate, making it flat to within microns. A groove pattern is then machined in a second pass. When the device is not in use, it retracts out of the work zone.

The Facing Device, in combination with the pneumatic pressure heads of the Engis FastLap machine, establishes a process that consistently achieves accurate plate conditioning and controlled surface geometry and texture, together with fast stock removal. With predictable plate surface topography, groove pattern and controlled velocity and pressure, the entire lapping process becomes easier to manage and results become more repeatable. In addition, the unit is operator-friendly and eliminates the strain of lifting conditioning rings onto the plate.

FastLap machines with Facing Device are available either as simple facers with micro-grooving capability or as fully

programmable servo drive units for deep grooving after facing. Furthermore, the Facing Device control is integrated with the machine control and machines are available in eight plate sizes.

Using Engis' programmable facing/grooving unit, integrated with the FastLap control system, generates a consistent, controllable bearing ratio, resulting in a consistent lap rate. The alternative: using conditioning rings and abrasives, generates a random, uncontrolled texture, resulting in an unpredictable bearing ratio and a inconsistent lap rate.

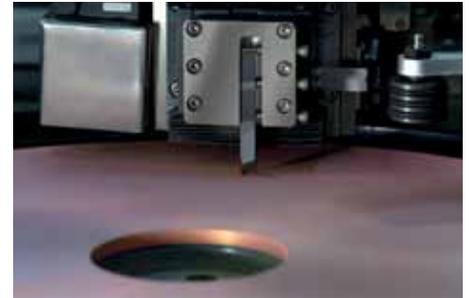
A video of the Plate Facing Device in action can be viewed at www.eng.iscom/plate-facing-and-grooving-technology.

Engis Lapping Plates

The plate, which is a key component of any lapping system, can often be overlooked as an important variable in the total process. The shape of the lapping plate influences the geometry of the parts being processed and contributes to achievable surface finish and lapping rates. Quite simply, plate flatness is key to part flatness.

Lapping plates provide support in applying abrasive to the surface of the work piece in fixed, semi-fixed or free lapping modes, therefore predictable, repeatable plate texture is critical to abrasive action. Controlling the groove pattern (macro texture) and lands (micro texture) of the plate surface allows for greater consistency in removal rates and surface finishes. A consistent bearing ratio means consistent unit load.

One of the best ways of maximising the efficiency of the lapping operation is the selection of the appropriate lapping plate as well as its ongoing care and maintenance.



For each application, Engis can offer a suitable lapping plate; for example for aggressive stock removal, composite iron plates provide excellent flatness, long service life and refined surface finishes, particularly on metals and ceramics.

For moderate stock removal, one option is the use of composite tin plates which offer a lead-free working environment and provide superior surface finish, while working with coarser diamond slurries for fast stock removal, long service life and low reconditioning requirements. An alternative could be Engis' widely used Hyprez HY Copper plate, suitable for lapping virtually any solid material and which minimises fracturing and chipping tendencies when lapping crystal components.

For applications requiring very low stock removal, a tin-antimony plate may provide the best answer, being resistant to temperature variations during lapping and also preventing changes in lubricant viscosity during continuous lapping.

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FLP offers it all

Fine grinding machines, lapping machines and consumables

FLP Microfinishing is the only company in Germany to offer the entire range of industrial fine grinding, lapping and polishing machines for flat surface finishing from a single source. The four FLP product lines are new single and double-sided machines (both standard and full CNC), fully rebuilt and refurbished machines, the supply of lapping consumables and tooling, as well as a large sub-contract lapping facility. FLP was started in 1996 by Thomas Rehfeldt and employs over 60 people at its main HQ near Berlin and boasts a worldwide network of dealers, including Advanced Grinding Solutions Ltd in the UK.



The broad range of FLP fine grinding and lapping machines includes both twin wheel double sided CNC lapping machines, as well as single wheel machines. Around 25 percent of FLPs sales are for fine grinding machines that offer 2-3 times the stock removal of more traditional lapping machines. 75 percent of sales are for lapping machines that are used where there is a low stock removal requirement with a mirror finish and perfect flatness. The fine grinding process, that uses diamond or CBN wheels, is much cleaner than lapping and virtually eliminates workpiece cleanliness issues. Furthermore, this process is many times faster than lapping and bridges the gap between traditional lapping and standard grinding technologies. Fine grinding creates a micro cross-hatched finish on parts that is akin to one after a superfinishing operation that has advantages in terms of surface retention of lubricant, while still offering very high degrees of flatness and a mirror like surface.

The FLP single wheel series of lapping machines comprises very small and cost-effective machines of 400 mm in diameter up to 3.5 m versions with dressing/control rings of 1.3 m in diameter. The FLP double disc or twin wheel machines offer a working disc diameter of between 540 and 1,300 mm. These are fitted with Siemens PLC controls, can all be offered with full automation via linear or robotic solutions, and weigh between up to 16 tonnes. These advanced machines are offered as high-precision versions with granite machine beds and the latest machine controls and measurement technology.

In the machine rebuild division, and regardless of the type and size of a customer's old fine grinding, or lapping machine, FLP will carry out process and technology orientated improvements and general overhauls. The many advantages of such a general machine overhaul are a large cost saving of up to 40 percent compared with the cost of a new machine and shorter delivery times.

FLP holds over £2.5million worth of lapping consumables in stock

and offers end users of all types of lapping machine the largest range of wear parts and consumables. The range is vast and includes for over 4,500 different items such as lapping and polishing oils, fine classified lapping powders, lapping and polishing fluids, honing oils, diamond sprays, suspensions, powders and pastes.

FLPs machines are in use across many branches of engineering including automotive, aerospace, bearings, optics and technical ceramics etc. Applications include the production of pumps, bearings, ceramic seals, fuel injection and transmission components.

Chris Boraston of Advanced Grinding Solutions concludes: "FLP really does offer the one stop global solution for anyone with a lapping or fine grinding requirement including new machines, used machines, refurbishment of the customer's own machines, tooling, consumables, spares, and a very large subcontract facility."

More information on FLP including videos and brochures is available for download on the AGS website:

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Can-do attitude leads to success for BTH Import Stal

Family ownership and a can-do attitude with ambition to invest year-on-year has seen Krakow, Poland-based BTH Import Stal grow into a fast-moving supplier of acid resistant and stainless steel sheet, coil and tube, but more importantly a supplier of added value components to a wide range of customers.

When asked what makes BTH Import Stal special, board member Tomasz Kotarba responded by saying: "Family. We are a family-owned business, and our 300 employees are an extension of that family and that makes what we have special. Unlike many of our competitors, who are simply part of larger shareholder driven corporations, we have the flexibility to respond to market trends. We are also free to invest and invest on an annual basis to ensure that our people and facilities are industry leading."

While at the outset BTH Import Stal was a stockholder of stainless steel, the business has developed and it has focused more on added value, supplying pre-processed material, semi-finished products and finished products, such as its Pillow Plate material, it has achieved by developing its capabilities with the introduction of laser cutting, bending, and coil processing. The company currently operates out of a 30,000 m² facility in Krakow, with ambitious plans to double that within the next three

years, while also increasing the 75,000 tonnes of acid resistant and stainless steel that it processes on an annual basis.

"Added value production is becoming a larger part of our business, the more we process, the happier we are. Of course, to achieve this we need to continue to invest. While we are investing in our capabilities, we continue to take forward steps. It would be nice to pause at some point as not investing means backward steps, so we will continue."

Investment based on experience

Over the past 15 years, BTH Import Stal has worked with Timesavers on a variety of projects and the two companies have developed an excellent working relationship. "From a commercial aspect doing business with Timesavers is a pleasure, The people are nice and they are open to do business," comments Tomasz Kotarba. "Technically, they are also excellent. We rarely have need to contact the service department, but if we do the response is fast and efficient. As part of our plans to double the size of the factory, we intend to invest in a second line and Timesavers will be our supplier of choice."

The relationship has seen a sheet-to-sheet processing line installed in 2007, now fondly known as the Grandma line due to its longevity and reliability, as well as stand-alone grinding and surface finishing

machines, such as the 42 Series deburring and grinding machine. The success of these machines and their familiarity in terms of technology made the decision straightforward when BTH Import Stal wanted to increase capacity and capability by introducing a coil-to-coil line.

"The Grandma line has been running successfully since 2007 thanks to the solid, yet simple design of the Timesavers machines. The long life of these machines and the fact that in some respects the Timesavers technology is timeless, made the decision an easy one and we probably wouldn't have considered another supplier," adds Tomasz Kotarba.

The new coil-to-coil line features two Timesavers 71 series machines, one equipped with twin wide abrasive belts for finishing and the second fitted with twin brushes for fine finishing operations. The decision was founded on improving efficiency and productivity. Both Timesavers 71 series machines can operate independently, depending on the surface finish specified by the customer, and subject to the thickness of the material a coil can contain up to 1.5 km of stainless steel, which can be processed without interruption or manual intervention. "Processing coil material is much more efficient than sheet-to-sheet both in terms of throughput and production costs," says Tomasz



Kotarba. "Consumable costs are reduced as we find the abrasive belts last much longer, and the productivity gains we can achieve will see costs reduced by 50 percent in some cases."

Both machines are operated under 'wet' conditions, with the abrasive belts and material subjected to coolant delivered at every stage. Therefore, a washing/drying unit is installed in the line prior to the material be recoiled. Using a wet process may seem out of step with modern environmental thinking, but Tomasz Kotarba disagrees: "Wet grinding has is often viewed as old technology and less friendly to the environment, but we see it as having distinct advantages in the manufacturing process. We can achieve better and more consistent finish on the material we are processing when grinding with coolant, this is a particular advantage when processing coil. It also reduces the number of abrasive belts that we use compared to dry grinding, which is a positive outcome in environmental terms."

Tried and tested technology

The Timesavers 71 Series are highly versatile machines able to be configured with either two abrasive belts or twin brushes. The machines can be adapted to work on sheet or coil material in three standard widths, 1,350 mm, 1,600 mm and 2,100 mm, with a material throughput rate variable between zero and 30 m/min. They are capable of producing a variety of surface finishes including Duplo, Microlon and Hairline in stainless steel materials.

Control of the 71 Series is via the easy-to-use Siemens man/machine control interface. Conveniently located at a good working height and position the operator can control every aspect of the process from this single interface, while maintaining a good line of sight to the material being fed into the machine. "The versatility and ease-of-use of these Timesaver machines ensures that we can meet the demands of our existing customers, who come from a diverse selection of industries, including existing customers ranging from major manufacturers through SME's and business to consumer clients across a range of sectors including architectural, medical, food processing and construction," continues Tomasz Kotarba.

"The investments we have made have created a flexibility that our competitors are unable to match and that is something that is appreciated by customers, who are confident that we can deliver on our promises. We are focused on providing customers with a first-class service and can do attitude, means a customer will never hear us say 'we can't do that' because we can and will constantly strive to meet their requirements.

Investment in systems and manufacturing capability, such as the Timesavers coil-to-coil line is evidence of BTH Import Stal's philosophy of being open with customers, with family members always accessible for discussions.

Tomasz Katarba concludes: "Our focus is on the customer not the



shareholder, we operate as a family business and I think this is what makes us special."

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Debunking concerns about the use of abrasive finishing tools in CNC applications

With new advances in abrasive technology, machining centre operators are able to complete surface finishing simultaneously with other machining operations, to speed cycle times, improve quality and save on off-line finishing time and costs. As a result, contract machine shops are increasingly turning to abrasive finishing tools that can be easily integrated into CNC machines carousels or toolholding systems.

However, in doing so, questions inevitably arise about the use of abrasive materials in expensive CNC machining centres. The concern is often a generalised impression that “abrasives”, like sandpaper, release large amounts of grit and debris that could clog coolant lines or damage exposed slides or bearings.

“These are very expensive, very accurate machines,” says Janos Garaczi, president of Delta Machine Company LLC, a machine shop specializing in complex, tight tolerance parts made of titanium, nickel alloys, stainless steel, aluminum, plastics and other exotic alloys. “I wouldn’t do anything to jeopardise the accuracy or lifespan of the equipment.”

Fortunately, a closer examination of abrasive tools demonstrates that these concerns are largely unfounded. Although “abrasives” are often all lumped into the

same category, a distinction must be made between abrasives used for aggressive material removal and abrasive finishing tools. Finishing tools release little to no abrasive grit during use and the amount generated is comparable to the metal chips, grinding dust and tool abrasion created during the machining process itself.

Even if minimal fine solids are produced, the filtration requirements for abrasive tools are not much different than for machining. Any particulate can be easily removed using inexpensive bag or cartridge filtration systems, according to Jeff Brooks of Filtra Systems, a company specialising in industrial filtration systems including for CNC coolant.

“A disposable media vacuum filter or pressure filter is the most cost-effective option for the end user for filtration that will achieve the high clarity levels required,” he explains. “For fine honing work, I would recommend a 20-micron bag or cartridge filter at minimum to catch any fine solids and adequately protect the tool, the sump pump and keep the coolant ports from clogging,” says Chris Erato, director of sales at Oberlin Filter, another leading manufacturer of separation filtration for CNC coolant systems.

For CNC operators interested in a fully automated pressure filtration systems, there are units that eliminate the need to remove bags or clean magnetic separators that maximise production uptime.

Case studies from the CNC shop floor

According to Tim Urano, quality manager at Wolfram Manufacturing, any additional cost for filtration related to the use of abrasive tools is so negligible that it is “not really a consideration, because filtration systems are already required to remove particulate from the coolant generated during the machining process itself.”

At his shop, that includes scale, grit and rust created by cutting through raw stock. Wolfram Manufacturing is also machining more 3D parts made of Inconel, which can release fine metal powder into the coolant that isn’t fully sintered. As for abrasive tools, he says Wolfram Manufacturing has, “never ever experienced any problems caused by abrasives in our cutting fluids.”

For the past eight years, the machine shop has incorporated the Flex-Hone in all CNC machines for cross-hole deburring and surface finishing. The Flex-Hone from Los Angeles-based Brush Research Manufacturing (BRM) is characterised by the small, abrasive globules that are permanently mounted to flexible filaments, the product is a flexible, low cost tool utilised for sophisticated surfacing, deburring and edge-blending.

Removal of burrs and sharp edges in cross-drilled holes and other difficult-to-access areas such as undercuts, grooves, slots, or internal holes is critical. Failure to remove burrs can cause blockages or create turbulence in the flow of fluids, lubricants and gases through critical passages.

“On a given part, we might deploy two to three different size Flex-Hones, depending on the number of cross port intersections and different hole sizes,” explains Tim Urano.

The Flex-Hones are added to the tool carousel and are used daily, usually several times an hour, on some of the shop’s highest volume parts.

“The volume of abrasives that could even possibly come off of the Flex-Hone is insignificant compared to the rest of the particulate that gets into the coolant,” continues Tim Urano.

At Delta Machine in Gardena, California, automated crosshole deburring is also integrated into the CNC machining process.

“When you use the Flex-Hone for deburring, all you are doing is removing the burr. It doesn’t create much dust,” adds Delta Machine’s Janos Garaczi. “So, for me, any grit or dust released is zero concern. It is not like we are grinding inside the machine with powder everywhere. This is not the same at all.”

Abrasive nylon filaments

For Eric Sun, founder of Orange Vise Company in Orange County, California, even cutting tools such as carbide drills and end mills can create debris that must be filtered from the coolant. “Some machine shops might say ‘I don’t use any abrasives in my process, therefore, my machine is completely free of all particulate matter,’



but that is not the case. Even cutting tools can wear down and the carbide can come loose and get into the coolant," he explains.

Although Orange Vise is a contract manufacturer, the company primarily machines vices and quick-change fixturing components used in CNC machines out of aluminum, steel and cast iron. The company utilises four DMG MORI SEIKI NHX4000 high speed horizontal machining centers and two vertical machining centres.

According to Eric Sun, many of the vices are made of cast iron with selectively hardened surfaces. To match the surface finish of the hardened surfaces, Orange Vise uses NamPower abrasive disc brushes from Brush Research.

Composed of flexible abrasive nylon filaments bonded to a fibre reinforced thermoplastic base, the NamPower abrasive disc brushes contain a unique combination of both ceramic and silicon carbide abrasive. The abrasive 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. Other common uses are edge blending, part cleaning, and rust removal.

To complete the surface finishing operation, abrasive nylon brushes are installed in the tool loading system of each CNC machine. Although abrasive grit is involved, Eric Sun says the NamPower brush is a "different type of abrasive" because it is essentially "self-sharpening." Due to its linear construction, sharp new grains constantly come in contact with the work surface and wear off exposing fresh cutting particles.



"We have used the NamPower abrasive nylon brushes daily for six years. During that time, we have had no issues with any sort of particulate or grit getting into any critical surfaces," adds Eric Sun. "In our experience, any small amount of grit created is a non-issue."

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A better approach to metal cleaning when working through a pandemic

by Venesia Hurtubise, technical chemist, MicroCare, LLC

The COVID-19 pandemic has certainly impacted the metalworking industry, particularly in the production of small complex metal components and how to effectively clean them to obtain a finish ready for post-processing. Some companies were forced to minimise or even suspend production completely. Others, although remaining open, had to change their manufacturing processes. Practically overnight, they had to accommodate and adapt to new safety and social-distancing rules imposed by their individual governmental agencies. They had to find ways to keep their facilities contaminant-free and their workers safe from the virus. All while maintaining overall productivity to meet their customers' needs while still striving to reach their own company goals.

Some good news

Some metal finishing companies were required to furlough to reduce the spread of the virus or to mitigate its financial impact. Others were more fortunate. Due to the nature and classification of their work they were considered 'essential'. Particularly, those producing metal components for medical and defence industries. They were allowed to remain open without interruption to produce the parts critical to those operations.

Fortunately, the world is managing to adapt to COVID-19 and more manufacturers have reopened for business and the aftermath could actually have a positive longer term impact on these companies. They are now looking at how to incorporate agile manufacturing processes so they are not caught unprepared in the future and can adapt quickly to change. One area that is having to be reconsidered is the dilemma of how to continue to produce metal components efficiently while keeping their workers and their customers safe.

Protecting staff

The metalworking industry relies on its skilled workforce to produce high-quality components in an efficient and profitable way but, with COVID-19 still present,



Vapour degreasers use non-water-based cleaning solvents for environmentally sustainable cleaning

managers are challenged on how to keep their workers safe and healthy in the workspace. Some manufacturers have manual assembly, finishing and cleaning lines where workers typically stand close together. Usually much closer than the two metre social distancing standard set by their individual government agencies.

To accommodate the rules, some shops are reconfiguring their production footprint. They are rearranging workstations and adding more distance between them. When this isn't possible due to space constraints, some install clear plastic barriers to separate workers. This worker separation may require adding extra metal cleaning supplies and fluids to prevent workers from sharing them. Some companies also post signs and floor markers reminding workers to maintain their social distancing.

Other companies address the density problem by scheduling employees on staggered shifts. Or they add extra shifts to prevent all employees being on the floor at the same time. This not only helps prevent the spread of the virus, but is good contingency planning. Especially if one shift is impacted by the virus and needs to shut

down. There is a separate virus-free shift of workers ready and able to continue on with production.

For additional caution, many metal manufacturers provide their employees with PPE, including masks, shields and gloves. Importantly, they show workers how to properly wear the PPE, including how to don and doff it correctly to avoid infection. Also, many promote good hand hygiene by requiring scheduled hand-washing breaks and providing hand sanitiser to all workers to help prevent the spread of the virus.

The team approach to workplace cleanliness

For most metal finishers, workplace cleanliness, if not already important, now jumps to the top of the priority list. Some companies are taking an 'all-hands-on-deck' approach to workplace sanitation. Every employee essentially becomes an extension of the custodial or maintenance team. They clean and disinfect their own workspace. Some companies have even gone so far as to implement mandatory 'stop-and-clean' breaks throughout the day. These cleaning sessions, typically done at the beginning

COMPONENT CLEANING

and end of each shift and before or after breaks, helps limit any virus cross contamination between workers.

Supplying workers with effective and easy-to-use cleaning supplies, like surface cleaning wipes, makes cleaning more convenient for them. According to health officials, the ideal surface cleaning wipe should contain 70 percent alcohol to kill the virus. The wipes should also be made of fabric, not paper, to stand up to rough industrial work surfaces and rugged scrubbing. Also, a container with a tight-sealing lid helps prevent the wipes from drying out.

Some companies find this teamwork approach to cleaning gives employees more peace of mind. It shows them their employer is serious about their safety and it allows workers more control over how clean and sanitised their workstations stay.

Rethinking the cleaning process

Some manufacturers now approach cleanliness in two different ways. Firstly, the parts must meet their customers' cleanliness standards. Parts must be cleaned ready for further surface preparation or to be packaged. Secondly, the parts must be virus-free before shipping them. Airborne viruses can remain on parts after any human handling. Assembled parts with a lot of handling have a higher risk of COVID-19 contamination than those produced with less human contact. For instance, those made using automated robotic finishing techniques may be less susceptible. Also, metal parts left sitting in storage due to production delays or rescheduled shipments may have airborne virus particles settle on them.

As a result, some manufactures take the added precaution of decontaminating their finished metal components. Usually, the quality and packaging department workers clean them before packing. They typically use presaturated, 70 percent alcohol wipes designed specifically for surface cleaning. Giving the parts a quick, final wipe removes any lingering contamination and helps reduce the chance of spreading the virus to customers.

Keep your distance with automated cleaning

For manufacturers, protecting workers and customers during the pandemic is paramount, but they also need ways to manage health and safety without negatively impacting project timelines or

throughput. Some fabricators are finding a solution through process automation. By automating the parts cleaning process, they are able to social distance workers, produce clean, virus-free parts and still meet their necessary production requirements.

Vapour degreasing is a relatively common automated process that thoroughly cleans and dries metal components before post-processing. A single operator runs the entire automated batch cleaning process. This includes load-in, cleaning, and rinsing, to drying and load-out of the clean parts.

Batch cleaning metal parts with a vapour degreaser provides safer social distancing for workers by eliminating the close-quarter manual cleaning done by groups of workers at crowded manual cleaning stations. It provides exceptional cleaning but with a low human touch. Because vapour degreasing helps create a more flexible, socially-distanced workspace, managers usually don't need to add extra shifts or create staggered work schedules and, since the process is automated, vapour degreasing is easy to teach and learn. Managers can cross-train multiple vapour degreaser operators. This gives the ability to run multiple shifts if needed. Or it affords a staffing contingency in case of emergencies.

Quicker cleaning benefits finishing processes

Vapour degreasing is a fast metal cleaning process. One operator running the total vapour degreaser cleaning process, produces a batch of consistently clean parts, from start to finish, in about 6-20 minutes. It speeds up production throughput and allows manufacturers to more easily meet



A single operator runs the entire automated batch cleaning process



Inspecting metal parts: vapour degreasing cleans and dries parts quickly and effectively

demanding customer deadlines. Plus, only a portion of the operator's time is necessary to oversee the cleaning cycle. This allows them to perform other tasks while the metal parts are cleaned, further improving production efficiencies.

The parts are cleaned to specified quality standards. Since the vapour degreaser uses non-water-based cleaning solvents, the process does not carry the bio-burden risk of moisture being left behind, an important objective for those making parts for medical use. The parts are ultra-clean, cool, dry and ready for post-processing, and with no extra drying step needed speeding production further.

In addition, the chemical nature of the cleaning fluids is hostile to viruses and bacteria and do not allow them to grow. Therefore, shops can opt to skip any disinfecting steps like cleaning with alcohol wipes prior to packaging and shipping the parts to customers.

Prepare for the future

As the metalworking industry rebounds from COVID-19, many workshops are prioritising worker safety and facility hygiene, but they are also looking more critically at their metal cleaning methods and considering more automated methods. Vapour degreasing is an option that allows them to clean parts efficiently and effectively while also protecting the health and safety of their workers and customers. By switching to more automated cleaning methods, manufacturers can set themselves up for cleaning success during the pandemic and beyond which offers precision cleaning solutions.

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Modified alcohol cleaning solution transforms parts cleaning into strategic advantage for 3B Fluid Power

Founded in 2002, 3B Fluid Power is an Italian precision mechanics company specialising in the hydraulics sector. As a trusted industry subcontractor for the manufacturing of precision mechanical parts, the company works with a variety of materials including aluminum, steel and cast iron. Its production plant boasts 11 horizontal and 2 vertical machining centres, along with three turning machines for precision work.

The products manufactured by 3B Fluid Power are crucial to providing functionality to the systems into which they are integrated. This is why aspects like attention to detail, cleanliness and precision are non-negotiable.

During the production process two main types of lubricants are used, one of which is particularly suited to processing aluminum. At the end of the production cycle, the workpieces produced are subjected to the delicate and crucial cleaning process for the complete removal of any impurities and oil remnants so they can be further processed or assembled along the downstream supply chain.

Inefficient parts cleaning process became a bottleneck in the production

For years, 3B Fluid Power had been relying on a water-based cleaning system for industrial parts cleaning. Although it had not received any negative customer feedback about the cleaning quality, it often had to contend with the inflexibility and inefficiency of the system which had a negative impact on its operational efficiency.

For example, 3B Fluid Power could not clean different metals at the same time due to concern about contaminations in the bath. It also had to dispose the bath every three months which represented an additional operating cost. Pressured by the rising quality standards expected by customers and ever more challenging production and cleaning requirements, 3B Fluid Power recognised the crucial need to enhance operational performance.

Modified alcohol DOWCLENETM* 1601 convinces with its versatility

Just when 3B Fluid Power was evaluating alternative cleaning technology in the



market, it came into contact with IFP, a leading manufacturer of modified alcohol cleaning machines in Italy. IFP subsequently invited the company to perform cleaning trials and comparative tests on its machines at its headquarters.

For optimised cleaning results, IFP specifically recommended the modified alcohol solvent DOWCLENETM* 1601 provided by SAFECHEM, a chemical service company and solvent risk management expert.

The high-performance, virgin-grade solvent has both non-polar and partially polar properties. It can therefore remove oils and greases just as effectively as certain polar contaminations like cooling emulsions or solids such as salt, particles and abrasives. The distillable solvent is also characterised by a low toxicity and a good biodegradability.

After multiple trials and considered evaluation, in the end, 3B Fluid Power decided to invest in an industrial ultrasonic cleaning machine from IFP, which would be running on DOWCLENETM* 1601. The fully automated machine promises cleaning excellence and speedy workflow.

Easy solvent monitoring with the MAXICHECKTM test kit

Of course, achieving cleaning excellence has as much to do with the capabilities of the cleaning machinery as the effectiveness of the solvent used. The strength of DOWCLENETM* 1601 lies not only in its proven outstanding solvency power, but also its ease of monitoring for ensuring process stability and reliability.

The solvent is delivered in the SAFE-TAINERTM System, an active risk management measure developed by SAFECHEM that can further ensure safe and sustainable transport, storage and handling of the solvent.



With the solvent control kit, MAXICHECK™ DCL 1-N, 3B Fluid Power can regularly measure the solvent quality of DOWCLENETM* 1601 to detect any harmful developments. Modified alcohol cleaning solution affords high flexibility, time savings and energy costs reduction.

The perfect interplay between IFP's machine innovation and the unique properties of DOWCLENETM* 1601 has not only helped 3B Fluid Power improve cleaning performance but has also brought forth significant advantages including efficiency gains, cost savings and optimised work process.

"We can now eliminate the significant water consumption we had previously. This means we can also save on costs related to managing water cleaning and topping up the cleaning machine," remarks Andrea Barani, general manager of 3B Fluid Power.

Thanks to the automatic material recognition system, the new cleaning equipment can clean up to 4 trays of different metal types in one cycle. The machine is also able to automatically spray protection oil on cleaned components, a task that was not supported by the

water-based system and had to be carried out manually.

Previously, 3B Fluid Power had to blow dry small components with tiny blind holes because water was often retained in the blind hole thread. This process is now made redundant thanks to the optimised drying function of the machine, which further leads to reduced energy consumption and extra cost savings.

"Now that we no longer have to blow dry the components, it's much quieter at the site. As there's no need for compressed air, this also allows us to save on energy costs with the compressors. We're definitely working in a cleaner, quieter and therefore healthier and more sustainable environment," added Andrea Barani.

"The results we have been able to achieve since running the IFP machine with DOWCLENETM* 1601 have been nothing but impressive. During the trial tests, it was already apparent that the cleaning quality with DOWCLENETM* 1601 was much better than our previous water cleaning system. Today, we have gained a great deal of flexibility in managing the parts to be processed, our operation is further



optimised and we have no more noise in the plant. We can wholeheartedly recommend this highly effective solution to companies who need to engage in metal parts cleaning like us.

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YOUR EXPERTS IN COMPONENT CLEANING

Reliable part deburring, cleaning and drying on a 15-second cycle

EcoCvelox provides an innovative combination of high-pressure waterjet deburring and low-pressure parts cleaning processes

As a cost-efficient answer to continually increasing demands on the absence of burrs and particulate cleanliness, Ecoclean has developed the EcoCvelox system. Its modular design allows a custom configuration and subsequent expansion, at any time, of equipment from a single source to provide a combined high-pressure deburring, cleaning and drying capability. Cycle times of only 15 seconds per pallet can thus be achieved. Further standard setting features of the EcoCvelox system include a CAD/CAM interface for rapid and easy offline programming of the high-pressure deburring function plus highly dynamic part handling technology.

Hydraulic and pneumatic system components, engine blocks, pump and valve housings, nozzles, transmission parts, steering and brake elements and other, mechatronic components are just some examples of parts subject to ever more stringent specifications regarding deburring and technical cleanliness. Formerly, meeting both requirements in an optimum manner called for the use of equipment from diverse manufacturers. Now, with its innovative EcoCvelox concept, Ecoclean GmbH has developed a modular solution that combines 5-axis high-pressure deburring with various part cleaning and drying processes in an efficient and space-saving manner. Moreover, in addition to flexibility, the new system sets standards in terms of the process-to-cycle-time ratio, equipment level, operating convenience, ease of maintenance, and plant availability.

Maximum flexibility makes for optimum adaptability to user needs

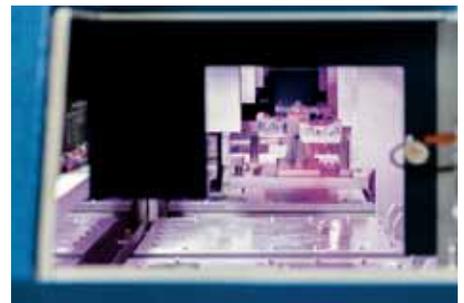
The modular design allows users to configure individual systems that merge high-pressure deburring, part cleaning and drying from a single source, and to expand them as needs evolve. A combination with other products from this machine manufacturer, e.g., solvent cleaning prior to deburring in applications involving high oil drag-in, is also possible. The diverse



The new EcoCvelox combines deburring, cleaning and drying processes with a highly dynamic and quick parts handling technology. This enables that these processes can be executed efficiently in one machine from a single source

standard modules of the EcoCvelox are rated for parts measuring 200 x 200 x 200 mm which are supplied on pallets. This format covers most general industry applications.

Tooling configuration for the various processes is likewise adaptable to the specific parts. Thus, high-pressure deburring can be performed using the standard single spindle at up to 1000 bar pressure (or a maximum of 3000 bar should the need arise). An optional HP turret accommodating up to five different tools supports complex deburring operations. It provides a tool-to-tool changeover time of only 1.5 seconds. The tools for the spindle and the HP turret can be custom-designed to match the given part and can be made by 3D printing. For part cleaning, the processes of injection flood washing, spray cleaning and selective rinsing are available and can be combined. Drying can be achieved by high-velocity air blow-off and/or vacuum, with the air blowing solution being integrable into a cleaning module as well.



High pressure deburring can be performed using the standard single spindle or an optional HP turret accommodating up to five different tools. Cycle times of only 15 seconds per pallet can be realised

CAD/CAM interface for easy programming of deburring operations

An absolute novelty in deburring systems, although a common feature on today's machine tools, is the CAD/CAM interface that can be integrated into the equipment. It allows a transfer of part design data for purposes of programming the high-pressure deburring step. This can be done offline to load the data into the machine controller,

which is easier and faster than any conventional teach-in method. Moreover, this capability helps to set up deburring processes for new parts in minimum time and at low cost. For part identification, a camera system can be integrated. The result is an effective and cost-efficient deburring operation, even with 'lot size one' parts.

14.5 seconds process time in a 15-second cycle

Part handling for the deburring process takes place in one Y-axis in the basic version. However, for high throughputs and the associated exacting cycle time requirements the module can be fitted with a second Y-axis. This allows loading and unloading to proceed in parallel with deburring. The process time, at 14.5 seconds, thus becomes almost equivalent to the 15-second cycle duration. The same can be achieved for the cleaning and drying module by integrating a second, concurrently operating work chamber.

Pallets are moved between the individual processing stations by means of a linear drive system integrated as standard that is characterized by its highly dynamic performance and wear-free motor. It conveys the parts from one station to the next at a speed of 4 to 5 metres per second, thus contributing further to the system's operating efficiency. The loading process can be automated by means of a gantry system or robot.

At least 50 percent increase in tool life

For process-inherent reasons, all tools used for deburring are subject to wear, which in turn results in a pressure drop. This means that tools need to be replaced after a certain number of operating hours. On the new EcoCvelox, a patented software and a VFD-controlled high-pressure pump ensure that the process pressure is readjusted for this effect. This smart solution, providing a continual adaptation of the high-pressure level, extends tool life by at least 50 percent and thus boosts plant availability at the same time.

For a fast and efficient tool change, the deburring module has a lateral maintenance door. This provides easy access to both the lance of the single spindle and to the turret-mounted high-pressure tools.

A smart solution for easy and effective operator control

Another feature contributing to the equipment's high process reliability and



The workpieces are also cleaned and dried as single parts. For these processes injection flood washing, spray cleaning and selective rinsing as well as high-velocity air blow-off and/or vacuum drying are available



On the 19" flat screen monitor (HMI), all of the system's modules are presented separately and clearly in a complete overview diagram, similar to a smartphone display

availability rates is its new intuitive operator guidance system. On the 19" flat screen monitor (HMI), all of the system's modules are presented separately and clearly in a complete overview diagram, similar to a smartphone display. If a problem occurs, this is indicated by a colour change of the affected module, e.g., to a shade of yellow or red. As the digital documentation is integrated into the HMI, it suffices to touch the image of the respective module briefly on the touch screen to view a process technology diagram, flow diagram or electrical circuit diagram in which all installed components are neatly shown, with the "malfunctioning" component, e.g. a pump, highlighted in a different colour. A detailed view of this item can in turn be pulled up at the touch of a finger. Various

functions such as activating or deactivating this component not merely support fast intuitive troubleshooting but also supply clear problem solving information. Moreover, the lists of wear parts and spare parts featuring in the digital documentation will facilitate part ordering if necessary.

Due to its high flexibility in terms of both equipment configuration and process design, the EcoCvelox is an efficient, one-stop solution for all deburring, cleaning and drying needs. To avoid exhaust air, the system can optionally be equipped with an energy efficient air recirculation system.

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Guide to oxygen cleaning standards for service components

The current pandemic has increased the demand for oxygen cleaning of services to treat patients with the COVID-19 symptoms. The first line of attack by the virus is the respiratory system so in many cases oxygen is administered as part of the treatment. The massive demand in the need for respirators and installation of new and extended oxygen systems in hospitals, clinics and care homes with the provision of ancillary pressure reduction and delivery systems has led to a massive increased demand for the valves, fittings and pipelines which control the supplies from storage tanks and cylinders all of which need critical cleaning.

ProSolv®5408e is a sustainable zero OPD and zero GWP solvent blend for high performance critical cleaning. This new solvent ticks all the boxes with the perfect profile for a vapour degreasing solvent.

ProSolv®5408e lower boiling point, economical with energy and low solvent losses, faster production, reduced costs, easy handling. Exceptionally low surface tension to penetrate micron sized holes and close contact surfaces.

High KB value for removal of organic residues, compatible with organic and synthetic oils and most plastics and metals, non-flammable, with zero ozone depletion (ODP) and global warming potential (GWP).

ProSolv®5408e is the perfect replacement for trichloroethylene, nPB (n-propyl bromide), perchloroethylene or flammable solvents used in general engineering cleaning processes.

Solvent of choice for critical cleaning

ProSolv®5408e has a unique range of characteristics make it the solvent of choice for critical cleaning applications such as oxygen components and service line cleaning, aircraft avionics and aerospace parts and servicing, precision optics, medical and high vacuum components and electronics.

ProSolv®5408e can be used in most solvent cleaning systems, one tank vapour degreasing or multi tank immersion / vapour tank systems using ultrasonics or flush cleaning for complex mechanical and electronic components with blind holes and channels and close mounted electronics or



for removing grinding and buffing soils on surfaces.

ProSolv®5408e is soft on the environment and safer for users. High performance, improved cleaning, lower costs. Sustainable and secure for future use as your forever solvent.

Component cleaning for oxygen service

Cleaning for oxygen service is best defined as the removal of combustible contaminants from the surface of any equipment or system in oxygen service. Essentially, any component that may encounter an oxygen rich environment.

The combustible contaminants include organic and inorganic substances such as hydrocarbon material for example oils and greases, paper, fibre, dust, and soils. If these contaminants are not removed properly, in a worst-case scenario, this can cause combustion or explosion in an oxygen atmosphere or at the least rejection of the product due to unacceptable product purity.

Oxygen is not flammable, but it supports combustion. Oxygen can react with most materials. The higher the oxygen content and/or pressure in a system the more vigorous the combustion and the lower the ignition temperature required. Materials that do not normally ignite in air will burn and may explode in an oxygen rich

environment. In addition, the oxygen rich environment will give rise to a higher flame temperatures and combustion velocity with potentially devastating consequences.

The recognition of oxygen's reactivity has led to stringent requirements regarding the cleanliness of equipment in oxygen service. Strict guidelines exist to ensure that care must be taken in the selection of equipment including all materials and components, which all need to be oxygen compatible. They must also be free from combustible contaminants as described above.

Special consideration must be given to any cleaning processes employed in the manufacture and maintenance of all components of oxygen service systems. There are many options depending on the type of contaminants from aqueous to semi aqueous and blasting systems to remove welding slag etc. These are all referenced in the publications in the addendum below and we refer particularly in this article to the European Industrial Gases Assn (EIGA) DOC 32 4.3.1.2 Solvent Cleaning.

Solvent cleaning offers huge benefits in cleaning processes. ProSolv®5408e the new sustainable solvent is especially relevant for this use. Energy saving, totally recyclable, environment friendly zero ODP and GWP are safe for operators. High output, very fast process times, non-flammable, it is an excellent solvent for all the oils, greases and

other organics which need to be removed after manufacturing processes and it is compatible with all types of metals and equipment, from immersion cleaning in simple multi tank counter current processes to integrated vapour and vapour liquid tanks with and without ultrasonics.

EnviroTech Europe has extensive partnerships with equipment manufacturers through its worldwide distributors, offering information and advice on solvents and solvent systems and which need to be considered.

Specific consideration must be given to the following: cleaning standard to be achieved (how clean is clean?); cleaning procedure; solvent cleaner to be used; surface properties of the parts to be cleaned; shape and geometry of the material; types and amounts of contaminants; the degree of automation required.

The size and capacity of the equipment is determined by the size of the material or components to be cleaned and the required throughput.

Your starting point should be the cleaning standard and procedure. Solvent cleaning

and solvent vapour phase cleaning of components consists of the removal of contaminants by immersion in the solvent, possibly with the addition of ultrasonic agitation and the action of continued condensation of solvent vapour on the component surfaces. The procedure requires that the oxygen equipment, system or component is colder than the solvent boiling point. This allows the vapour to condense on the components and perform a final rinse.

The major significant advantage of solvent cleaning is that vaporised solvent is always pure, and the contaminants remain in the boiling liquid section which requires only periodic cleaning out, thus causing a reduction in the frequency of system downtime.

The effectiveness of a particular cleaning agent depends upon the method by which it is used, the nature and type of the contaminants and the characteristics of the article being cleaned, such as size, shape, and material. Final evaluation of the cleaning agent should include testing of actual products and production processes.

All equipment must, together with the

cleaning chemistry, comply as a minimum with current legislation for health, safety and environment.

Efficiency is controlled by utilising typical samples, written procedures and requested criteria for cleanliness along with industry standards for cleaning of equipment and components.

As part of the programme of worldwide harmonisation of industry standards, the European Industrial Gases Association, (EIGA) has published EIGA Doc 33-18, Cleaning of Equipment for Oxygen Service. The publication was developed from the Compressed Gas Association Document G-4.1 Cleaning Equipment for Oxygen Service and the EIGA Document, Doc 33 Cleaning of Equipment for Oxygen Service. For information see EIGA's website.

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Effective CO₂ snow-jet cleaning process for small quantities of high purity parts

Whether in medical engineering, the semiconductor industry, in laboratory and development environments or in other areas, parts produced in small quantities often have to meet the highest cleanliness requirements. For such cases, acp systems has developed two new CO₂ snow-jet booths suitable for cleanroom use. These enable high-purity workpieces to be cleaned in a manual or semi-automated process with the quattroClean technology.

Components for high-purity applications, for example in medical engineering, laser technology, semiconductor supply industry, precision optics and metrology could hardly be more varied and yet they share common features such as low production volumes, high workpiece diversity and, above all, extremely high demands on surface cleanliness. This involves the removal of particulate and filmic contamination and, depending on the industry, possibly biological and ionic contaminants as well as organic and inorganic residues.

Research and development departments



The compact, cleanroom-suitable JetStation-HP is designed for cleaning tasks involving small quantities of parts that have to meet the highest cleanliness standards. With the manual cleaning booth, parts are loaded and unloaded via a front flap with hand access



With this standalone system made entirely from stainless steel, the part to be cleaned is placed in a receiver mounted on an X/Y-axis, rotary table, or combination of both, located in the process chamber

are also confronted with these requirements. Conventional parts cleaning solutions are usually designed for much larger quantities and in some cases, such as with wet-chemical cleaning, may reach its limits as far as process capability is concerned.

Compact CO₂ snow-jet booths suitable for cleanroom use

With the new manual and automated JetStation-HP booths, acp systems AG supplies compact cleaning solutions for these use cases with quattroClean technology. The closed, sound-proofed stand-alone units are made entirely of stainless steel. They are only equipped with components and materials used in cleanroom applications. When designing the process chamber, attention was paid to ensuring that detached contaminants and carbon dioxide are removed quickly and effectively by the integrated extraction system and that no dirt pockets can form. This prevents the cleaned parts from becoming recontaminated.

For both booth models, a system for monitoring the CO₂ concentration in the working area comes as standard. If the set limit value is exceeded, the carbon dioxide

supply is automatically switched off and an error message is displayed.

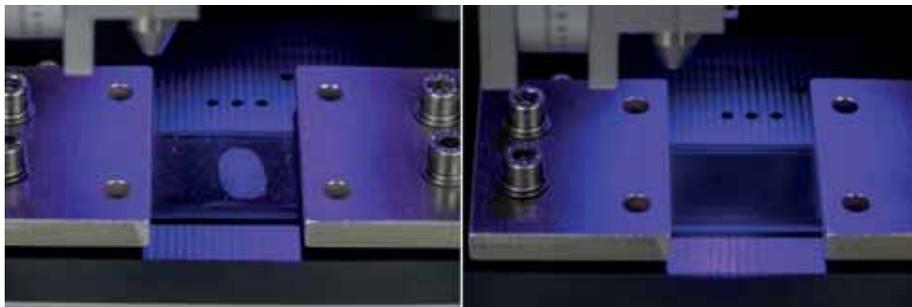
The manual JetStation-HP is loaded and unloaded via the front flap with hand access and is suitable for both seated and standing workstations. The cleaning process, in which the part is guided to the nozzle by the operator, can be started conveniently via a foot pedal.

If higher requirements in terms of process reliability and/or part geometry must be met, the automated JetStation-HP is used. With this model, the part to be cleaned is advanced through a door which can be automated and placed in a receiver mounted on an X/Y-axis system, rotary table, or combination of both, in the process chamber. The part-specific cleaning program stored in the system control unit is started at the push of a button.

The process then runs fully automatically, with all parameters such as movements of the receiver, speed, force and duration of the jet, distance between nozzle and workpiece kept constant as specified in the parts program. In addition, the automated JetStation-HP model has a sensor system for monitoring the cleaning process, which continuously measures the density of the snow jet.

Plug & play concept for rapid deployment

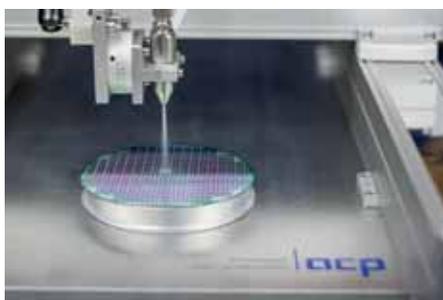
The plug & play concept makes the JetStation-HP cleaning booths quick and easy to put into operation. All the technology for the snow-jet process and media preparation is integrated in the system housing, meaning that only the carbon dioxide and compressed air supply need to be connected up.



QuattroClean technology: four effects for clean surfaces

The cleaning medium used in the QuattroClean process developed by acp systems is liquid carbon dioxide, a by product of industrial processes and thus climate neutral. It is guided through a wear-free two-component ring nozzle and expands on exiting to form fine CO₂ snow. This core jet is then bundled by a separate jacketed jet of compressed air and accelerated to supersonic speed. When the easily focused jet of snow and compressed air impacts on the surface to be cleaned, a combination of thermal, mechanical, sublimation and solvent effects occur. The interaction of these four mechanisms of action removes particulate and filmic contamination in a reliable and reproducible

The before-after image, made under UV light, shows that particulates and contaminations on components made of all technical materials are removed in a process reliable manner



For reproducible cleaning results, all process parameters such as the force and duration of the jet are kept constant in a program-specific manner. In addition, a sensor system for monitoring the cleaning process, which continuously measures the density of the snow jet, comes as standard

process. During the cleaning step, the crystalline carbon dioxide is completely transformed from a solid to a gas, meaning that parts are instantly dry.

The cleaning process is so gentle on materials that it can even be used to clean delicate and finely structured surfaces. The dry quattroClean technology is suitable for parts made from practically any technical material and combination of materials.

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MecWash unveils new Aqua-Save Ultra waste water treatment unit

MecWash has launched a new waste water treatment system that reduces disposal costs by up to 95 percent. The new high capacity Aqua-Save Ultra can process up to 30 litres an hour of waste water from manufacturing processes, complementing the smaller Aqua-Save Junior system, which processes up to 15 litres per hour.

The Aqua-Save range has been developed for the treatment and recycling of industrial waste water, including wash water from parts cleaning equipment, coolant and dye penetrant, reducing the need for expensive off-site treatment and disposal.

The fully automatic Aqua-Save Ultra water treatment system can be added to any aqueous wash system to maintain solution cleanliness and washing performance, to reduce machine downtime, minimise effluent disposal and save money.

The machine boils the waste solution and evaporates the water, concentrating the remaining waste oil and contaminants, which are then discharged. The clean distillate can be reused in the wash system or coolant, or disposed of, subject to appropriate controls and permissions.

While processing twice the volume of the smaller Junior, the Ultra retains a close family resemblance. The versatile nature of



the Aqua-Save Ultra facilitates easy relocation from a wash system to a coolant intermediate bulk container (IBC). The self-contained system comprises a built in waste receptacle and antifoam dosing, in case the waste stream requires it.

A division of MecWash Systems Ltd, Aqua-Save Technologies was established in 2006 to help maintain wash machine water quality and address the issue of industrial waste water disposal from both production and environmental perspectives.

An Aqua-Save Junior now features as a key processing focal point at HS Rowe and Partners. General manager Mark Statham says: "We have positioned the Aqua-Save Junior alongside one of our main aqueous-based washing stations, allowing it to link directly to that process. We also bring in a regular series of IBCs from other processing locations around the site and, with the simple switch of a lever, link these periodically to the Aqua-Save facility. The results in both processing and environmental terms are significant to the extent that complete pay back on the installation will be realised, we believe, within little more than 18 months."

John Pattison, managing director of MecWash, says: "Recycling remains high on the agenda for most manufacturing companies. Businesses are very aware of the environmental, reputational, and financial costs of unnecessary consumption and wastage. The Aqua-Save is a compact and versatile system and demonstrates commitment of delivering on ISO 14001, the international standards for an effective environmental management system.

"The cost savings offered by Aqua-Save products mean the equipment pays for itself very quickly. We have online calculators available on our website to to allow manufacturers to quickly work out the potential cost savings they can achieve."

For more information about Aqua-Save, visit <https://www.mecwash.com/aqua-save/how-it-works/>

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

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Metal cleanliness testing

The CleanoSpector is an easy-to-use handheld non-destructive cleanliness inspection instrument used for measuring organic contamination such as oil, grease and cleaning fluid on metal surfaces. The instrument is widely used in automotive and aerospace industries and allows users to evaluate cleanliness directly at the cleaning process station, on the production line, during field work or in the laboratory.

The instrument has been specifically designed for monitoring cleanliness on manufactured metal parts during and after the cleaning process to ensure surfaces are free of contaminants before the next manufacturing process, e.g. assembly, sealing, gluing, painting, printing, lacquering, laser welding etc. The test results are measured in the degree of the cleanliness of the metal parts in a percentage format or in RFU (Relative Fluorescence Unit).

The measuring principle is simple: the CleanoSpector detects contamination due to its fluorescence, which is excited by a UV light emitting diode (UV LED). The fluorescence intensity depends on the amount of contamination found on the surface at the measuring point, i.e. the higher the fluorescence the more contamination found on the surface.

Advantages of using the fluorescence method for measuring metal cleanliness include: high product quality through controlled cleaning; easy evaluation of the cleaning results by comparing the cleanliness of parts' surfaces with a reference surface; detection of



contamination on parts of various geometry; output of the cleanliness results in percentage or RFU; easy and automatic calibration on a clean reference surface; variable parameter settings, e.g. quantity of measuring points for an optimal adoption on the inspection task; up to 255 parts' profiles available; Administrator & Operator settings available.

The CleanoSpector can also be integrated for automated inline inspection and robot mounted ideal for 3D part inspection.

Application examples for metal cleanliness inspection: cleanliness inspection of metal parts after machining;

inspection of functional surfaces after selective cleaning (laser cleaning, ultra-fine plasma cleaning, CO₂ snow blasting etc.); monitoring the cleanliness of metal parts before laser welding; automotive crank shafts, pistons, cam shafts and con-rods after cleaning; pistons for hydraulic pumps before hardening - residual contamination has an influence on the steel quality in the hardening furnace; stainless steel pipes before coating (vehicle construction; detecting residual agents and

encapsulation material on bond pads before bonding; surface inspection on electrical contacts after stripping of isolation material; gear case parts before coating or bonding; fluxing agent residues on gold bond pads on ceramic substrates; medical device instruments and implants before delivering to the user; cleanliness of parts before vacuum or powder coating; controlling layer thickness of anti-corrosive agents, oils, waxes or bonding agents; cleanliness inspection of sealing groove in aluminium die cast housings for engine control units (ECU), automated driving control unit, power electronics for e-mobility and pumps.

The CleanoSpector is a mobile and robust measuring instrument for flexible use at the process and in the laboratory, with intuitive operation, simple and fast measurement and automatic calibration on reference surface. It offers contact-free cleanliness inspection of part surfaces at push of button, quality assurance of industrial cleaning processes and layer thickness measurement, for example of corrosion protection.

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VOLLMER delivers a pallet full of benefits for US saw manufacturer

Wisconsin-based Integrity Saw & Tool Inc. has purchased a VOLLMER CHX 840 circular saw blade sharpening machine with the VOLLMER HS automated loading station to provide capacity for a significant order the company has won from a new pallet manufacturing customer. The VOLLMER CHX 840 has increased productivity by 60 percent, permitted unmanned running and improved blade quality. Without the VOLLMER CHX 840, fulfilling the new order 'would have been impossible'.

It's a familiar story when an engineer leaves his job and sets up a business from his garage. In the case of Integrity Saw & Tool Inc, the foundations were laid in a basement in 1986 for this saw sharpening, HSS drill and end mill regrinding company that soon outgrew the basement, moved into the garage and employed family members to support the growth. It wasn't until the turn of the century that the Wisconsin business really stepped out of its comfort zone to drive growth and expansion to another level.

It was the move to a 13,000 sq ft factory in 1998, followed by the appointment of fresh-faced engineer Paul Reetz and the



Integrity Saw & Tool is located in Fond du Lac, Wisconsin, on the edge of Lake Winnebago

investment in its first VOLLMER CNC sharpening machine in 2000 that set the company on a new growth trajectory. Now the owner of Integrity Saw, Paul Reetz recalls: "I was paid on a commission basis to bring in new business and for five years, we won 40 to 60 new customers every year. A lot of this was small family businesses such as cabinet manufacturers, construction companies and the Amish community, all

within a two hour radius of our Fond du Lac facility on the edge of Lake Winnebago."

With 13 staff and an output of 100 saw blades a week back in 2000, this output quadrupled to almost 400 blades a week by 2005. During this period, the ISO:9001 certified company realised that its predominantly manual saw sharpening equipment had to be upgraded for current CNC technology.



Integrity's 13,000 square foot factory in Fond du Lac, Wisconsin

Paul Reetz says: "We had two older CNC machines and several manual machines for HSS saws, all of which were struggling to cope with our increasing demand. We looked at the available machines and we chose the VOLLMER Akemat machines as they were in a different class. Back then, VOLLMER Akemat machines had a great reputation for build quality and performance. We bought our first machine in 2000, a VOLLMER Akemat B4 and, over the next eight years, more machines followed as the Akemats clearly lived up to the reputation that preceded them."

The company acquired a further three machines with an Akemat U10 and B10 arriving in 2005, followed by an additional Akemat U10 in 2006. The VOLLMER Akemat machines were bought for sharpening TCT saw blades whilst existing manual machines were manufacturing and servicing HSS blades. This completed the purchasing of VOLLMER machines for almost a decade, until the May 2019 arrival of the VOLLMER CHX840+HS.

Paul Reetz continues: "The saw sharpening side of the business had grown for almost 10 years, but unfortunately the 2008-09 global recession wiped out a lot of small businesses. Many of our circular saw blade customers witnessed the collapse of their businesses as fewer people invested in their homes and real estate.

However, the production of round tools such as drills, end mills, router bits and special tools for the manufacturing industry weathered the market conditions far better. Round tooling for industry currently accounts for 80 percent of our business.

The COVID situation has presented a



Paul Reetz (left) owner of Integrity Saw & Tool with machine operators Marty Jagdfeld (middle) and Tony Lueck (right) in front of the VOLLMER CHX 840 + HS

unique opportunity for Integrity Saw & Tool. With millions of wooden pallets in circulation in the US food industry, Integrity Saw has partnered to regrind TCT saw blades for a leading pallet manufacturer. This new customer has ambitious plans to build multiple manufacturing facilities across Canada, the US and Mexico, with each plant capable of producing a pallet every minute.

"We knew we needed a new machine with automation to meet the demand. The VOLLMER Akemat machines have been amazing and aside from regular preventative maintenance, they have run every day since they were bought. The quality of the machines is amazing. It really is fortunate that we bought VOLLMER and didn't have to worry about it, because we knew they were going to be running. So,

once you have experience with VOLLMER, it doesn't make any sense to look elsewhere. When it came to a new machine, VOLLMER was the only place to look."

COVID may have temporarily slowed the growth timeline for pallet production, but Integrity Saw is well placed to support its new customer with its new 5-axis VOLLMER CHX840+HS for machining the tooth faces and tooth tops in a single clamping operation. The CHX840 is complete with the HS automation solution that enables Integrity Saw to load and process 28 blades unattended. With a customer that will run its operations 24/7 and will require a new saw blade for every shift at every facility, the opportunity for Integrity Saw & Tool is considerable.

Achieving the impossible with VOLLMER

With the arrival of the VOLLMER CHX840+HS, Integrity has been able to rapidly ramp up to the stress-relieving and regrinding of 400 TCT blades every week from May 2019 through April 2020, an impossible feat without this machine.

Integrity Saw did feasibility studies on the blades with VOLLMER whilst it was simultaneously commencing the contract with its existing and ageing VOLLMER Akemat machines. The 18 inch (457mm) diameter TCT blades have 70 teeth per saw and each saw blade can be re-ground up to seven times before being replaced or re-tipped. Before the arrival of the VOLLMER CHX840+HS, Integrity Saw was conducting four operations on three machines to complete a saw blade in 75 minutes, a machining time not inclusive of setups and changeovers. This process chain



The VOLLMER CHX 840 + HS circular saw grinder for machining the tooth faces and tooth tops in a single clamping operation

TOOL & PROFILE GRINDING

included stress relieving, then transfer to an Akemat tooth-face grinding machine and subsequently a tooth-top grinding machine and then the grinding of the 'kick-back' radius to reduce cutting forces on each tooth.

"When the opportunity came to work with the new pallet manufacturing customer, we knew we could not have even dreamed about doing that if we didn't know that there was a VOLLMER machine that can handle that workload, says Paul Reetz. "We make big decisions because we know with VOLLMER we're going to have great service, great training and we don't have to know everything because we know we can ask VOLLMER to get the answers so we can grow our business.

"When it came to programming time and repeated setups, it was approximately 90 minutes for each blade. The VOLLMER CHX840+HS has cut this time by more than 60 percent to 35 minutes with just one stress-relieving operation before the CHX840 completing all tooth and face grinding in a single setup. We only did a couple of stacks of blades with the older VOLLMER Akemat machines, but the time study demonstrates the difference."

The 27-employee company has just two skilled operators running four VOLLMER Akemat machines and the VOLLMER CHX840+HS. The new machine has doubled the weekly output with the same number of staff. Paul Reetz continues: "The two operators previously had the capacity to do 40-50 TCT blades a day on the Akemat machines, but by adding the VOLLMER CHX840+HS, we can now re-grind over 100 blades a day.

"We work from 5 am to 3 pm and the HS automation system allows us to set the VOLLMER CHX840 machine in the afternoon and it will process up to 28 saws unmanned throughout the evening. If we worked a shift pattern, we could run the VOLLMER CHX840 24 hours a day to gain more capacity. However, we are already looking at our next VOLLMER purchase."

More than productivity

While the new VOLLMER CHX840+HS has increased productivity and capacity, the benefits reach much further. Integrity Saw has recognised the facility to grind tooth tops and faces in a single operation has the potential to make single-purpose machines redundant in the future. With a single 'compact-footprint' VOLLMER machine, Integrity can significantly increase output



Machine operator Tony Lueck in front of the VOLLMER Akemat B10

whilst reducing machine inventory and running costs, maximising its 18,500 sq ft of factory space.

The operators undertook 2.5 days of training on the CHX840+HS and this was more than sufficient. Paul Reetz explains: "While the older machines have all the programs stored, the VOLLMER CHX840+HS didn't initially have that luxury. However, the easy-to-use CNC interface means our operators don't have to program every blade from new. They can simply edit one of the hundreds of stored program templates within the software to rapidly generate a suitable program. This means a stack of 28 saws for unmanned running can be programmed in just over five minutes. We are continually adding more saws and programs to the CHX840 and this will help us as our production of saws for the metal cutting industry expands."

Additionally, the operators no longer have to be concerned over grinding wheel offsets as the CHX840+HS automatically compensates for wheel degradation, ensuring that the precision and quality of the final saw in an unmanned batch run is as impressive as the first saw. The combination of probing, automated wheel offset calibration and the intelligent software on the CHX840 also eliminate the potential for operator error and collisions.

Looking to the future

When the pandemic gradually subsides, the VOLLMER CHX840+HS will eventually reach capacity in line with the customer demands for saw blades for pallet production. Integrity Saw already has its sight set on a second VOLLMER TCT saw sharpening machine with automation to

meet these production demands as and when they arise. Furthermore, the company has been so impressed with the VOLLMER CHX840+HS that it is now considering the latest generation of VOLLMER machines for its rotary tool division.

The Integrity TCT saw department is seeing increased demand from the metalcutting industry from solid bar steel stockholders and the VOLLMER

CHX840+HS will also have a part to play in developing this business.

"We are moving more steel industry saw blades to the CHX840, as 10 to 12-inch (250 to 300 mm) saws can be produced much faster. The production time for grinding the outside diameter and chip breaker can be more than 25 minutes on the Akemat machines, while the CHX is doing this in less than 15 minutes. Also, some 80 tooth saws can be finished on the CHX in 8 minutes as opposed to 15 minutes on the Akemat with the chip breakers being added manually afterwards.

"The potential for savings is considerable and this is a rapidly growing part of our business. The VOLLMER machines have proven themselves to be 'bullet-proof' and they are built to last. More than this, the technology and innovation are helping to drive our business forward," concludes Paul Reetz.

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Remote maintenance solutions keep United Grinding closely in touch with customers

The potency of remote maintenance and customer assistance, especially harnessing the power of smart phones, has never been demonstrated more forcibly than during the past year when the Coronavirus pandemic has forced lockdowns across the globe. However, the United Grinding Group has increasingly used technology to support its worldwide customer base and, in many cases, keep machines running with minimal downtime.

According to United Grinding Group company Walter Ewag UK, the Group's Digital Solutions embrace three main offerings for the users of member companies' wide range of grinding solutions; Production Monitor, Service Monitor and Remote Service. The first two help customers keep track of production, for example, highlighting when maintenance work is required and where/when problems may arise in production. Remote Service is designed to help support the help desk over a data connection. But why use this route rather than simply 'phoning the help desk?

Neil Whittingham, Walter Ewag UK's sales director says: "Technical enquiries on the phone without image support can be very lengthy. That's why the United Grinding Group has integrated our established Conference Center into Digital Solutions. The Conference Center app has now been



redesigned so that we can reach customers via their smart phones."

One example of Remote Service in action concerns the machine's backup battery. This maintains the power supply of a control system in the event of a power failure and it must be changed from time to time. The machine operator receives a notice on the operating panel in a timely manner, and the production manager would have seen this on the Production Monitor. The user manual and installation instructions are available to both of them via the Customer Cockpit but they can also send a service request directly through the Digital Solutions app.

The service technician will be connected

live via the Conference Center and will be able to be provided with tips and hints. Images can be sent via the whiteboard function and the helpline technician can draw markers directly into the images.

"There were 2,500 demands for remote service during 2020," says Neil Whittingham, who adds that United Grinding North America also performs preliminary machine acceptances remotely. "The application team produces videos of the required processes by mounting a GoPro camera in the machine, using a time code to document the duration of the relevant process cycles."

Other digital tools are also being worked on, including smart glasses. These offer a number of benefits including the fact that the technician at the machine can have his hands free while the Help Desk specialist also shares the same view. An extension of this would be the application of contextual information via augmented reality.

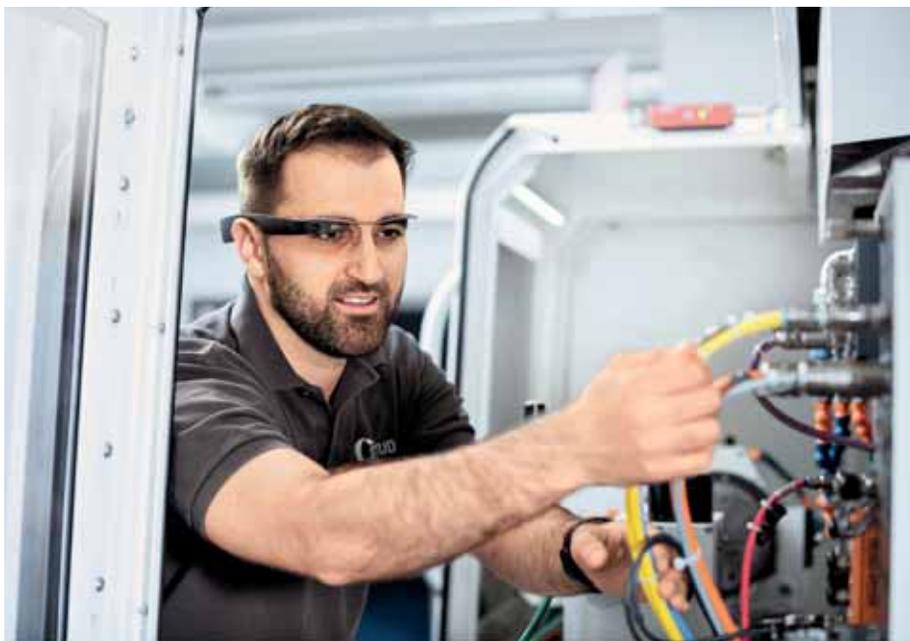
The use of technology to help customers remotely does not only apply to repair and maintenance; remote process optimisation is also a possibility, using data from the Production and Service Monitors. That would effectively create a full circle of digital solutions for the United Grinding Group and its customers.

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Grind barrel shape ballnose endmills outperform with ToolRoom's latest update

Tool end-users bank cost and time savings with BSB cutters with exceptional large-radii geometry

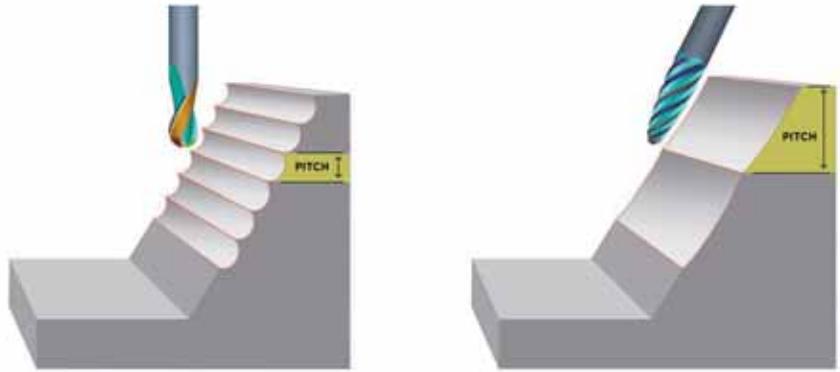
You can discover new possibilities in machining with the Barrel Shape Ballnose (BSB) tooltype in ANCA's up-to-the-minute ToolRoom software. The latest enhancement also includes revamped Double Corner Radius (DCR) Endmills. These endmills constitute a new tool class for machining excellence. Barrel and lens shapes and taper and oval forms are relative market new-comers and are predominantly used in the die mould, aerospace, general machining and power generation industries.

ANCA Software product manager, Thomson Mathew says: "The ability to create endmills with a larger-radius edge, permits greater stepover increments. This enables machining with a larger cross over pitch during pre-finishing and finishing operations, improving productivity."

Shorter cutting distances mean it's almost like a two for one coupon for longer tool life and faster cycle times.

Thomson Mathew adds: "Replacing conventional ballnose and corner radius applications with the large tangential form radius simulates these applications but the outsized cutting diameter is what saves cycle time and cost; and the resulting surface finish is better as well."

"Bringing these new endmills together with the expert advantages of ToolRoom such as iView and laser compensation, designer edge ballnose, variable helix and

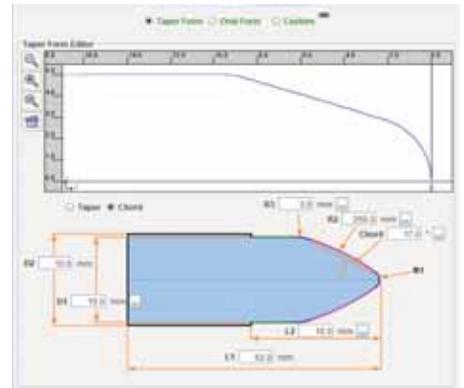


Large step over increments contribute to faster cycle times and longer tool life

tool balancing sets tool manufacturers up with a complete solution and is unique to ANCA software. In addition, a special fluting operation ensures a constant hook angle all the way along the trajectory of the cutting edge resulting in vibration-free tools, with less wear and tear during machining."

Innovation and flexibility in ANCA's software has always been an intrinsic partner to tool machines' functionality. With a legacy of first-to-market software features, this enhancement continues to advance the sophistication and application diversity of ANCA's dedicated cutting tool software package. Clever features offer customers the machining capabilities needed for today's market.

Thomson Mathew adds: "ANCA has been



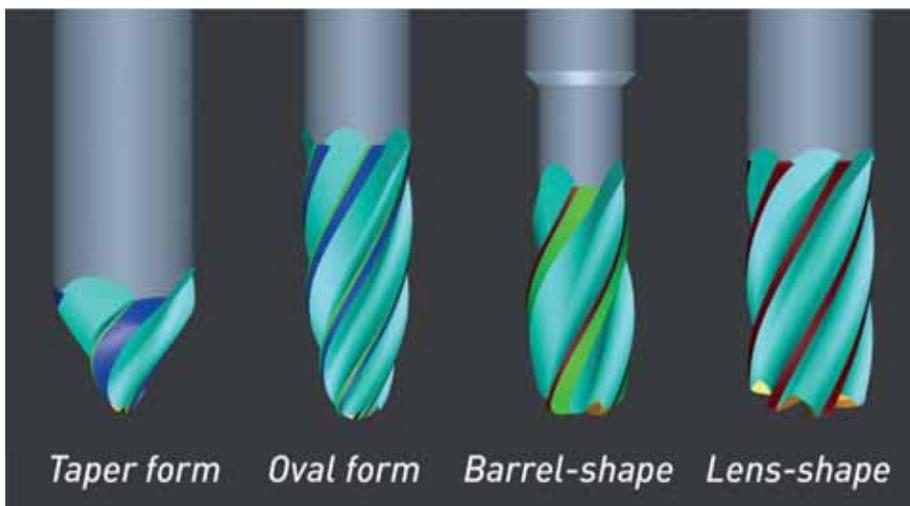
Both a static and dynamic view are supported

leading the industry in terms of new features, cycles, cutting tool geometry and functionality in our cutter grinder software for over two decades and this latest release extends this further."

The upgrade offers wizard based design for user-friendly operation

Manufacturing complex, sophisticated endmills is made easy with wizard based BSB design in ToolRoom, suitable also for catalogue production.

BSB and DCR tool types are high performance endmill cutters, mainly used for finishing requiring high accuracies. They may be more familiar to some as circular segment or high feed endmills. In the current market, cutting tool manufacturers may be looking to enter new markets and this software release makes diversification with high-quality specialist tools attainable.



The ToolRoom update includes new ToolTypes

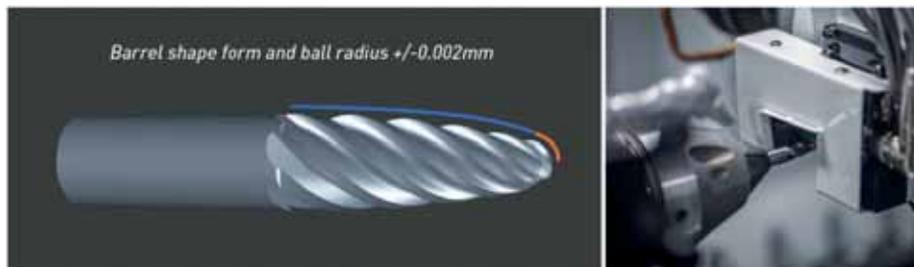
This sought-after enhancement retains ANCA's renowned software user-friendliness and completes the ToolRoom RN34 endmill package.

Features of the new market release encompass compensation and accuracy

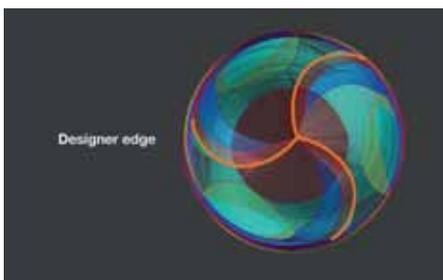
Compensation methods are covered as ANCA supports manual, iView and LaserPlus compensation for all geometry, as these tools are highly accurate. Both ball radius and tangential barrel form radius can be maintained within +/-0.002 mm using LaserPlus. This accuracy can also be maintained in batch grinding with automatic in-process compensation for large volume production on machines with LaserPlus.

The wizard-based design also provides the option to scale tools and add various other operations like roughing or chip breakers. Wizard support is available for oval form, taper form and also a custom form for specials. A static view gives parameter inputs for geometry description and there is also a dynamic view available to visualise the geometry as and when parameters are entered.

Multiple practical advantages of



Using LaserPlus both ball radius and tangential form radius are maintained within +/-0.002mm



Designer edge Ballnose for aggressive nose section cutting

ToolRoom software for cutting tool manufactures comprise: iView and laser compensation for large volume manufacturing; designer edge ballnose for aggressive cutting; variable helix/index with radial margin option for fluting cycles; tool

balancing for variable helix/index tools for chatter free cutting; constant hook along cutting edge trajectory (special flute from solid); very user-friendly GUI with static and dynamic view specially for catalogue tools.

ANCA CNC grinders are used for manufacturing precision cutting tools and components across a diverse range of competitive industries including cutting tool manufacture, automotive, aerospace, electronics and medical.

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VOMAT ultra-fine filtration technology for the tool grinding industry

Keeping coolant extremely clean for a long time in large batch tool production

The larger the batches in tool grinding and the more grinding machines are involved in the process, it becomes more worthwhile to employ efficient central filtration systems or large filters for cleaning contaminated grinding oils or aqueous coolants as offered by filtration specialist VOMAT.

VOMAT offers systems that can be individually adapted to customer-specific production needs. One example is the compact system KFA 1500. The KFA 1500 is a highly efficient, low-maintenance ultra-fine filtration system for grinding carbide and HSS materials with a filtration capacity of 1,500 litres/min. (397 gallons/min). The KFA 1500 keeps the cleaned coolant in the system for extremely long periods and does so in an energy-efficient manner, even with handling large tool batches.

The selection of the correct filtration system is an important aspect for success in

tool grinding. VOMAT is a specialist in filtration technology for cooling lubricants in the metalworking industry. The product portfolio includes stand-alone, modular and central systems. VOMAT also designs and builds one-off customer-specked units with central and decentralised functions.

VOMAT ultra-fine filter systems are available in various sizes ranging from 70 litres (18.5 gallons) up to large filtration or central systems with 960 or 1,200 litres (254 or 318 gallons) flow capacity per minute. In case filtration capacity requirements increase, when for example a host of grinding machines are to be supplied with clean oil centrally, then the large VOMAT ultra-fine filtration systems come into play.

Steffen Strobel, technical sales manager at VOMAT, says: "Tool manufacturers or regrinders can also order VOMAT filters,

which can be scaled-up in 1,200 litre/minute (318 gallons) increments. The large selection of modules and additional optional features allows for maximum flexibility.

"Our KFA 1500 compact system is a fine example of how economical ultra-fine filtration can work when grinding large batches. These systems can filter large amounts of dirty cooling lubricant at constant temperatures. The extremely cleaned oil can remain in the system for a long, long time."

KFA 1500 for large tool lots

The tank system of the VOMAT KFA 1500 consists of the dirty oil inlet tank, the clean oil tank and the disposal unit. The tank volume is 10,000 litres (2,645 gallons). The KFA 1500 filters have a cleaning capacity of 1,500 litres/minute (396 gallons/min). Modern, low-maintenance and user-friendly



technology ensure energy-efficient full-flow filtration, in which clean and dirty oil are separated 100 percent.

Modern high performance precoat filters (KFA 1500 footprint: 6,610 x 2,530 x 2,620 mm (L x W x H) filter to NAS 7 operate for a very long time. This corresponds to 3 to 5 μ m.

Steffen Strobel adds: "The KFA system filters and flushes as the need arises. This means that the backwash-cycle is initiated automatically and individually for each filter element, depending on the degree of contamination. Meanwhile, the other filter elements ensure a continuous supply of clean oil. This not only ensures that the filter and grinding oil can remain in the system for a very long time, but also that the system operates in a particularly energy-efficient manner. The fully automatic monitoring and control system of the KFA 1500 keeps energy and operating costs low."

The cooling performance of the cold water cooling system of the KFA 1500 operates at 200 kW with a constant oil temperature of 24° in continuous operation. The temperature accuracy is within a tolerance range of up to +/- 0.2 K. This means that the grinding oils used have long

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life cycles. As an option, VOMAT offers compressor cooling systems with external condensers and high control accuracy.

Due to the use of precoat filters, there is no contamination of the swarf by any filter aids. The residual moisture of the metal chips is between five and 10 percent, and the recyclable material is disposed directly into a suitable transport container provided by the recycling company.

Thanks to the PLC control and software technology, remote maintenance of the KFA 1500 is also possible without any problems. A wide range of optional features make the VOMAT KFA 1500 filtration system extremely flexible. The VOMAT KFA 1500 can be adapted to a wide variety of work conditions and can be easily integrated into any workflow due to available optional equipment. For example, there are various pre-filter systems (material-dependent) and drying units.

Steffen Strobe concludes: "State-of-the-art grinding technology in combination with VOMAT ultra-fine filtration technology gives the tool manufacturer the certainty of producing consistently high tool quality with ultimate process reliability, even in a large batch tool manufacturing environment."

With the KFA 1500 filtration system, machine manufacturer VOMAT provides tool manufacturers and regrinders, with a highly efficient, low-maintenance ultra-fine filtration system that promises optimum quality even in large batch production environments.

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In-line blast cleaning for a wide range of castings

Highly adaptable continuous feed spinner hanger machine for foundry applications

When a Russian manufacturer of mining equipment set up a new foundry, the company chose an RHBD22/27-F continuous feed spinner hanger shot blast machine from Rösler to finish its castings. Besides the heavy-duty foundry design ensuring high cost-efficiency and uptimes, the customer was impressed by the operational adaptability of the blast cleaning system. It allows in-line core sand removal and blast cleaning of castings made from different metal types.

For more than 90 years, the Tomsk Vakhrushev Electromechanical Plant, JSC (TEMZ) has manufactured mining equipment and machinery for other industries. Its product portfolio includes fans, jackhammers, pneumatic and hydraulic tools, as well as electrical drill presses and saws. The company produces the required equipment components as steel, grey iron and aluminum castings at its location in Siberia. A major customer demand for the new TEMZ foundry operation was that the new shot blast machine must be able to cope with the wide variety of different castings. Other requirements were a high cost efficiency and high equipment uptime. Evgeny Laza, chief technologist at TEMZ, explains: "It was very important for us that a supplier had at least 15 years' experience in building shot blast equipment, maintains a service organisation with a spare parts warehouse in the Russian Federation, has a proven track record with this type of equipment and is an innovator in the field of shot blasting." Moreover, the new blast system had to be integrated into the manufacturing flow in an existing building, which because of the tight space conditions posed a significant challenge to the Rösler engineers.

Well designed, robust equipment concept for foundry operations

One reason why Rösler was able to secure this order against numerous competitors was that the RHBD 22/27-F continuous feed spinner hanger shot blast machine was specially designed for foundry operations with heavy duty wear protection. For example, the blast chamber is completely fabricated from manganese steel. In addition, the "hot spot" area contains a wear lining that consists of replaceable cast and case hardened wear plates. All other sections inside of the blast chamber are equipped with easily exchangeable manganese steel plates. The customer was also impressed by the flexibility of Rösler to adapt the blast machine to the specific space requirements at TEMZ. Evgeny Laza explains: "When it came to the development of solutions and the handling of all technical details, Rösler reacted a lot faster than the other equipment suppliers. Everything it did was focused on our specific requirements." Another positive factor was that since 2012 the company has already been successfully operating three shot blast machines from Rösler.

Fully automatic in-line blast cleaning adapted to a variety of different workpieces

The continuous blast machine is equipped with an integrated transport system that allows the handling of single workpieces or workpiece batches, weighing up to seven metric tons. Workpiece loading can take place at both ends of the blast machine. After shakeout the castings are transferred to the transport device of the



The transport system of the shot blast machine can handle castings weighing up to seven metric tonnes

shot blast machine with carriages supplied by the customer. There they are placed in a special lifting device and lifted up. Once the parts are in place the operator enters the part specific blast program into the PLC and drives the workpiece trolley into the blast chamber.

The blast chamber is equipped with four Gamma 400 G turbines with a drive power of 22 kW each, arranged in-line. During the blast process the castings are continuously rotating. The high performance turbines, designed and built by Rösler are equipped with throwing blades in a "Y" shape design. Compared to conventional turbines they generate an up to 20 percent higher blast performance whilst simultaneously maintaining lower energy consumption. In addition, the throwing blades can be switched around allowing the use of both their sides. A blade exchange takes place with a quick-change system without having to remove the turbine. This results in uptimes, which are at least twice as long compared to conventional turbines.



The special equipment design for heavy-duty foundry operations incorporates optimal wear protection: The blast chamber is completely fabricated with manganese steel and contains special cast, case hardened replaceable wear plates in the "hot spot" area. All other blast chamber sections are equipped with replaceable manganese wear liners

Automatically adjustable shell valves allow for adaption of the blast media flow, up to a maximum of 290 kg/min (640 lbs./min) to the castings being blasted. The rotational speed of the turbines and the spinner/hanger trolley can also be adjusted to the respective blast cleaning task by frequency inverters. Before travelling to the unload station the cleaned parts pass through a cleaning station, where residual sand can be removed with a manual compressed air system. All these process parameters are stored in the individual blast programs and ensure the perfect adaption to the various shot blast tasks. For example, aluminum castings require a lower blast intensity than steel castings. The system control allows access to 30 specific programs for different castings, as well as the blast cleaning after heat treatment. A special program for de-coring (core sand removal) allows the turbines to be switched on sequentially, allowing the removal of the sand in layers, which prevents the media recycling system to be overloaded.

Media recycling with cleaning efficiency

The media recycling system was also designed to keep the wear rate at a



The energy efficient Gamma 400 G high performance turbines with a drive power of 22 kW each allow a maximum blast media throughput of 290 kg/min (640 lbs./min). Automatically adjustable shell valves allow adapting the blast media flow to the respective casting types

minimum. The sand/media mix is first passes over a vibratory screening unit where coarse particles and sand lumps are discharged. Then the mix passes through a magnetic separator. A finely tuned guide system evenly distributes the media/sand mix over the entire width of the drum to generate an extremely thin curtain of sand and media. This, combined with the high attractive force of the electromagnets in the drum, generates a separation efficiency of up to 99.7 percent.

The replenishment of blast media is a fully automatic process. A sensor in the media hopper monitors the media level. As soon as the level falls below a defined value, media is added in small quantities. This ensures a homogeneous operating mix and guarantees consistent, repeatable blasting results. Because of the aluminum castings, the dust collecting system for the blast machine consists of an explosion protected wet dust collector with automatic sludge discharge.

Easy maintenance and quick service

TEMZ also demanded a maintenance friendly equipment design guaranteeing a high uptime. A large maintenance platform allows easy access to all components requiring regular service. Remote electronic access by Rösler service engineers to the



Because of the aluminum castings the dust collecting system is designed as explosion protected wet dust collector with fully automatic sludge discharge

system controls permits quick trouble shooting in case of a malfunction and support for programming or changing of programs. Evgeny Laza concludes: "Rösler not only handled all tasks quickly and professionally but also provided optimal support to our people. This resulted in trouble-free operation of the shot blast machines in our company for more than five years."

Rösler Oberflächentechnik GmbH is an international market leader offering total solutions in the field of mass finishing and shot blasting, painting & preservation systems and mass finishing consumables. In addition, Rösler offers a broad spectrum of surface finishing technologies (deburring, descaling, desanding, polishing, surface grinding) for workpieces made from metal and other materials. Headquartered in Germany with plants in Untermerzbach/Memmelsdorf und Bad Staffelstein/Hausen, the Rösler group also maintains sales and manufacturing branches in Great Britain, France, Italy, the Netherlands, Belgium, Austria, Serbia, Switzerland, Spain, Romania, Russia, Brazil, India, China and USA.

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ActOn Finishing launches new shot blast systems

ActOn Finishing has announced the launch of a new shot blasting series, which includes suction blast, pressure blast and wet blast cabinets. These machines are designed to guarantee reliable operation and a long service life. ActOn shot blasting cabinets offer the possibility to achieve a wide range of finishing applications.



The Premium Series

The Premium Blasting Series includes a range of DI suction blast, NP wet blast and DP pressure blast machines. These machines have been designed for blasters with high requirements when it comes to blasting results, user convenience, safety and environment.

The DI suction blasting cabinets are equipped with a cyclone, which guarantees

provides an agitation so that the abrasive continues to “float”. NP wet blasting cabinets are perfect for applications such as cleaning, descaling, deburring, roughening, oil or grease removal, die cleaning as dimensions are not affected, or to achieve a smoother surface.

The DP pressure blasting cabinets are equipped with a cyclone, which guarantees that the abrasive is cleaned perfectly. This results in less wear and better visibility. The pressure pot is equipped with a dosage cylinder which always ensures the right mix of abrasive and pressurised air. Also, the dosage cylinder controls a constant flow of an abrasive, even at the start of the blast process. This results in an effective and efficient blast process.

The automated blasting cabinets

The main advantages of the ActOn automated blasting cabinets are the reduced manual handling and consistent high-quality finishing results. The automated

ActOn shot blasting technology

The ActOn offering includes a range of economical, premium and automated shot blasting machines. These blast cabinets are designed for blasters who require rapid, repeatable and efficient blasting results, a process free of interruption and a shot blasting machine with a solid construction. More over all components are assembled, according to ISO-certification, to create a compact turn-key unit.

The new range of shot blasting equipment will include the ECO shot blasting machines, Premium blasting cabinets, automated shot blasting equipment and a special range for the additive manufacturing market.

The ECO Series

The ECO Blasting Series includes an economical range of suction blast and pressure blast machines. These machines have been designed to allow you to minimise your investment while enjoying the benefits of a good quality shot blasting machine. Both the ECO MI Series (Suction Blast) and the ECO MP Series (Pressure Blast) are built to achieve a rapid and efficient finish.



that the abrasive is cleaned perfectly. This results into less wear and better visibility.

The suction blast pistol ensures, in combination with the mixing chamber, a constant optimum mix of pressurised air and abrasive, to offer an effective and efficient blasting process.

The NP wet blasting cabinets are equipped with a special pump that achieves a constant flow of blast media and water to the blast nozzle.

The media and water is mixed with pressurised air to add extra power and speed to the mix. The result is a very smooth finished component. The water and abrasive are collected in a funnel, and the pump

systems are operator friendly, and can be custom built to suit your needs. You are offered full support every step of the way.

This range includes: satellite blasting cabinets, drum blasting cabinets, transit blasting cabinets, turntable blasting cabinets, shot peen blast Installations, internal blasting cabinets and roller and tube blasting cabinets.

ActOn Finishing MD Sid Gulati says the ActOn Blasting Cabinets fit perfectly with the firm’s existing range of mass finishing products. He states: “We are continuously developing and adding new products to our range of finishing solutions and are certainly excited with our new range of shot blast technology. ActOn are here to offer you a complete solution.

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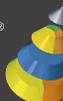
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Guyson airwash cabinet for cleaning railway braking systems at Metro Madrid

Leading Finishing equipment manufacturer, Guyson International Limited, along with its Spanish distributor, Materias Primas Abrasivas, S.L. (MPA), has recently supplied and installed a Guyson Euroblast 8 Airwash cabinet into Metro Madrid's main maintenance workshop for removing dust particles and other contaminants from the braking systems of underground trains.

The health and safety and wellbeing of Metro Madrid's maintenance staff was the primary concern when selecting the Guyson airwash system. The Euroblast 8 blow-off cabinet provides a sealed work chamber for safely air-washing braking systems utilising a hand-operated airwash gun. Removing dust, dirt and debris from underground train braking systems is a daily maintenance task for the Metro team so maintaining a clean and safe work environment without leaking dust, dirt, debris and noise into the work environment is essential.

The cabinet is fitted with two airwash guns, high pressure and low pressure, which can be easily selected by the operator depending on the type and/or volume of contaminant, high pressure for aggressive removal of caked-on dust or low pressure for lighter material. In order to retain high-visibility during the brake cleaning process a Guyson C400 cartridge dust collector is connected to the rear of the cabinet effectively removing the loosened dust and airborne particles into its collection bin, so they can be safely disposed of whilst maintaining a clean working environment.

Due to the numerous types of braking systems, some of which are extremely heavy, the Metro Madrid maintenance team selected this Euroblast 8 blow-off system with the optional side loading turntable which enables large heavy items to be loaded directly onto the turntable via crane or forklift. The turntable is then easily pushed into the cabinet and can be rotated by hand during the cleaning process to provide all-round access.

Guyson's range of Euroblast Airwash cabinets incorporates the full Standard Euroblast range of cabinet sizes, delivering exceptional component access; with doors on the 6, 7 and 8 models opening to the front, top and side to facilitate easy loading of components. The range extends all the way up to a 2.5 m square cabinet (pictured), with capacities up to two-tons and a loading mechanism with the easy-to-wind side loading platform.

Guyson's extensive range of Euroblast Airwash cabinets enables even the largest items to have the dust and dirt cleaned off inside a safe and uncontaminated working environment, without the need for cumbersome, uncomfortable and restrictive PPE.

Guyson is a privately owned family company with a world-wide reputation for excellence in the design and manufacture of blast



An MPA Service staff member installing cabinet into Metro Madrid Workshop



finishing, spray wash and ultrasonic cleaning equipment, as well as being the UK supplier for all your hose and coupling requirements.

If you would like to improve your operator health and safety whilst airwashing components, contact Guyson's Customer Service Department now to arrange free trials on your components, prove the process and make recommendations on the most suitable airwash cabinet for your needs.

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Automated blasting technology for optimum preparation of fasteners

Based in Reuver (NL), the Thielco Steel Solutions Group specialises in professional surface treatment of both large and small steel components for a variety of industrial applications, including the automotive sector, offshore wind, oil and gas and the building and transport industries. Thielco also produces gratings and steps. The company is regarded today beyond the Netherlands as an expert for surface treatment of steel parts through galvanising (hot-dip, hot-dip centrifugal and mechanical) and powder coating.



Thielco has been the sole licence holder in the Netherlands since 2007 for the Geomet® chromium-free coating technology of N.O.F Metal Coatings Europe s.a. Geomet technology is water-based and offers an environmentally friendly alternative to conventional coating or galvanising of smaller metal products. A zinc-aluminium laminated coating is applied to the component in a specially designed fully automated production line. This achieves extremely high corrosion resistance and avoids hydrogen embrittlement.

Companies such as Thielco that have acquired the Geomet licence are subject to the strictest production and quality control and inspections by the licensor N.O.F., thus ensuring the best-possible corrosion protection today for steel parts from a technical point of view. Thielco also conforms to the international IATF 16949 quality standard for the automotive industry for Geomet coating of steel parts. Many automobile manufacturers use screws and other small steel parts that are surface treated with Geomet at Thielco. In addition to automotive applications, Geomet-coated components are also increasingly used in the transport industry and wind turbines.

A new production line for fully automated Geomet coating of rack goods was designed and implemented together with the plant manufacturer WMV Apparatebau. One of the key processes involved here is blasting. Only a perfectly prepared surface will also result in a perfect coating finish that complies with strict Geomet requirements. Two AGTOS hanger-type blast machines (type HT 11-13) were selected for the blasting process. Each of these is equipped with two high-performance turbines, each delivering 11 kW of drive power.

The third system (also a type HT 11-13) is used for decoating and cleaning the racks. All three hanger-type blast machines can handle a maximum workpiece height of 1.3 m and width of 1.1 m. The blast

machines operate with automatic abrasive volume control (via pre-set value) and have a connection for cartridge filter units.

2015 saw renewed investment in an AGTOS blast machine, but for hot-dip galvanising of rack goods in a second Thielco production plant. This system is a linked continuous overhead rail shot blast machine of type DHT 10-08. One special feature of this coating line is the automated loading and unloading of workpieces on the racks using robots, a system developed by the customer.

The largest investment to date was made in 2018 in new blast machines for the Geomet small parts (bulk material) coating line which has been in operation since 2007.

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

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Walther Trowal expands in the United States

Walther Trowal has significantly expanded the facilities of its subsidiary in Grand Rapids, Michigan, that was founded in 2005. It now offers its customers in North- and South-America "just-in-time" delivery times for the mass finishing media and compounds. In the substantially upgraded "Process Development Lab" experienced and knowledgeable application engineers assist the customers to optimise the surface finishing solutions for their workpieces.

With the move into a substantially larger facility the Walther Trowal LLC in Grand Rapids, Michigan, has now eliminated the disadvantages of two separate physical locations. With a total area of more than 4,000 m² all the company's business functions are now under one roof: Sales, service and administration and a threefold larger warehouse area for machines, compounds and media.

Walther Trowal has also expanded the "Process Development Lab" that is now equipped with a variety of different finishing machines. It allows the American customers to quickly run processing trials with their workpieces in Walther Trowal machinery and, jointly with the company's application engineers, improve their finishing processes. The lab is not only equipped with mass finishing and shot blast machinery but also coating systems for mass produced small parts.

In the "Tech & Training Centre" Walther Trowal offers application and training seminars, which are primarily attended by distributors but also by customers from the automobile, machinery building and aerospace industry.



All Walther Trowal business functions are now located under one roof on an area of more than 4,000 m²

With the new facility Ken Raby, vice president and general manager of Walther Trowal LLC, can now serve his North and South American customers even better: "We have significantly expanded our warehouse capacity. This enables us to ship standard media and compounds to our customers from Grand Rapids "just-in-time". In addition, we are stocking numerous mass finishing machines, which can now be shipped instantaneously,"

Several application and sales engineers at the Grand Rapids office support the already existing nine distributors in the United States and Canada, including the subsidiary company in Queretaro, Mexico. At this location, Walther Trowal LLC founded the Walther Trowal S.A. de C.V. in January 2020. With initially three employees, this office has also a test lab and a sizable stock of Trowal products.

Christoph Cruse, general sales manager at Walther Trowal in Haan/Germany,

explains why the company is further expanding its presence in the Americas: "We see a continuously growing flow of customer enquiries and purchase orders from North- as well as South-America. Both markets are undergoing a steady growth. With short response times, a large warehouse capacity and intensive on-site technical support, our American customers have perceived us for quite a while as a local player in the field of surface finishing."

Walther Trowal produces all its mass finishing, shot blasting and coating equipment, as well as compounds and plastic media, at its headquarters in Germany. Ceramic grinding and polishing media are still produced in the UK at its facility in Stoke-on-Trent.

Surface finishing technologies from the inventor of the "Trowalizing" process

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", since when 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.



Compared to the old location, the warehouse space for machinery, compounds and media is now three times larger

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 work piece and each manufacturing process must meet special technical requirements. That is why the experienced process engineers in our test lab, in close cooperation with the customers, develop the optimal process technology for the finishing



The "Process Development Lab" allows the customers to quickly run processing trials with their own work pieces in Walther Trowal equipment



In the "Process Development Lab" customers have the opportunity to test the Walther Trowal equipment with their own workpieces

task at hand. The result: workpiece surfaces that meet exactly the required specifications, with short processing times and a high degree of consistent, repeatable results.

Walther Trowal is one of the few manufacturers that develop and produce 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 work pieces 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



The "Process Development Lab" is also equipped with machinery for the application of coatings on mass produced small parts

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.

Walther Trowal serves customers in a wide range of different industries all over the world, for example, automotive, aerospace, medical engineering and wind power.

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ASG strengthens its manufacturing offer with King & Fowler acquisition

Aero Services Global Group (ASG) has acquired one of Liverpool's oldest surface treatment specialists and is now looking to maximise its new 'one-stop' capability with aerospace clients across the world.

The Manchester-based Group, which is run by Simon Weston and backed by Amin Amiri of a2e Industries, has purchased King & Fowler in a deal that will safeguard all 59 jobs and signal a new investment drive in processes and plant at its Liverpool factory.

The move will enhance the group's operating efficiencies, provide access to an extended blue chip client base and make the most of a number of synergies that should increase sales for both parties. It also brings a new manufacturing discipline to the rapidly expanding North West group, with it now able to access world class anodising, plating, heat treatment and non-destructive testing.

This means that ASG will be able to deliver a 'one-stop' engineering portfolio from tooling and machining to assembly and finishing.

Simon Weston, Group MD of ASG enthuses: "We are delighted to welcome King & Fowler to the ASG family and see this acquisition as a strategic fit, adding more capability to our portfolio. This acquisition strengthens our commitment to our customers, providing end-to-end capabilities for commercial and military aerospace contracts.



"Its reputation in the aerospace sector is well respected, with Nadcap accreditation and over 15 customers approvals already in place. More importantly, it has unrivalled expertise in the surface treatment of critical components and, with renewed investment, we believe we have the opportunity to grow sales by 30 percent over the next twelve months.

"This will involve the creation of a number of new jobs and the opportunity to complete work for other domestic and international member companies in ASG."

Mark Huddleston, who remains as director of King & Fowler, adds his support: "We have joined a well-managed, growing and ideally positioned group, with a clear vision of providing world class services to customers and deploying a 'partner of choice' ethos.

"While we have been approached on a number of occasions by potential buyers, the investment record and market growth of ASG made this the right next step and we

look forward to upgrading our facilities whilst supporting the group in their strategic objectives."

Manchester-based Aero Services Global Group manufactures and sub-assembles detail airframe structural equipment and aero engine components for more than 20 leading OEMs and Tier 1 suppliers.

Founded in 2015 with the aim of helping a global customer base consolidate their supply chains through innovation and efficiencies, it started operations with the acquisition of Phoenix Ltd and now boasts eight subsidiary companies, including Queens Award-winning Arrowsmith Engineering, B&H Precision Tooling, Datum, Ludolph, TGM and AMF Precision Engineering.

The group, which employs over 350 people and boasts annual sales of £43m+, is split into two core divisions focusing on aerospace and tooling, providing a wide range of products from simple brushes, complex mill turned components and small, medium and large 5-axis milled parts to tooling, transportation media and fixtures for existing and next generation aircraft fuselages and wings.

Amin Amiri, founder and CEO of a2e Industries, has developed ASG with Simon Weston, completing eight acquisitions over the last six years. He concludes: "It is pleasing to witness the birth and continuous strategic development of our business. We will cultivate King & Fowler's capabilities as a transformative catalyst to enhance shareholder value and profile in the industry."

Aero Services Global Group was advised by Claire Checketts and Sarah Maddocks of Shoosmiths Solicitors LLP, with the Huddleston family advised by Richard Moorehead of HNH Group.

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New heat shield technology delivers a massive 35 percent improvement compared to conventional heat shield solutions

Automotive and motorsports heat management specialists Zircotec is launching a new heat shield solution, ZircoFlex® SHIELD which outperforms traditional products in weight, thermal performance and packaging space, depending on the needs of the user, according to a detailed research program carried out by the company.

This revolutionary patented technology comprises a traditional insulation core combined with Zircotec's proprietary thermal barrier coatings. Whether the need is to improve performance, decrease weight, or save space, ZircoFlex SHIELD delivers against all these criteria: at half the thickness of the next best heatshield from another manufacturer, ZircoFlex SHIELD achieves a 40 percent improvement in heat shielding with as much as a 125°C reduction in surface temperature in exhausts: it secures the same performance of the next best competitor in almost half the volume; the weight of the shield is also reduced by up to 40 percent

Zircotec is providing best in class solutions to OEMs, ranging from high performance vehicles through to off-highway, AgriTech and commercial vehicles.

ZircoFlex SHIELD is the output of many years of development. Extensive real-world testing has been carried out on the engine of a four-cylinder British Touring car (350+bhp, 2L turbo) with many different exhaust pipes fitted with several of the industry leading insulation materials looking at varying levels of insulation.

The research and development program examined both detachable and integral heat

shields at different engine speeds and loads, and simulated typical under-hood temperature conditions. The key area of interest was at high rpm and full load where heat flux is the highest. Exhaust gas temperatures (from 660 to 730°C) were measured entering and exiting the exhaust pipe, along with surface temperatures (from 116 to 695°C).

Measurements have shown conclusively that ZircoFlex SHIELD has significantly better thermal performance at a 40 percent lower weight and 46 percent lower volume. This will therefore enable engines to run more efficiently and the cars to travel significantly faster. It perfectly balances the requirements of thermal performance against weight and space.

Graeme Barette, sales director of Zircotec, says: "If you can retain more heat within the exhaust gases of a turbocharged engine; if you can shield the driver from heat while the engine idles in traffic jams; and if you can lower the temperature under the bonnet at a given engine speed, you are seriously increasing race performance and efficiency of on-road cars and off-highway commercial vehicles, such as in AgriTech. That's what ZircoFlex SHIELD delivers.

"Thermal protection is particularly important in electric vehicles, where batteries are very dependent on their environment. It is well documented that high and low temperatures can reduce the battery life expectancy and journey distance before re-charging is needed.

"This extended life and keeping more of the heat within the car has obvious environmental benefits, as well as driver comfort."

The development of ZircoFlex SHIELD is the result of years of investment in R&D, averaging £1m per year, culminating in a £2.5m investment into much larger premises and new equipment last year.

Zircotec is an expert in plasma-spray processing and thermal barrier solutions and develop and produce industry leading high-performance surface coatings and finishes. They work with most F1 teams and other leading OEMs, high-end supercar manufacturers and motorsport organisations incorporate its heat shielding.

The company has a strong presence in



their existing specialist markets, namely automotive and motorsport, though they are now demonstrating the opportunities for sectors which to date has not been possible due to limitations in capacity. Industries such as the electric vehicle sector, oil and gas, marine, power generation and aerospace all present excellent opportunities. These industries have stringent emissions targets and heat management requirements and Zircotec's technology can provide a solution to manage heat, without adding excessive weight; key characteristics highly sought in these industries.

Zircotec offer a range of industry coatings with different performance characteristics, ideal for many different applications. This includes the plasma applied ceramic coatings, a flexible heat shield material, carbon composite coatings, anti-wear coatings and ceramic fabrications as well as heat shielding solutions.

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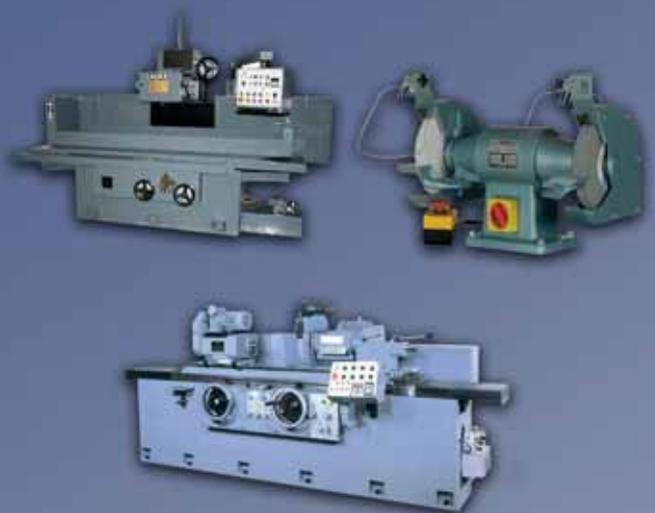


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