GRINDING & SURFACE FINISHING

**SEPTEMBER 2021**

EMO MILANO
4.–9.10.2021
HALL 3,
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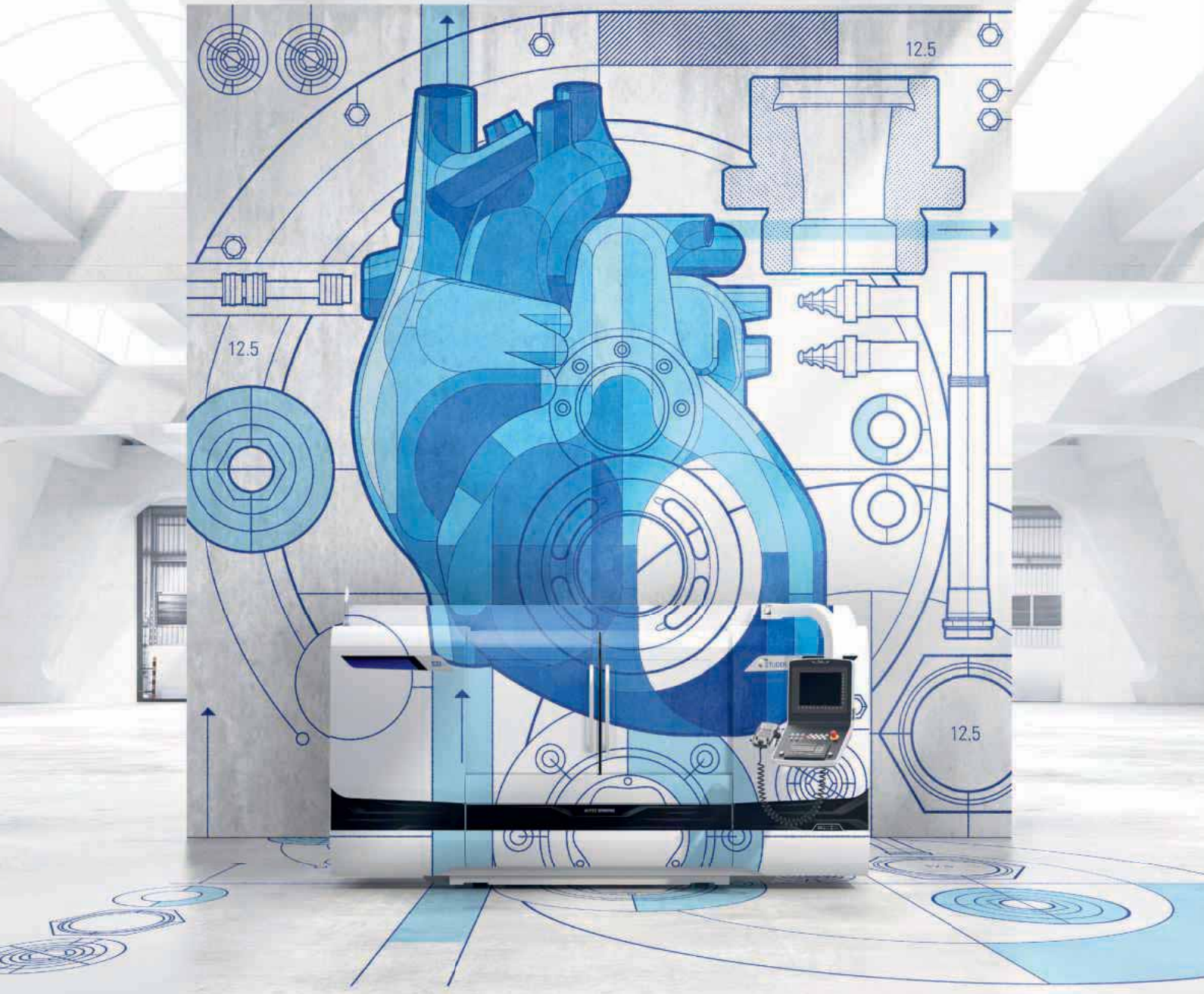


STUDER

The Art of Grinding.

A member of the UNITED GRINDING Group

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WORLD PREMIERE

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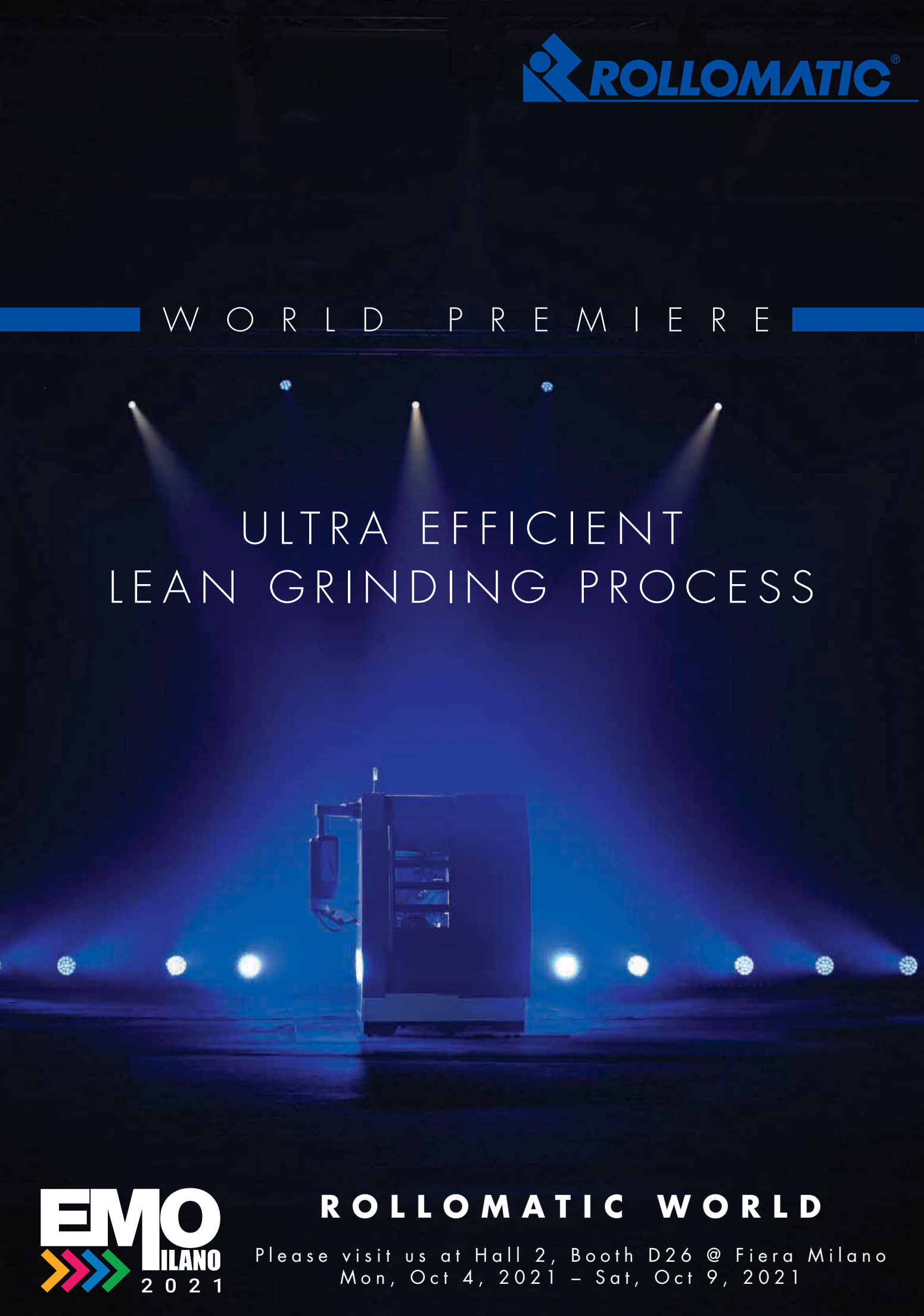

EMO MILANO 2021

## ROLLOMATIC WORLD

Please visit us at Hall 2, Booth D26 @ Fiera Milano
Mon, Oct 4, 2021 – Sat, Oct 9, 2021

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- Blast Cleaning
- Component Cleaning
- Deburring
- Dust & Fume Extraction
- Honing & Bore Finishing





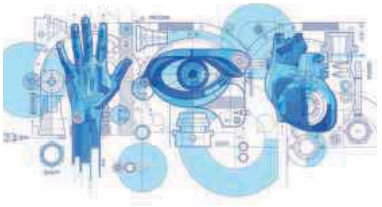
# The Art of Grinding

With its image campaign, STUDER is focusing on its motto "The Art of Grinding" and talking about what the company does best: The art of grinding

STUDER focus on its strengths. But where do these strengths lie? "We have unparalleled knowledge in and around grinding," says Sandro Bottazzo, STUDER's CSO. "Grinding is more than just machining. You have to master all the parameters. If you are in control of all those, then you have mastered "The Art of Grinding". Nothing says more about us than our company motto. That's why STUDER is refocusing on this motto. Grinding is an art, which not everyone can master with this degree of precision and quality," explains the CSO.

**Precision – Quality – Passion**

The Swiss artist Ata Bozaci designed the imagery for the campaign "The Art of Grinding." His implementation of the key visuals for STUDER's fundamental values is very striking: the eye stands for precision, the hand for quality and the heart for passion.



The three key visuals at a glance

Fritz Studer AG, established in 1912, produces standard machines and individual system solutions for high precision cylindrical grinding of small to medium-sized workpieces. The customers belong mostly to the machine tool, tool & die, automotive, aerospace, pneumatic/hydraulics, electronics, medical and watch industries.

As a market and technology leader with more than 24.000 machines delivered worldwide for universal, external, internal as well as form grinding applications, STUDER stands for quality, precision and passion over the past decades. In addition, STUDER also provides Software and Hardware solutions as well as a wide range of pre- and after sales services.

At EMO Milano **Hall 3 Stand E31** an S31 STUDER machine will show the eye of the STUDER image campaign. Together with the whole UNITED GRINDING Group, the revolutionary innovation C.O.R.E. will be presented on the first day of the exhibition.

Stephan Nell, CEO of the UNITED GRINDING Group, is only willing to reveal this much: "We have invested unwaveringly in research and development both before and during the Coronavirus pandemic, to secure the future, not just for us, but above all for our customers. When we talk about the future, it is inseparably linked to digitisation and with an increasing work simplification in production." The brand name says it all: C.O.R.E.: Customer Oriented Revolution. If you can't make the show, experience our world innovation via a live stream under the link **www.grinding.ch/emo-2021**

**Fritz Studer AG Tel: 0041 33 439 1111**
**Email: info@studer.com www.studer.ag**

EMO MILANO 2021 fieramilano 4-9 October HALL 3 STAND E31

# UNITED GRINDING presents a world premiere at EMO 2021

Under the brand C.O.R.E. (Customer Oriented Revolution), the UNITED GRINDING Group will unveil a revolutionary new product at EMO 2021 on the first day of the trade show at 12 noon, in **Hall 3**, **Stand E31**.

The UNITED GRINDING Group, a manufacturer of precision machines for grinding, eroding, lasering, measuring, and combination machining, is presenting a revolutionary innovation at EMO 2021 in Milan: UNITED GRINDING C.O.R.E. Each of the Group's brands, i.e. MÄGERLE, BLOHM, JUNG, STUDER, SCHAUDT, MIKROSA, WALTER, EWAG and IRPD, will be on hand to see the innovation presented to the public on the first day of the trade fair (October 4, 2021 at noon local time).


**A milestone in development**

No details about C.O.R.E. are being divulged ahead of the official market launch. Stephan Nell, CEO of the UNITED GRINDING Group, is only willing to reveal this much: "We have invested unwaveringly in research and development, both before and during the coronavirus pandemic, to secure the future, not just for us but above all for our customers. When we talk about the future, it is inseparably linked to digitalisation today and with an increasing work simplification in production."

**Stephan Nell, CEO of the UNITED GRINDING Group**

In this connection, C.O.R.E. is intended to put the focus back on people, and in a truly revolutionary way. The brand name says it all: C.O.R.E. (Customer Oriented Revolution).

**Inter-Group project**

Experts from each of the Group's three technology areas: surface and profile grinding, cylindrical grinding, and tool machining, worked within a joint team on this groundbreaking development. "This project reflects our bundled development expertise," explains Christoph Plüss, CTO of the UNITED GRINDING Group. "Through C.O.R.E., we are laying the foundations for a new generation of machine tools to pave the way into the digital age."

The result is a world-first that encompasses all of the Group's brands and machine types.

**Presentation at EMO 2021 in Milan**

Regarding the presentation of C.O.R.E. at EMO 2021, Stephan Nell confirms: "There will be an unveiling show on the first day of the trade fair at noon. It's best to reserve this date today." A live stream will also be offered for all those who can't experience the event in person at the trade fair. More details will be published on the company's website at **www.grinding.ch/emo-2021**.

UNITED GRINDING Group is one of the world's leading manufacturers of precision machines for grinding, eroding, laser, measuring and combination machining. With around 2,500 employees at more than 20 production, service and sales sites, the Group is organised in a customer-oriented and efficient way. With its brands MÄGERLE, BLOHM, JUNG, STUDER, SCHAUDT, MIKROSA, WALTER and EWAG, as well as competence centres in the USA and Asia, UNITED GRINDING offers an ample range of application expertise, an extensive product portfolio and an array of services for surface and profile grinding, cylindrical grinding and tool machining. In addition, a competence centre for additive manufacturing is operated under the IRPD brand.

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E31

C.O.R.E.

# CUSTOMER ORIENTED REVOLUTION

**EMO**
HALL 3
STAND E31

Find out more about C.O.R.E.:
**October 4th, 2021, 12:00**
**at EMO in Milan.**
Or via livestream at

grinding.ch/emo-2021

UNITED GRINDING

MÄGERLE | BLOHM | JUNG | STUDER | SCHAUDT | MIKROSA | WALTER | EWAG

# VOLLMER set to introduce new innovations at EMO

At the EMO 2021 exhibition in Milan, sharpening specialist VOLLMER will be presenting its sharpening machines and digital solutions for efficient and networked machining of cutting tools, no matter whether they're tipped with carbide or PCD (polycrystalline diamond).

From 4th to 9th October, Biberach-based VOLLMER will be introducing a raft of new technologies. One of the highlights on show at EMO will be the new VHybrid 260 grinding and erosion machine as well as the VLaser 370 laser machine, which will make its first live appearance at EMO due to Coronavirus restrictions. There will also be a world premiere in the form of the new VGrind 360S tool grinding machine.

Visitors to stand **E18/F13** in **Hall 2** will be able to gain insights into the latest VOLLMER portfolio of sharpening machines and services. This will include all the latest information on its wide range of grinding, erosion and laser machines for machining milling cutters, drill bits, reamers, circular saws and band saws. No matter what the process, the full-line supplier always has the ideal sharpening solution for sharpening tools tipped with carbide or PCD, as well as incorporating automation for unmanned production around the clock.


**VGrind 360S - the latest addition to the range**

The newest model of VOLLMER grinding machines is the VGrind 360S. This new machine can be used productively to machine carbide tools with a diameter up to 25.4 mm and, depending on the machine kinematics and the tipping of the grinding wheel packages, it can even be used for tools up to 150 mm diameter. Incorporating wear-free linear induction motors on all three axes will lower maintenance costs for the machine while demonstrating higher surface quality for the tool.

The tried and tested double-spindle concept features an oriented spindle stop for the first time. This always stops the spindle at a specific position. This function is also known as spindle indexing. This reduces axial run-out errors and concentricity errors even further and offsets wear in the HSK holding system. Another new feature is a heat plate exchanger to efficiently cool motors and spindles, which in turn leads to increased thermal stability. The VGrind 360S incorporates VOLLMER's trusted operating concept and can be operated unmanned around the clock thanks to automation features such as pallet magazine, free-arm robot and chain magazine.

**Premiere of the VLaser 370**

Restrictions permitting, the VOLLMER VLaser 370 machine will have its live exhibition premiere in Milan. The VLaser 370 uses the power of a non-contact laser to sharpen the cutting edges of cutting tools made of PCD or other ultra-hard materials. At the core of the machine is its fixed laser beam guidance with precision machine kinematics. How the five axes are arranged means that the tool is always machined at the pivot point of the C-axis. This makes it possible to sharpen tools with minimal axis movement to ensure stable process control.

**Precision grinding and eroding with the VHybrid 260**

Also on show at EMO will be the VHybrid 260 grinding and erosion machine. This machine will enable tool manufacturers to grind and erode a wide range of carbide and PCD tools in one combined setup. The VHybrid 260 combines technologies and experience that VOLLMER has gained in the fields of grinding and eroding over many decades. The key component for the eroding process is the VPulse EDM erosion generator, which optimises efficiency and surface quality. For grinding operations, the VHybrid 260 features the tried-and-tested machine concept of the VGrind series.

**Comprehensive service package**

The trade fair will also be attended by the VOLLMER Service division. The team will present offers for maintenance, servicing, training, financing and digitalisation. This will include digital solutions from VOLLMER's V@dison initiative, such as the 'Performance Pack for VHybrid 260' V@boost solution or the 'Visual Support' V@guide solution that enables customers to connect with VOLLMER technicians in real-time.

"At EMO in Milan, we finally have the chance to meet and speak with our customers in person again and show them the latest innovations from VOLLMER," says Jürgen Hauger, CEO of the VOLLMER Group. "Under the umbrella term of 'Networking', our focus is not only on personal contact but also on the digital connection between sharpening machines and online maintenance services such as our online seminars."

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**www.vollmer-group.com**

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# DONE-IN-ONE COMPLETE MEASUREMENT AN AWARD-WINNING INNOVATION

## KLINGELNBERG receives the German Innovation Award 2021

KLINGELNBERG

GERMAN INNOVATION AWARD '21 WINNER


❶ GD&T dimensional measurements ❷ GD&T form and position measurements
❸ Roughness measurements inside ❹ Roughness measurements outside ❺ Contour measurements

The precision requirements for components and assemblies are steadily on the rise. To meet these demands, as many measurement tasks as possible should be combined into a single sequence – ideally directly on the shop floor rather than in the measuring room. A Klingelnberg Precision Measuring Center (G variant) has rapid measurement capability for dimensions, shape, contour and surface roughness in one automated cycle, on one machine, which can be set up directly in the production environment. By combining measurement tasks traditionally performed on up to four different devices, it is possible not only to lower investment costs, but also to reduce setup times and quality costs.

# Gear solutions for e-mobility

**Mastering challenges together with the customer**

New drive technologies in electric mobility are changing the requirements for gears and therefore also for of the quality of the tooth flank surfaces. Manufacturers of gears have to adapt their manufacturing process accordingly. It's good to be able to rely on a technology partner with expertise covering the entire range of production processes and technologies, which enables them to find suitable solutions even for special challenges.

E-mobility is changing the entire drivetrain in cars, which also changes the demands made of gear components. One of the most important topics is the reduction of noise emissions from the drivetrain while driving. In order to minimise installation space, many parts of the gearbox are manufactured using a lightweight or compact design. At the same time, gear components must become increasingly robust and long-lasting in order to withstand the considerable stress caused by the higher engine RPM.

**Process and technology expertise from Liebherr**

This results in high quality demands on the tooth flank surfaces, which in turn brings about growing demands on the gear cutting process. Liebherr-Verzahntechnik GmbH has addressed this issue and refined and optimised various technological solutions for e-gearboxes. "We know about the challenges that manufacturers and suppliers must master in terms of quality and process reliability", explains Dr Andreas Mehr, who is responsible for the technology applications of gear grinding and shaping.

"We apply our expertise both in the process depth and in the range of technologies. This means that we can advise and assist customers comprehensively in order to find the optimal solution for them and their application."

On the process side, generating grinding with dressing-free CBN grinding worms, for example, ensures a high degree of process reliability. During the hard gear finishing, the gears can be precision-ground and polished, which further improves the surface roughness. Tools with small outside diameters machine collision-critical gears with limited tool overrun.

Methods for tooth lead modification are available for the tooth flank topology. For example, topologically error-free grinding with targeted end relief (GER) optimises the load-bearing capacity. In order to reduce noise emissions, a targeted waviness can be applied to the tooth flank (Noise Excitation Optimisation), or the diagonal amount during finishing can be increased in order to distribute the ghost line structure stochastically (Silent Shift Grinding).

The more topological modifications are necessary, the more it pays off to think about the tool material: CBN tools can be an economical alternative here. For many applications, grinding with corundum grinding worms is a good solution which, however, reaches its limits when grinding with high topological demands because of the dressing effort required. Dressing-free CBN grinding worms from Liebherr's own production offer a number of advantages: high process reliability due to the long tool life, the avoidance of error sources during dressing, easy tool handling, and considerably reduced measurement and testing effort. For a topology with GER modification, for example, CBN grinding performs much better than corundum grinding with regard to the unit costs. Extremely fine surfaces with an Rz roughness factor of under three micrometres can also be achieved in this way.

The challenge when producing gear parts for e-bikes is often in the intricate measurements and small modules. To manufacture these components in a high quality, the grinding process and clamping technology must be fast and extremely precise. Special clamping solutions ensure that even small and collision-critical components, such as drive shafts with a module of 0.6 mm in a gear quality of DIN 1-4, can be machined without difficulty.

**Machine concept: economic efficiency and reproducibility**

The exclusive Liebherr machine concept provides optimal concentricity and the highest possible reproducibility with a one-table solution. For the controlled and continual manufacturing of parts with quality requirements in the micrometre range, this is a technologically indispensable advantage. Particularly for smaller and medium batch sizes, which frequently occur in manufacturing for e-mobility, this concept is also particularly economical, since the short setup times enable a fast production start.

"We see ourselves not only as product providers but as partners and solution providers," Dr Andreas Mehr emphasises. "We take the customer with us on the journey by offering advice and pointing out plausible alternatives so that he can finally make the decision that is best for him."

**Liebherr-Verzahntechnik GmbH**
**Tel: 0049 831 3285**
**www.liebherr.com**

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# ANCA at EMO 2021

As well as the winner of ANCA Tool of the Year revealed live at EMO and the tailored GCX skiving cutter machine to service the booming electric vehicle market, the Melbourne-based machine tool manufacturer will also launch AutoMarkX, an automated laser marking system.

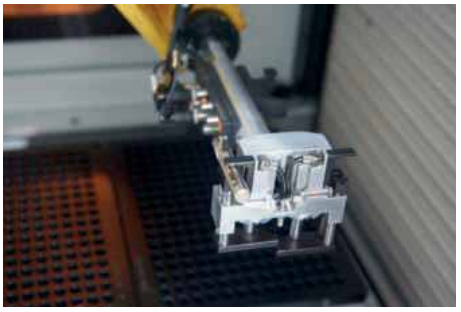
As the cutting tool industry moves towards more complex geometries and away from standard tools, manufacturers are needing to find new solutions. Often referenced as special tools, ANCA will showcase the technology, software and automation at EMO Milano that enable customers to design and grind multiple tool types in one batch, making special tools a more profitable strategy.

Meanwhile, from a CNC tool and cutter supplier's point of view, Electric Vehicles (EV's) growth in the market is a challenge as well as a revolutionary opportunity. In 2017, 11.8 percent of cutting tool consumption was for automotive manufacturing. However, the rise of EVs and the associated manufacturing changes will significantly impact this. The machining time required for pure EVs will reduce by 50–75 percent compared with traditional internal combustion engines (ICEs). This will result in a decline in overall cutting tool consumption as ICE vehicles' production declines.

Driven by EV's unparalleled 28-36 percent growth rate, the skiving cutters used in the high-speed skiving processes are in high demand. Due to their complex geometries, producing solid carbide skiving cutters requires a series of technology and process developments that enable their consistent and repeatable production. ANCA will bring its **GCX Linear** machine to EMO so customers can understand how it provides a complete solution for manufacturing DIN AA quality solid carbide skiving cutters. The GCX Linear sets the new benchmark for skiving cutter production. Adapted from ANCA's proven top-of-the-range CNC grinder platform, the GCX Linear adds tailored features to finish all operations for skiving cutters and shaper cutters in a single setup. With industry-first in-process profile measurement and direct path compensation, ANCA provides a practical closed-loop production solution.

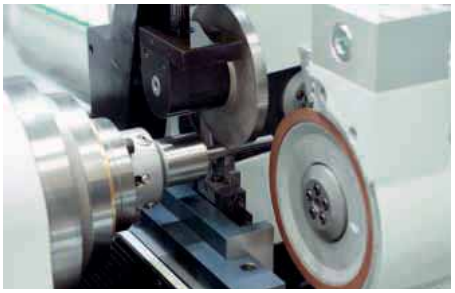
Visit ANCA in **Hall 2** - **Stand F10 G09** to get a demo.

**AutoMarkX**



AutoMarkX is an automatic stand-alone laser marking station replacing manual and labour-intensive process. It is AIMS compatible which means it can work in a fully automatic mode without a need for human intervention, if required. The operator can load pallets full of tools and walk away to take care of more productive and value adding tasks. The unit can accommodate a wide range of tool sizes, making it a versatile proposition for many manufacturers. The attractive return on investment (ROI) makes it a logical choice for your tool making businesses.

**CPX Linear**



Capable of achieving a surface finish better than 0.2 µm (0.000008 in) RA with run-out of less than 2 µm, this 4-axis grinder for creating tool blanks complements ANCA's full machine range. The CPX Linear has a large working envelope and powerful grinding spindles, achieving the highest precision and productivity for blank preparation in the market today. Using the PinchPeel method of grinding it offers the same strength, rigidity and thermal stability expected from an ANCA tool grinder.

**FX7 Linear**

For customers that require increased flexibility or more spindle power, or the increased automation capacity that a robot can provide, the FX7 Linear offers these.


The FX7 Linear offers a wide range of options for those looking to increase productivity and accuracy. Available is an optional 6-station wheel changer for automatic loading of wheel packs and coolant manifolds, and also robot loader options with capacity to load up to 840 tools.

**ANCA Tool of the Year**


ANCA's industry first competition is back with the 2021 winner to be announced live at EMO. Last year the industry welcomed the opportunity to show off their skills with almost 30 entries received from across the globe being seen by over 80,000 fans generating over 200,000 engagements on social media.

The competition offers global recognition and generous prizes, celebrating the magic of the cutting tool and the experts who create them.

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# Haas focuses on grinding details

Haas Schleifmaschinen has come up with something very special for the first international meeting of the metalworking industry in 2021. The specialist for turnkey solutions from Trossingen will be demonstrating high-tech grinding at its most precise at the EMO in Milan.

Haas Schleifmaschinen has innovative complete machining solutions for cutting and forming tools, as well as the machining of extruder shafts and, of course, its software solutions. After all, it is the software that makes the universal grinding machines from the Multigrind® series true specialists, with which virtually all grinding challenges can be tackled economically.

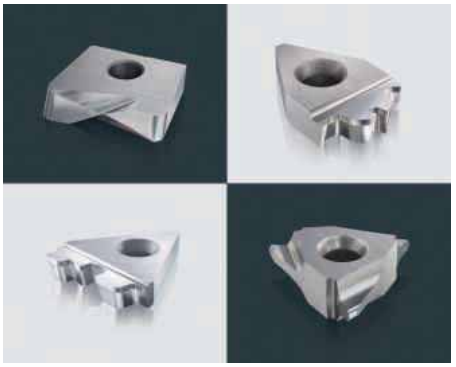
**Cutting tools: one solution for an infinite number of possibilities**

With the Multigrind CU on display and the Multigrind Horizon software, customers of Haas Schleifmaschinen are able to easily define, simulate and apply a wide variety of contour and clearance angle constellations, for example on grooving plates. The constantly changing geometry of the diamond grinding wheels in such manufacturing solutions is no longer an obstacle, because the 5-axis Multigrind grinding machine can be moved so precisely with the help of the control software that continuous peak values in dimensional accuracy are realized. Any inaccuracy due to grinding wheel wear is fully compensated for by the software. In this way, valuable time can be saved through significantly less dressing.

**Forming tools: more economical production with maximum precision**

Anything goes: contour production, square grinding, runout interpolation, alignment surface, tip radius and chamfer grinding, even complex forming tools, can be machined in just one setup with the familiar Haas precision. They have to be, because forming tools are expensive, often made of PM high-performance steel or carbide, one-off pieces. Grinding is therefore already the first choice today, as customer requirements in terms of complexity, dimensional accuracy and reproducibility have risen and continue to rise.

In addition, production must also be significantly more economical, and it is precisely here that software solutions play a decisive role. This is because Multigrind Horizon offers maximum flexibility, endless possibilities and the achievement of absolute precision in the production of forming tools. For example, different punches can be processed chaotically in one job. The jobs can be read in programmed via a web store and processed entirely in the spirit of Industry 4.0. Thanks to individual combination and parameterisation, exactly the forming tool that is needed at the moment, faster and more precisely than ever before, can be produced. It is irrelevant how often a grinding process is repeated, the result always remains within the tolerance range. Even when general conditions change, for example due to temperature fluctuations, because software, workpiece and machine are in constant dialogue with each other, deviations in the abrasive are brought back into shape in good time. The "closed loop process" enables maximum precision in series production up to batch size 1.



**Extruder shafts: demanding in terms of geometry and material design**

On the Multigrind CB on show at EMO, Haas Schleifmaschinen uses the example of an extruder shaft to demonstrate that modern grinding processes often pay off several times over, not only in terms of machining times, but also in terms of tool costs. These are comparatively low for grinding operations. However, the fact that complex workpieces can be produced completely on one machine predestines the Multigrind machine as a real alternative. This is because such workpieces are often produced on several different machines, which is associated with a higher expenditure of time in terms of setup and the actual machining. The reason for such complex production layouts can be seen in the demanding material designs, the different materials and the alloys. The fact that Haas Schleifmaschinen is the specialist for such turnkey solutions is demonstrated by its many years of expertise in the machining of Inconel and sapphire glass, as well as carbide and special alloys.

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# Advanced Grinding Solutions at EMO

As always, a number of the machine tool manufacturers represented in the UK and in Eire by Advanced Grinding Solutions Ltd of Coventry will be present at the forthcoming EMO exhibition in Milan.

Rollomatic, in **Hall 2 Stand D26**, is using EMO to launch a new machine model that will receive its worldwide debut. As one of the best known, most successful, and highly respected manufacturers of multi-axis CNC tool grinding machines, Rollomatic offers the machine of choice for the production grinding of rotary cutting tools of all kinds and for non-round tools such as punches. Rollomatic GrindSmart® machines excel at producing cutting tools of up to 20 mm in diameter and the superior Swiss-manufactured quality of every machine is demonstrated with industry leading three year unlimited hours parts and labour warranty that comes as standard on all new Rollomatic machines. GrindSmart machines are available with a 6th CNC axis to ensure perfect cutting tool geometry because the contact point of the grinding wheel remains constant over the entire grinding path during production. The latest linear motor technology provides more benefits such as enhanced surface finishes and reduced maintenance costs.

Rollomatic's ShapeSmart® machines are ideally suited for the high performance cylindrical infeed grinding of cutting tool blanks such as drills, form tools, reamers, end mills, and punches. The ShapeSmart NP30 variant offers tool concentricity after grinding of within 0.002 mm. These machines use a unique grinding process developed by Rollomatic known as "Pinch and Peel Grinding" for the production of cutting tool blanks or punches with diameters from 0.025 mm up to 25 mm and lengths of up to 330 mm.

More rotary cutting tools are produced in the UK and in Eire on Rollomatic machines than on any other and engineers are invited to see the very latest in production grinding on their stand that will feature software, clamping, and robotic loading solutions as well.

In **Hall 3 Stand E30**, TSCHUDIN AG is featuring its range of centreless grinding machines with the highlight being the latest TSCHUDIN CUBE 350 Centerless Grinder complete with a newly developed integrated collaborative robot. The compact CUBE 350 grinding machine, which won the Red Dot Design Award in 2020, impresses with its elegant appearance with the concept putting the operator at the center and offers improved ergonomics, efficiency and wide range of process options. The 3-axis CNC grinding machine has a small footprint and was specially developed for processing small workpieces with a diameter of up to 20 mm.

With its broad product portfolio of machines, TSCHUDIN covers a wide range of machined workpieces in centreless grinding: from the smallest wires for medical technology, whose shape can only be seen under a magnifying glass, to truck axles. The use of robotics ensures autonomous operation around the clock and flexible loading and unloading solutions with faster setup times ensure optimised efficiency is achieved.

TSCHUDIN machines benefit from several patented features that give them major advantages over any other machines in their class and today the Tschudin Cube machine is stated as being the world's easiest, simplest and fastest CNC centreless grinder to set up. A unique feature on all TSCHUDIN machines is the patented movable workrest axis (w-axis) which allows for additional grinding processes such as the highly efficient multi part grinding of several parts at a time or to split up grinding processes in the same grinding cycle to have both a rough and also a finish grind operation in one automatic setup. Thanks to the w-axis, the loading and unloading of the workpieces is always outside of the grinding zone, allowing simplified and safe automation or safe manual loading.

Comat, the Italian manufacturer of high quality filtration systems will be exhibiting its latest C-120 EVO filter unit on its stand in **Hall 2 Stand E31**. This advanced filtration system offers the absolute finest quality of filtration and is also very much designed to save energy. The systems are ideal for the filtration of any type of contaminant (carbide, HSS, medical steels, ceramics, and brass etc) and are now widely fitted to Rollomatic tool grinding machines as well as many others. Today, more than 20,000 machine tools use Comat's filtration technology worldwide with more than 120,000,000 litres of metalworking oil being super-filtered.

Through an in-depth analysis of each individual client's needs, Comat designs and

manufacture super-filtration systems that deliver ≤ 2-3 µm filtration quality throughout the entire working cycle thus maximising the quality of parts produced on machine tools while minimising lifetime running costs and maintaining maximum coolant consistency. Comat systems can be customised to meet a specific client's needs, allowing for maximum efficiency of the filtration process. Oil is filtered to a better quality than new unused oil on Comat systems. Cost studies have shown that Comat systems are considerably cheaper to run that other systems that use candles or a series of cartridge type filters whose running costs are up to four times greater.

Process optimisation (remote monitoring) to Industry 4.0 standards is included on the EVO models, with these being equipped with Comats "Intelligent Performance Technology." The filter's performance is self-adjusted based on the effective working-rate of the connected machine tool(s).Comat EVO filters can be monitored, controlled and optimised in real time from the onboard operator control or remotely via laptops, PCs, tablets and smart phones from anywhere in the world.

Platit in **Hall 4 Stand E02** is a leading manufacturer of highly advanced coating machines that are based on plasma generating PVD technology (Physical Vapour Deposition). From its headquarters near Solothurn in Switzerland, Platit operates on a global basis and has supplied more than 550 coating installations world-wide into no less than 38 different


countries. Platit offers complete turnkey solutions including all necessary peripheral equipment and technologies for surface pre-treatment: Platit coating machines work on the basis of the Conventional Cathodic ARC principle and the revolutionary LARC® (LAteral Rotating Cathodes) and CERC® (Central Rotating Cathodes) technologies. These technologies are patented and are unique and are widely used by major cutting tool manufacturers.

Having your own coating plant assures independence from external service providers. The coating knowledge remains in-house and importantly the production, grinding and coating can take place on the same day. Logistics are simplified and faster delivery times made possible. In-house production guarantees the fastest throughput, and damage caused by transport or packaging is prevented. The in-house process is also more environmentally friendly.

The coating quality is guaranteed and even the best external coating centre cannot deposit an optimal coating for all tools because amongst other reasons, it is not possible, for example, to produce an optimal coating thickness for all tools, because mixed batches in the usually large chambers contain different tools that would require different coating thicknesses. With your own turnkey system, different tools do not have to be coated together with a universal coating, but their specific applications are still considered. Integrated coating centres usually pay off in less than two years. Platit's wide and flexible range of coatings, with the possibility of developing your own coatings, guarantees a unique selling point for Platit end users.

GPA Innova, the manufacturer of Dlyte polishing machines, is in **Hall 3 Stand E34**. These revolutionary polishing machines benefit from utilising the world's first dry electro polishing process. The DLyte range of machines use a totally unique, single step automated process, for polishing metals.

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

The highlight at EMO will be the new DLyte Desktop machine. This is an ultra-compact system that gathers all the advantages of any other DLyte system currently on the market, and allows any company to access the dry electropolishing technology. It is accessible to small laboratories, workshops, workrooms and SMEs needing a cost-effective solution for metal surface finishing processes. From grinding to mirror finishing, this new setup offers a new easy way to process any casting, sintering or milled metal part.

Advanced Grinding Solutions will have staff present at the EMO to welcome customers from the UK and Eire. To pre-arrange a meeting on any of the booths, contact:

**Advanced Grinding Solutions Ltd**
**Tel: 024 76 226611**
**Email: sales@advancedgrindingsolutions.co.uk**
**www.advancedgrindingsolutions.co.uk**

EMO MILANO 2021 fieramilano 4-9 October

**Rollomatic - Hall 2/D26**
**Comat - Hall 2/E31**
**TSCHUDIN AG - Hall 3/E30**
**Platit - Hall 4/E02**

# Three leading brands in precision on show

## Danobat, Danobat-Overbeck and Hembrug all feature at EMO

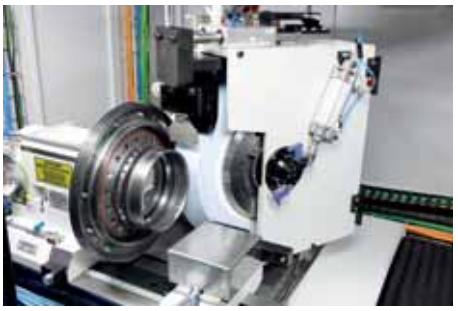
Machine tool and advanced production systems manufacturer Danobat will take part at the EMO trade fair in Milan, one of the biggest events on the international calendar for the industrial manufacturing sector. Danobat will showcase the most technological advanced solutions of its three brands: Danobat, Danobat-Overbeck and Hembrug.

These three brands develop technologically advanced solutions, which offer near 100 percent availability, tight accuracies in reduced cycle times, with the possibility of incorporating customised automated solutions to meet perfectly customers' most demanding production requirements.

Under the slogan "Driven By You", the company is to present latest generation grinding and hard turning machines with high technology value as well as fully automated solutions. Danobat will also be showcasing how it can improve customers' effectiveness with its digital services.

**CG: Welcome to the new age of high production grinding machines**

Danobat will present the new generation of grinders: the CG external cylindrical grinding solution. These machines can apply conventional abrasives at wheel speeds of 80 m/s, using standard equipment. This boosts productivity up to 20 percent in many applications. The CG also boasts



nearly 100 percent availability, thanks to smart engineering that reduces component count, remote diagnostics, predictive maintenance and Danobat's deep experience in producing machines for high volume production. What's more, the CG's unusual cross-slide design and swiveling B-axis wheelhead make it capable of grinding a wide variety of part sizes and geometries in a compact space.

**ILD: Flexibility that guarantees operations in one cycle**

Danobat-Overbeck, the German subsidiary, presents the ILD high-precision internal, external & radius grinding machine, a flexible solution capable of grinding highly complex parts which require different grinding processes in one setup. During EMO, the ILD machine will be showing a demo part manufactured especially for this fair with no less than 30 eccentric holes.

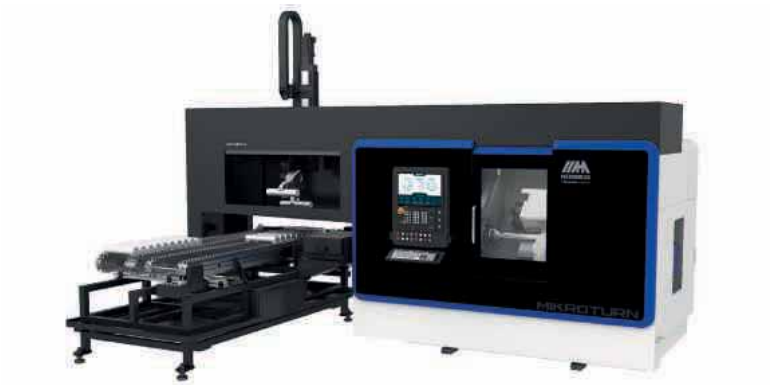
In addition to being suitable for grinding of deeper and longer ID´s, the machine allows for clamping of parts of up to 1,300 mm with a swing of 760 mm in diameter. The configuration options of the B0 axis (+20°/-10° or +90°/-15°) makes it an effective solution for the production of precision parts requiring complex operations. It can grind tapered surfaces and allows automated cylindrical corrections. It is also possible to grind radii using interpolation. This in turn allows complex geometries to be machined in the part using coordinate grinding. It is even possible to make square, rectangular or free shapes with the highest level of precision.

**New generation Mikroturn®: Hembrug has upgraded the most accurate finish hard turning machine**

Hembrug Machine Tools will present the new generation Mikroturn finish hard turning machine with integrated gantry loader. The new generation Mikroturn is a further development of the existing Mikroturn 100 and features a complete new and modern design. It also incorporates many improvements in the field of thermal stability, machine stiffness and accuracies that have been implemented in the Mikroturn 100 in recent years. In addition, by applying the latest generation of pumps and motors, noise levels have been reduced by more than 70 percent.

Hembrug started working with Danobat on the new design after its acquisition by Danobat in 2019. The modern and functional design is now in line with the Danobat style. The machine can also easily be equipped with Danobat´s in-house developed gantry loader. This ensures even greater productivity and efficiency with lower per-part costs, even in a high-mix and low-volume environment for which the new generation Mikroturn will mainly be used. The new design, where the hydraulic unit and gantry loader are integrated into the machine body, has a smaller footprint than the current Mikroturn 100.

Under the hood, the new generation Mikroturn still offers the highest finish hard turning precision levels on the market just as the Mikroturn 100. Form and dimensional accuracies of less than 2 micron and surface roughness Ra of 0.1 to 0.4 micron in



workpieces with hardness of up to 70 HRC are indicative for the precision level of the new generation machine.

Thanks to the wear free, hydrostatic bearing system, this machining accuracy is maintained even after decades of use. The Hembrug Mikroturn machines are used worldwide already for many years by renowned companies in the bearing industry, tool and mould making and machine construction. The new generation Mikroturn is the next logical step in order to meet an ever increasing demand for productivity, accuracy and lower cost per workpiece.

Danobat is an industrial company

specialising in the manufacture of machine tools, solutions for the manufacture of high value-added components, turnkey production systems and technologically advanced services for demanding sectors like automotive, aerospace, railway and power generation, among others. Internationalisation is an important hallmark and t boasts production plants and service centres in Spain, Germany, The Netherlands, Italy, UK and the USA, as well as an important sales and service network which covers 40 countries.

Danobat, which belongs to the MONDRAGON Corporation, has a 65 year track record in the development of high precision grinding and turning machines and invests between 8 and 10 percent of its income in innovation. One of the leading machine tool producers in Europe, it employs some 600 people and records an annual turnover of around €130 million, of which more than 90 percent comes from international markets.

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**www.danobat.com**

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## Quality is at the heart of Tecnologie FRB


Since the early 1960's, Tecnologie FRB has been designing, building, and marketing live centres and face drivers for turning, gear cutting, and grinding. By the 1980's, it was already recognised as the leading company in this sector. Quality is at the heart of Tecnologie FRB, starting from the initial concept, through the continuous improvement of products, services, design, and manufacturing. It also works with customers to provide products and services, offering complete solutions to manufacturers and OEMs.

At its plant in Bologna, Italy, highly qualified staff have a modern,technologically advanced system at their disposal to produce FRB Live Centres, from the original series 80 and 85 to the latest 2000, 2006 & 2008 series, facilitating different axial loads from classic turning and gear cutting to the most demanding of external grinding and gear cutting production. FRB face drivers are also produced with the highest quality as they are able to satisfy the classic need of a spring-loaded centre to the most advanced fixed centre systems.

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# The AZ-Aerospace solutions for all internal grinding processes

**by Claudio Tacchella**

The Italian company AZ SpA of Thiene (VI) has been designing and manufacturing special large cylindrical grinding machines for more than 40 years. Among the numerous sectors to which it addresses, it excels in the aerospace one to the point of being recognized today among the few references appreciated all over the world by the primary industries of aircraft, direct and indirect EOM and RMO.

"Our long experience in the aeronautical sector - says Sarah Pizzolato, marketing director of AZ SpA -, has allowed us to create a modular and customizable range of constantly updated grinding solutions called "AZ-Aerospace", designed specifically for production and maintenance of aircraft components. Our AZ grinding machines are all customizable, energy efficient, safe, reliable and comply with Industry 4.0 requirements."

Among the numerous high-precision grinding solutions of AZ SpA, the new GSB range have recently been renewed and made even more flexible and performing.

The GSB line is modularly designed and is developed in numerous models which differ in size, technical characteristics, configurations and customizations.

It is particularly appreciated in the aerospace sector for the grinding of internal diameters, including deep ones, grinding of faces, chamfers, tapers profiles and spherical grinding. All this makes it possible to work with maximum flexibility most of the technical issues of components such as transmission shafts, gas turbines shafts, stators, flanges, aircraft landing gears, etc.

**In the AZ-Aerospace line, the GSB range is particularly appreciated in the aerospace sector for the grinding of internal diameters, including deep ones, grinding of faces, chamfers, tapers profiles and spherical grinding**

The dynamics of the machine is developed on a base designed with FEM analysis and made of stabilized cast iron or, according to the models, in Composital (a special material composed of resine-granite and steel) which guarantee exceptional absorption of vibrations, great machine rigidity, stiffness and high dynamic performance.

The base is constantly wet by coolant which further contributes to maintaining the constant temperature of the system to improve the final geometric results of very high precision in grinding.

The GSB line is fully enclosed and accessible in total safety and ergonomics. From the front of the machine, three operational areas can be distinguished. On the right side, the wheelhead operates on the main axes of work, Z-longitudinal and X-transverse, which are arranged superimposed and crossed.

Their movement takes place through recirculating sphere screws on very high-precision linear guides controlled by pressurized optical lines. The grinding wheelhead designed with a rigid structure is available in different configurations and allows you to mount up to three spindles to perform sequential operations on a single piece setup with great flexibility.

For example, spindles with powers from 2 to 22 kW can be mounted on the GSB600 model. The wheelhead can be fixed or rotating manually or automatically with

**The GSB line allows it to be configured for high precision grinding of very deep holes**

B-axis operated by an integrated torque motor.

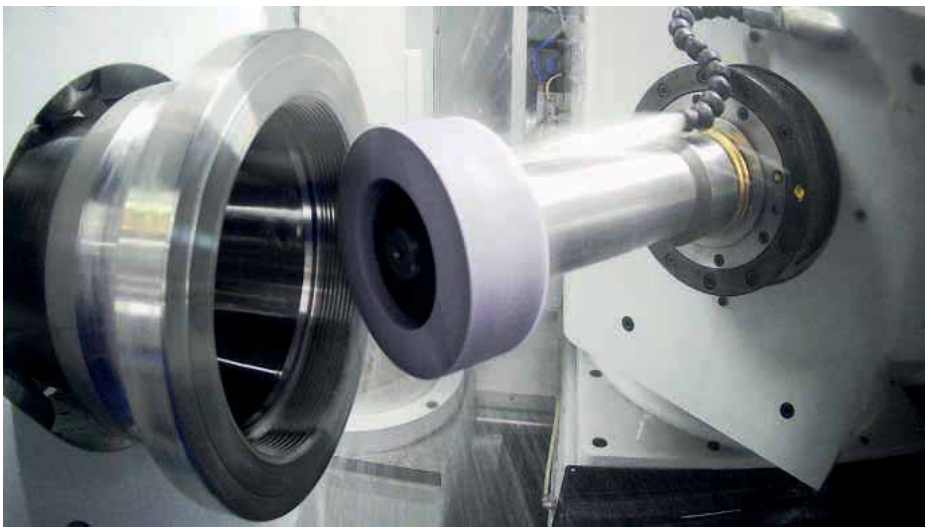
Silicon carbide, corundum, CBN and diamond grinding wheels can be used which allow to grind all aerospace materials, metals and their alloys including chromium and in particular those subjected to the most innovative systems for thermal spray techniques, such us H.V.O.F. (High Velocity Oxygen Fuel).

On the left area, the headstock is arranged on a special table that allows its orientation, manual or automatic by U-axis, in a max range of -30°/+ 30° depending on the models, to perform adjustment processes on chamfer or on interior taper.

The headstock, equipped with C-axis, is designed to use different clamping systems such as 3-4 self-centered, manual or automatic chucks, membrane chucks or in accordance with the specific workpiece.

On the GSB600 model the headstock motor power is 2.3 up to 3 kW for a speed range from 0 to 1,000 rpm. It has the possibility of centering the piece by the Morse or ASA cone and can move along the table by CNC-controlled W-axis to facilitate the positioning of the workpiece. For long workpieces there are several support systems with 3-point steady rest, which can be positioned on the table manually or automatically.

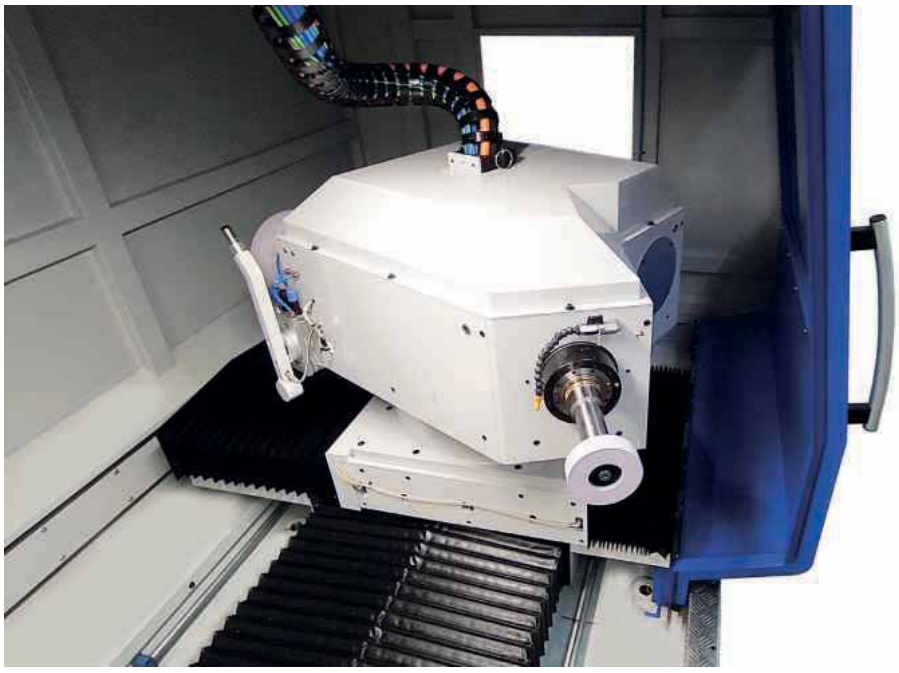
The last third area, but certainly not as importance, concerns the dressing of the wheels. Behind the headstock, special stands positioned at 45° is arranged on a rigid support for this fundamental operation. The turrets are driven by hydraulic circuit with diamond heads both at fixed points and by diamond disk.



**An example of a chamfers grinding performed on an aerospace flange with a sequential cycle in a single workpiece set-up**

"The grinding process, - explains Sarah Pizzolato -, has some functions to give to the operator few automatic and safe working cycle such us Electronically variable spindle speed, Hydrophone for detecting wheel/piece touch, GAP control, Dressing control, Probes for piece, wheels detections and their wear, CRASH control and in-process control of diameters with two-point from CNC. The GSB range allows a maximum internal grinding diameter up to 600 mm for workpiece length up to 3,000 mm."

**The headstock with C-axis is placed on a U-axis swivel table. Behind the headstock, special stands positioned at 45° is arranged on a rigid support for dressing of the wheels**



**The grinding wheelhead designed with a rigid structure is available in different configurations and allows you to mount up to three spindles for maximum flexibility**

The design creativity of AZ allows the creation of product lines, like the new GSB grinding machines, among the most sophisticated on the market today.

AZ SpA exhibits at the EMO international fair in Milan, October 4-9, at Hall 3, Stand G25 where AZ engineers are available to illustrate all the technical characteristics and provide all information on the new AZ-Aerospace range.

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**www.azspa.it**

# Boeing awards contract to Turkish Aerospace to manufacture Boeing 737 fan cowls

Turkish Aerospace (TUSAŞ) has been awarded a contract by Boeing for manufacturing and supplying Fan Cowls for Boeing 737, the legendary single aisle aircraft family. Turkish Aerospace will be responsible for 50 percent of the monthly 737 Fan Cowl requirements starting in 2025.

The agreement between Boeing and TUSAŞ expands the portfolio of Boeing Commercial Airplane products manufactured by TUSAŞ. The two companies' close industrial collaboration supports the 737 program's performance and affordability while furthering the longstanding relationship between Boeing and Turkey's aerospace industry.

Fan cowl doors provide an aerodynamic surface over the fan case of the engine between the inlet and the thrust reverser and protect engine mounted components and accessories. There are two fan cowl doors (left and right) around each engine that can be opened to provide access for service and maintenance of the engine components and accessories on the fan case of the engine.

Professor Temel Kotil, president and CEO, Turkish Aerospace, evaluates the agreement and says: "Our company continues to be among the manufacturers that have proven in the field of aerostructure with its half a century of experience. In this context, while we continue to produce national projects in the field of aviation industry in our country, we also carry out high-quality critical productions for the world's leading aerial platform manufacturers. We are delighted for the fan cowl production for Boeing as part of the agreement. We bring a new ability to our company. I congratulate all my colleagues and Boeing authorities who contributed to this cooperation."

Aysem Sargın, managing director, Boeing Turkey, says: "Turkey is one of Boeing's strategic growth countries and we see tremendous potential for the country to contribute to the global aerospace industry as an industrial and technology partner. With the launch of Boeing Turkey National Aerospace Industry (NAI) by Boeing and Turkey several years ago, Boeing has expanded its investments, footprint and supply chain in Turkey. The award of the 737 Fan Cowl work package to TUSAŞ is a reflection of our continued commitment to Turkey and the wo rld-class capability of our industrial partners in Turkey."


Fan cowls will be manufactured at the state-of-the-art TUSAŞ premises in Ankara,Turkey, where the company is already contracted from Boeing to manufacture the Boeing 787 Dreamliner elevator, cargo barrier, horizontal leading edge, and 737 elevator, along with the deliveries of thousands of parts/components that are flying in Boeing airplanes for years.

Turkish Aerospace is the centre of technology in design, development, manufacturing, integration of aerospace systems, modernisation and after sales support in Turkey. Located in Ankara, Turkish Aerospace production plant covers an area of four million square metres with an industrial facility of 640,000 square metres under its roof. The company has a modern aircraft facility furnished with high technology machinery and equipment that provide extensive manufacturing capabilities ranging from parts manufacturing to aircraft assembly, flight tests and delivery. For more information, visit **www.tusas.com**.

As a leading global aerospace company, Boeing develops, manufactures and services commercial airplanes, defence products and space systems for customers in more than 150 countries. As a top US exporter, the company leverages the talents of a global supplier base to advance economic opportunity, sustainability and community impact. Boeing's diverse team is committed to innovating for the future and living the company's core values of safety, quality and integrity. Learn more at **www.boeing.com**.

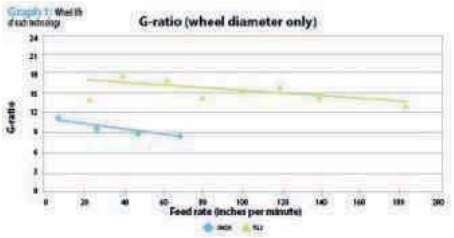
# Grinding versus machining in aerospace applications

## Advanced abrasive solutions can outperform traditional machining processes for operational savings, by David Graham, application engineer, Norton | Saint-Gobain

The aerospace industry is known for using materials that defy machining with conventional tools and processes. The properties of these materials, i.e. high-strength at high temperature that allows the components to survive in the hostile environment of an aerospace engine, are the same attributes that make them difficult to machine.

Whether the parts are cast, forged, or made from sintered powdered metal, most have 50 percent or more of their original volume removed before turning, milling, and broaching. Because of the properties of these materials and the high value of the parts, these operations are usually run at conservative feeds and speeds to ensure the tools don't fail or damage the part.

**Grinding vs. Machining - Graph 1**
Regardless of the parameters used in machining, part tolerances and surface quality degrade as the tool wears, which can reduce the component's life in the engine. In contrast, a grinding wheel is easily dressed, keeping the cutting edges of the abrasive sharp and the wheel shape constant, which in turn results in consistent finishes and close tolerances.




**Aerospace slotting**
An aerospace customer needed to cut slots into a disk of IN718 material and wanted to compare a milling process with grinding. The customer turned to engineers at Norton | Saint-Gobain Higgins Grinding Technology Centre, who conducted an evaluation with two abrasives: one with Norton Targa ceramic aluminia TG2 grain and the other Norton Quantum ceramic alumina 5NQX grain.

Two plates of IN718 were stacked and four 1/2" wide slots were ground 1/2" deep for each condition without dressing the

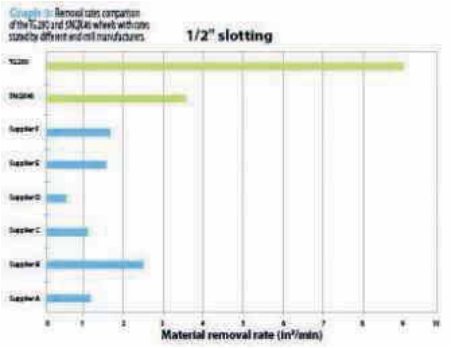
wheel. A depth of cut of 0.100" was arbitrarily selected and feed increased in increments of 20"/min until wheel wear was deemed too high. In the case of the 5NQX wheel, a feed rate of 70 ipm was reached before wheel wear was deemed too high, and for TG2 wheel, the feed was increased to 180 ipm. Graphs 1, 2, and 3 show the G-ratio (volume of material removed ÷ volume of wheel loss), energy to remove one ipm and a removal rate comparison by different end mills for the application.

**Grinding vs. machining - Graph 2**
Energy required to remove one $in^3$ per minute


**Aerospace turning**
Replacing a traditional process with grinding depends more on how the part and wheel contact each other than on geometry. Similar to the slotting case, another example uses wheel technology, replacing the turning operation with grinding.

Newer nickel alloys used in aerospace can be even more difficult to machine than legacy materials such as IN718. A customer was having difficulty with turning one of these new nickel alloy materials. Inclusions in the material were causing unpredictable tool failure and tool life was very low due to the high strength of the material. Using Norton Vitrium 3 bond along with the extruded TG2 grain, Norton engineers were again able to grind the part at a feed of 0.025" per part revolution and a work speed of 160 ipm, reaching a removal rate of 4.0 $in^3$/ipm. Under these conditions, 8.0 ipm were removed using a 2" wide wheel. With the tool change capabilities in today's machines, separate wheels can be used to reach and finish complex part geometries the same way as a traditional CNC lathe. If the surfaces require grinding after turning, then the turning operation can be eliminated.

**Grinding vs. Machining - Graph 3**
Removal rates comparison of the TG280 and 5NQX46 wheels with rates stated by different end mill manufacturers.




**Assumed milling parameters**
As the test results support, grinding proved to be the most effective, productive material removal process.

Cost savings on manufacturing processes can come from reduced capital expenditure, consumable tooling, logistics, or cycle-time reduction. Engineers can now identify opportunities where an abrasive solution will outperform traditional machining processes and using advanced abrasive products and documentation software can help identify and deliver savings to your operation.

If you'd like to know more about how these test results might apply to your application, contact:

**Saint-Gobain Abrasives**
**Tel: 01785 279569**
**www.nortonabrasives.com**

# Ghiringhelli's new A80 centerless grinding machine is born to celebrate the 100th anniversary

## by Claudio Tacchella

The 2021 is a very important year for the company Rettificatrici Ghiringhelli S.p.A., the world leader in the manufacturing of high tech and top quality centerless grinding machines headquartered in Luino (VA). The Italian company celebrates the centenary of the foundation and to honour this important anniversary it will present a world premiere at the next international **EMO** in **Milan (Hall 3 - Booth D12)** a new series of centerless grinding machines named **A80** (Anniversary). The new A80 will expand the range of the Ghiringhelli's solutions. It will represent in fact the smallest machine manufactured by the company suitable for the fixed centre (FC) grinding on very small components.

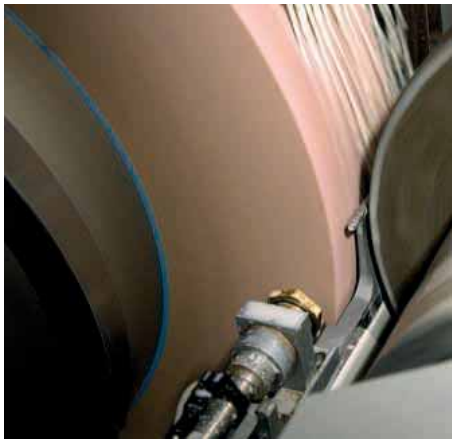
"The new **A80** series, - says Patrizia Ghiringhelli, Joint Managing Director of Rettificatrici Ghiringhelli -, completes the range of our centerless grinding machines and finds application in the field of watchmaking, micro mechanics, medical, electronics, electromechanics, automotive and aerospace industry. It is a flexible grinding machine, modularly designed and with rapid set-up, specific to the grinding of component in small batches."


**Partial view of a CAD rendering of the new A80 centerless grinding machine in design phase**

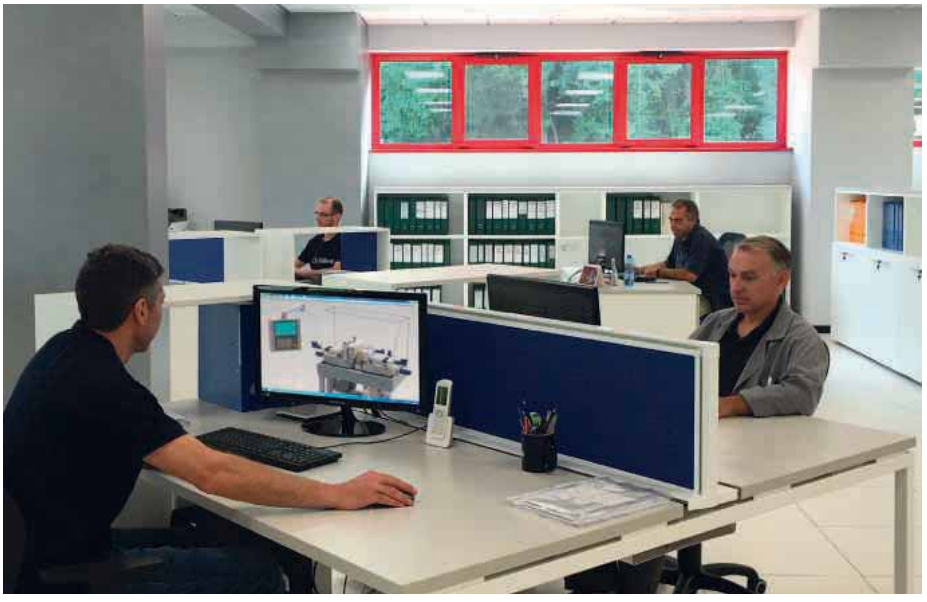
The new A80 is very compact and totally enclosed, and it has a new design that combines aesthetics, functionality, total safe accessibility, ergonomics, automation, and all integrated systems. It is provided with 6 CNC axes and a mineral casting frame in natural granite 100% recyclable, granting very good mass/rigidity ratio, excellent material absorption, heat inertia and perfect ecological balance.

The two main opposed working slides (V and Z axes) are driven by very accurate ball screw bearings class ISO3. The grinding wheel dressing occurs by diamond disk or diamond tool, mounted on crossed slides, and it is controlled by two CNC axes (X/Y) as well as the control wheel dressing (X1/Y1 axes) which occurs by diamond tool.

The grinding wheel head is equipped with a very high precision ball bearing spindle



**For 100 years Ghiringhelli has been designing and manufacturing centerless grinding machines equipped with advanced technological solutions, customized according to the specific production needs to be solved**



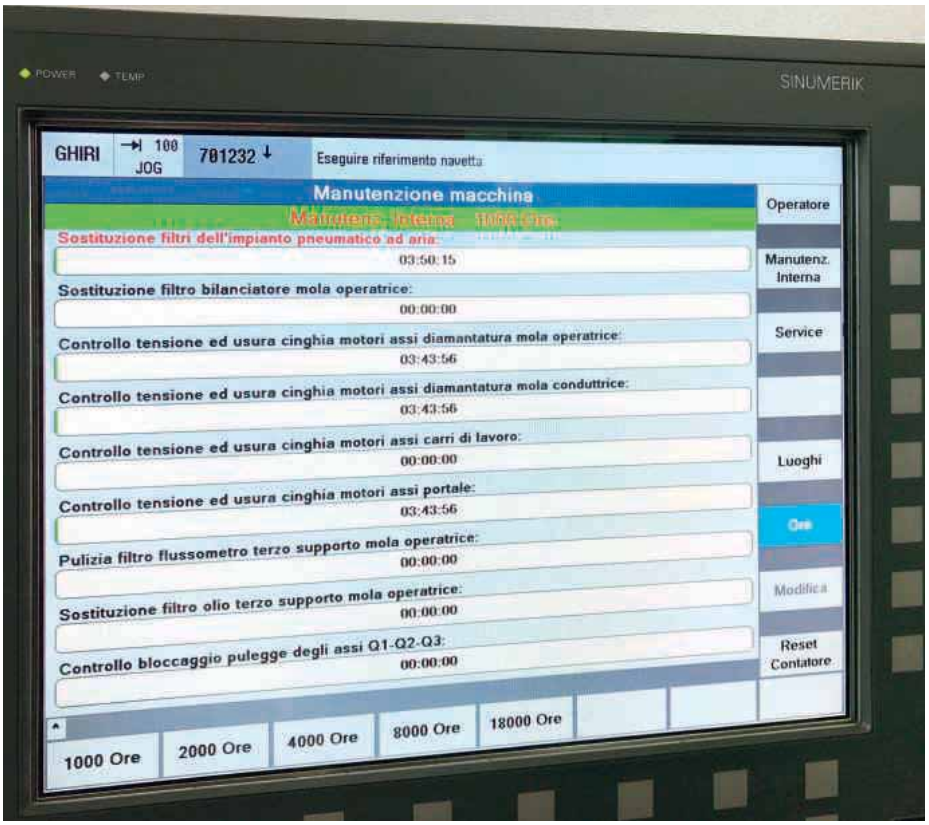
**Ghiringhelli has always been designing each centerless grinding machine by following strict rules of validation for each planned development phase**

driven by a 4 kW motor. It is suitable for grinding wheels of 200 mm Ø and width 80 mm, with constant peripheral speed of 50 m/s (option 63 m/s). The grinding wheel balancing is automatic through a balancing head fitted on a grinding wheel flange.

The control wheel head is mounted on the Z slide and can be tilted of ±5° granting a correct positioning of the parts against the stop of the working blade in plunge grinding operations, or the adjustment of the speed in throughfeed grinding operations.

The control wheel head is equipped with a very high precision ball bearing spindle driven with a third outrigger bearing, enabling the spindle stiffness. It is suitable for control wheels of 100 mm Ø and 80 mm width, and motor torque up to 1,15 Nm.

In this configuration the A80 can grind pieces from Ø 0,1 mm up to Ø 15 mm, and lengths up to 80 mm, in plunge grinding cycle or in throughfeed grinding cycle. This centerless grinding machine can be connected to the manufacturing processes




**The CNC integrates all software functions through the exclusive Ghiringhelli HMI platform, including the remote control, the telediagnosis, and the periodic preventive maintenance**

**The new A80 is a very flexible grinding machine, modularly designed and for a quick retooling, which can also be used for small series both for plunge and for throughfeed grinding**

according to the Industry 4.0 standards. The lights and all light signalling are realised with LED and all machine motors are of IE3 class.

The machine is equipped with a tilting and swivelling control panel, and complete with a 15" screen. The CNC Siemens 840D SL integrates the exclusive Ghiringhelli HMI characterized by diagnostics, wheel-profiles libraries, cycle programming, statistic calculations for dimension corrections during working cycle, remote control, teleservice and tele diagnostics, periodic preventive maintenance, and all safety functions in accordance with the Performance Level PL of the DIN EN ISO 13849-1 and the Safety Integrity Level SIL 2 of the DIN EN 61508.

The new A80 centerless grinding machine can be smartly integrated with the most popular data base manufacturing systems thanks to the open OPC UA protocol (developed by the OPC Foundation), extremely safe and tested.

The A80 machine can be supplied with a wide range of customized automatic systems for the loading and the unloading of the components, such as hopper bowl feeders, feeding conveyors, and gantry type loaders fixed on the machine bed side. In addition, according to the production needs, it can be completed with different equipment and attachments.

"We take the opportunity of this anniversary and the launch of the new A80 series to celebrate the old and the new – concludes Patrizia Ghiringhelli. We have always believed in values as the quality, the reliability, the innovation, and the sustainability, that are the basis of every action and decision we have taken in our company history. In our family as well as in our company we have always had a cohesive spirit of innovation. We constantly pay attention to the market trends and requirements. Since our origin we have been at our customers' disposal, listening to their needs and their suggestions, in order to provide them with the most suitable centerless grinding solutions, and to improve our "made in Italy" all over the World".

**Rettificatrici Ghiringhelli S.p.A.**
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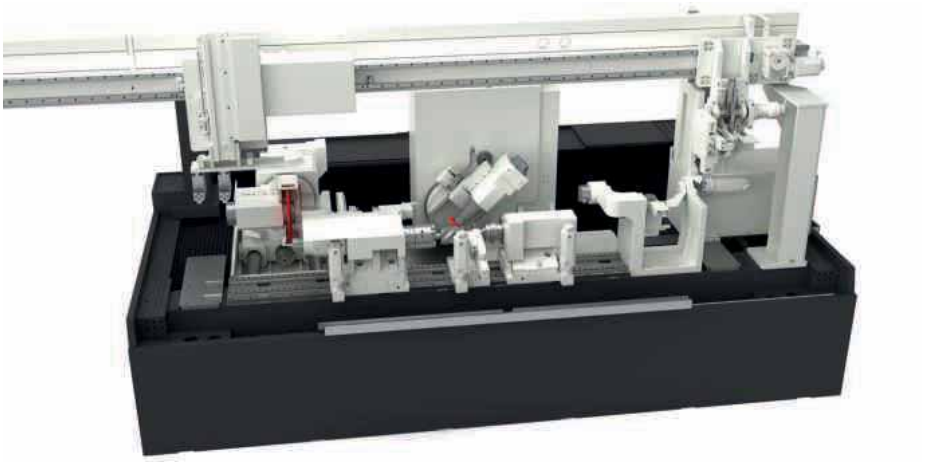
# JUMAT cylindrical grinding machine revolutionises the market

## JUNKER has developed a game changer for rotor shaft manufacturing

All in one grinding machine, JUNKER has developed new technologies that allow the complete grinding of screw compressor shafts in highest precision. The fully automatic grinder exceeded the customer expectations and revolutionises the grinding market.

As world market leader in grinding with CBN, JUNKER provides a new milestone in rotor shaft manufacturing. As a partner for precision, JUNKER simplified processes and developed a flexible and efficient grinding machine concept that provides highest quality with in process measuring of all critical dimensions including form scanning and automatic shape correction.



**JUNKER cylindrical grinding machines are based on revolutionary design principles and are equipped with state-of-the-art technology**

**Faster, efficient and with the highest quality**

Sullair LLC, located in Michigan City Indiana, a JUNKER customer since 2011 has changed its finishing process to eliminate the demand to pair shafts and achieve highest compressor efficiency. In the past, the process required multiple grinding machine setups to finish a shaft. Diameters and faces of the shaft were ground on the JUNKER QUICKPOINT prior to grinding the compressor flutes on form grinding machines.

Today with the JUMAT 6L all of this is done in one setup and one machine. In addition, for faster changeovers and to control process quality, the machine in process measuring systems measures key features and automatically adjust the process to produce the highest quality without operator intervention. JUNKER developed the capability to measure the complex compressor flute profile and correct the dressing path to dress the CBN wheels complete automatically.

**Cost-effective complete grinding with optimum accuracy**

The correction is essential as tool pressure varies depending on the contact zone of the shape. It is necessary to apply a wheel with an incorrect shape to make a perfect part. The JUNKER grinding machine masters this with ease and for optimum accuracy; the machine produces parts with a total lead variation of +/- 3 microns and a profile accuracy of less than six microns.

**JUNKER ensures productivity with intelligent processes**

For the different flute shapes and for rough and finish grinding, the machine is equipped with a wheel changer. The machine programs call up the correct wheels and manage their life span. If a wheel has reached the end of its life, the controller requests a new wheel and alerts the production manager to purchase a new one. The parts are presented to the machine on a conveyor with an autonomy of a full shift. Parts are loaded into the machine by an internal gantry system. The safety of the entire system is therefore safeguarded and grinding with straight oil possible.

**Economical, intelligent and highest dimensional precision**

JUNKER rotor shaft technology provides the capability to grind highest efficiency compressor shafts in one setup with controlled part quality by the grinding machine. The JUMAT from JUNKER is a game changer for the grinding market.

The JUNKER Group, headquartered in Nordrach, Germany is a world leader in the production of CBN high-speed grinding machines. Close to 1,300 employees worldwide maintain the company's technological edge. Renowned automotive companies and their suppliers as well as tool manufacturers and other industries trust JUNKER's innovative grinding concepts. Whether for mass or small series production, JUNKER grinding machines operate precisely, economically and reliably.

**Rotor machining: the flexible and efficient machine concepts result in top quality and highly productive machining**

Aside from Erwin JUNKER Maschinenfabrik GmbH, LTA Lufttechnik GmbH and ZEMA Zselics, Ltda. also belong to the JUNKER Group. LTA Lufttechnik GmbH manufactures air filtration and fire protection systems for trade and industry. ZEMA completes the group as a specialist for corundum grinding.

**Erwin Junker Maschinenfabrik GmbH**
**Tel: 0049 7838 84353**
**www.junker-group.com**

# There is much more of Ghiringhelli than you can imagine!

In many everyday products that you use, there is our small but significant contribution. We are talking about components, ground “within microns” by our centerless grinding machines. The Rettificatrici Ghiringhelli is aimed at the sectors of automotive, aerospace, motorcycle, electrical tools and tools wherever perfection is required.

GHIRINGHELLI
Centerless Solutions

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# Taylor Hobson grinding 'true to form' with Okamoto

Leicester-based Taylor Hobson is a globally renowned, ultra-precision technology company operating at the highest levels of accuracy within the field of surface and form metrology. As part of the Ultra Precision Technologies Division of AMETEK Inc. the business provides contact and non-contact measurement solutions for the most demanding of applications, Taylor Hobson's advanced grinding capabilities enables the manufacture of the company's components with industry leading surface finish, straightness and form standards. In addition, the business' skilled production staff have developed a range of techniques that push the boundaries of ultra-precision grinding. To support its activities, Taylor Hobson's grinding department boasts a wide range of cutting-edge grinding technologies sourced from some of the world's leading machine tool manufacturers. The latest hi-tech addition to the department is an innovative Okamoto 208 ACC-CHiQ double-column, surface and profile grinding machine.

Mark Bent, chief manufacturing engineer at Taylor Hobson, explains the reasons behind the recent purchase: "The knowledge and skill of our grinding staff and the resulting production of ultra-precision components has enabled a virtuous circle to develop.

"For example, Taylor Hobson's ultra-precision products are designed to measure components' surface finish and form characteristics. Therefore, our in-house knowledge of all aspects of surface finish and form has allowed our grinding department to develop procedures that enable the company's components to be ground with outstanding levels surface finish, straightness and form precision. In turn, our ability to grind to the highest of standards of precision helps the company to develop and manufacture ultra-precision metrology products that measure surface finish and form to the very highest standards.

"Ultra-precision grinding represents one of Taylor Hobson's strongest areas of expertise. We produce the reference datums for our measuring instruments with a combination of dimensional, geometrical, straightness, flatness, and surface finish control, that are amongst the very best in the world. The levels of surface grinding precision that we regard as relatively straightforward would challenge the vast majority of global businesses.

"As the straightness, flatness, and surface finish of the columns that we grind represent the foundations of the precision of Taylor Hobson's metrology products, we place severe demands on our grinding machines. Therefore, when a previously used surface and profile grinding machine began to show its age, we started a search for a large capacity, ultra-precision replacement.

"Having dismissed several options that lacked the required precision capabilities, we purchased an Okamoto ACC-CHiQ double-column machine from DF Precision Machinery Ltd. In order to achieve the required stability and ultra-precision performance, we installed our new Okamoto grinder on a substantial 0.8 m concrete foundation, with a further 14 piles that reached deep into the bedrock beneath the machine.

"Our challenging flatness value target across the entire working surface of the new machine was to reach a sub 2 µm figure. Following the machine's installation and the installation engineers' precise adjustments, we were delighted to achieve a flatness value of just 1.2 µm, a result that far exceeded our ambitious target.

"Our choice of machine, the solid foundations it was installed on, the fine-tuning of its working surface and the skill of our staff has resulted in our ability to achieve remarkable levels of grinding

flatness. For example, we now grind our 600 mm long columns to an impressive straightness value of 0.5 µm. In addition to the precision of the Okamoto ACC-CHiQ, the machine's impressive speed is also enabling us to achieve the production efficiency levels we aim for."

Used throughout the world in some of the most challenging of grinding situations, Okamoto's advanced ACC-CHiQ Series of double-column machines satisfy the demands for high accuracy grinding whilst also providing the production speeds required by today's manufacturers.

As the accuracy of a double-column grinding machine depends largely on the precision of its cross-rail, Okamoto has developed an ingenious cross-rail mechanism that enables minute mechanical adjustments to be made following a machine's installation. The company's fine-tuning correction system allows extremely high degrees of flatness and straightness to be achieved along machines' entire working surfaces without the need for NC corrections to be made.

Okamoto's ACC-CHiQ series machines boast 22 kW spindle motors that deliver the maximum horsepower in this class of machine. Complementing the advanced ACC-CHiQ series precision grinding capabilities, the machines boast a number of features that provide impressive levels of production efficiencies. For example, dressing times have been shortened by combining upper dressing for rough dressing with tabletop dressing for finishing. Also, the machine's shift-plunge grinding cycles make a significant contribution to reducing processing times.

The use of feature rich, yet easy-to-use iQ software via the large colour touch screen FANUC control, makes the processing of large workpieces grinding a straightforward process. The smart software considerably simplifies data input and reducing cycle time. Data is automatically generated by inputting the grinding wheel's grain size, total machining allowance and precision machining allowance. Then, by inputing the grinding wheel size the optimum grinding wheel condition is automatically created based on grinding process theory. Data input can be achieved using only two screens, whilst panel buttons cover the full range of surface grinding and grinding operations.

Traditionally grinding processes largely relied on operator's skill and intuition. To provide maximum assistance, Okamoto has developed a function for automatically setting the recommended process conditions based on grinding process theory and Okamoto's in-house knowledge. iQ software supports the use of both Alundum-type grinding wheels and ultra-abrasive-coating grinding wheels. Users are also able to input their own condition settings. The software graphicly displays the position at which grinding is to be performed on screen. The cycle end time is also displayed, further saving setup time.

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# Supertec chooses NUM technology

Supertec Machinery Inc., one of Taiwan's leading machine tool manufacturers, has chosen to base new versions of its renowned Plunge type of CNC cylindrical grinding machines on NUM's Flexium+ CNC platform.

Founded in 1954, Supertec Machinery Inc. has grown to become one of Taiwan's top machine tool manufacturers. The company specialises in precision grinding automation and produces a diverse range of centreless, cylindrical and surface grinding machines. Based in Taichung City, Supertec operates sales and support facilities at strategic locations throughout Asia and Europe, as well as in the USA and South America.

Supertec has traditionally used FANUC CNC systems for most of its machine tools. However, when NUM added non-circular grinding functionality to its popular NUMgrind cylindrical grinding software back in June 2020, the company realised that this innovative CNC technology provided exactly what many of its customers needed on their cylindrical grinders.

NUMgrind simplifies the creation of G code programs for CNC grinding machines through the use of a highly intuitive graphical human machine interface (HMI), and unlike conventional CAD/CAM workstation tools, it is designed specifically for use by shop floor personnel in a production environment.

After evaluating the software, Supertec immediately raised a purchase contract with NUM. According to Betty Chu, Supertec's assistant general manager, "NUM has an excellent reputation in the grinding industry. Much like Supertec, this has been earned over many years. The latest version of NUMgrind, which accommodates non-circular grinding, is a natural fit for our CNC cylindrical grinding machines. We also now benefit from very responsive local support, as NUM's Taiwan facility is less than 15 km away from our factory."

Supertec's plunge type of CNC cylindrical grinding machines offer a choice of six capacities, covering distances between centres from 500 mm to 2,000 mm. The machines can also accommodate grinding diameters from 300 up to 430 mm (3 sizes),

grinding wheel speeds up to 1,390 rpm and workhead spindle speeds from 30 to 350 rpm. The new versions of these machines are based on NUM's Flexium+ 8 CNC platform and use NUM's high performance MDLUX drives and brushless servo motors for the X, Z and C axes. In addition to the NUMgrind HMI, the software that is being supplied by NUM includes the Flexium 3D simulator, which can be used offline or online, and an application-specific profile editor which enables users to import DXF files.

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# New development from Hardinge / Kellenberger

## Z2-axis for automatic length compensation with automated parts feed

Grinding specialist Kellenberger, part of the Hardinge Group, has developed a groundbreaking innovation for a tool manufacturer that greatly simplifies the automation of grinding workpieces of different lengths.

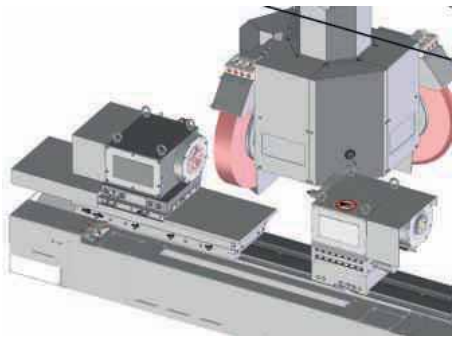
For a long time now, users have been interested not only in machines, but in machining solutions. When it comes to machining solutions, the machine manufacturer is responsible for the entire process, including all upstream and downstream operations. The steady advance of automation in production processes also challenges the flexibility of machine tools.

In the Hardinge competence center in Studen, Switzerland, the focus is on customer-specific systems solutions. There, highly integrated cylindrical grinding systems for large-scale production are equipped with automatic loading, measuring devices and other additional operations as the case requires. Every year, a wide variety of turnkey solutions are delivered to customers, including automobile manufacturers and other suppliers.

At the Kellenberg production site in St. Gallen, the "Customer-Specific Special Constructions" department develops solutions that are particularly challenging and are not yet available on the market.

A well-known tool manufacturer was searching for a solution for the automated grinding of workpieces such as drills and tool holders. The challenge in machining is that the parts have different lengths. This means that the clamping force must be changed manually for the necessary length compensation during grinding. Automated machining is out of the question here.

**Z2-axis sample application assembly**



**The newly developed Z2-axis for automatic length compensation**

The designers in St. Gallen met the challenge and rose above the competition. They developed a positioning axis (Z2 axis), that ensures automatic length compensation by a robot or gantry loader during the fully automatic loading.

The Z2 axis is mounted on the Z-axis and moves there. The automatic zero point shift is done using a longitudinal pushbutton (KEL-Pos). Dressing is not possible on the Z2 axis. The grinding dressers are mounted on the Z-axis. Workpieces with a diameter of up to 250 mm and length compensation from 50 mm to 300 mm can be machined. Non-circular parts can also be ground. These can be centred fully automatically.

Important technical information:

Hub 250 mm
Centre height min. 250 mm
Axial force max. 1200 N
Load capacity for live spindle grinding 100 Nm (max. 80 kg)
Positioning speed 10 m/min
Load capacity between the tips max.150 kg

When using a synchronous tailstock (available as an optional feature), no chuck is required because of the friction drive. An in-process measuring control covers a diameter range of 25 mm. Manual retooling is no longer necessary.

The Z2 axis was developed for the universal internal and external cylindrical grinding machines of the K100 and K1000 series with FANUC control. The obvious question is: Can the Z2 axis be retrofitted on such machines? Patrick Gähler, design engineer at Kellenberger answers in the negative. "Retrofitting is not possible because the function of the Z2 axis must be incorporated in the design of the machine beforehand."

Since June, in the showroom at Kellenberger in St. Gallen, interested customers are able to see a K100 with Z2 axis, on which tests can also be carried out.

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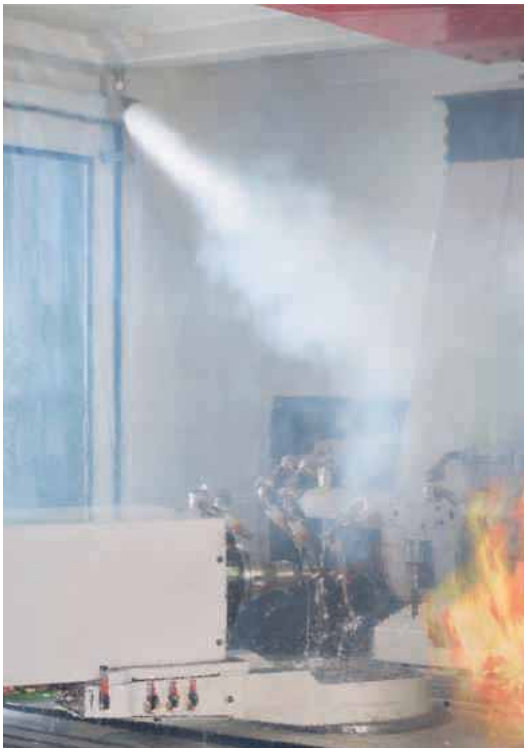
# Protect your grinding machines with Kraft & Bauer

Kraft & Bauer supplies major machine tool manufacturers and distributors with fire protection systems and also offers a full retrofit and service support facility for its UK and Irish customers from its base in Coventry, with the same day availability of all parts being guaranteed. It also offers a same day/next day swap system for discharged $CO_2$ and Argon gas bottles.

The company is reporting a growth in sales as manufacturing companies are becoming much more adverse to risk and are looking to safeguard their production machinery in the knowledge that a loss of a machine would seriously hamper their ability to produce parts for their customers and that the cost of replacing machinery is extremely large.

The need to protect grinding machines remains the most important application due to the risk of a spark and it can only take a slight change in the direction or volume of coolant supply, or for a small programming error, for excess heat to be produced that can easily ignite the misty vapour that is ever present during the grinding process. Kraft & Bauer fire systems are fitted to all makes of grinding machines including Rollomatic, Tschudin, Walter, Vollmer, Studer and many more,

Low-viscosity neat oils rather than soluble ones are increasingly being used to achieve a more efficient and economic grinding process and this trend brings the topic of fire and explosion protection and prevention for machine tools to the fore. The reaction following an ignition of the oil/air mixture that can occur within the interior of the machine tool, which if violent and followed by a fire can be the cause of accidents with severe material and fire damage. Besides injuries to operators, the consequences to engineering companies can be high due to losses because of production stoppages. Many engineering companies think that insurance is sufficient, but don't take into account that it may take many months before factories and machines may be replaced and their customers might not be prepared to wait and would instead go and find alternative suppliers whilst they were still trying to recover from a fire incident. Without the mandatory annual service certificate being in place and available of being produced to an insurance company, it is unlikely that any insurance policy would, in any case, cover for any claim.



It must be respected that if any machine uses oil, and/or has a capacity to generate a spark, or is machining a potentially combustible material such as a titanium or magnesium alloy, then it represents a major fire risk. The machine manufacturer takes this information into account when analysing the risk for the identification and specification of the protection concept for the machine; usually by means of fitting an automatic fire extinguishing system and explosion flap device. The end user has responsibilities to ensure that the fire protection systems are serviced, usually at least annually, by a responsible validated service technician.


For the protection of grinding and other machine tools, Kraft & Bauer automatic fire suppressant systems using an extinguishing agent, commonly carbon dioxide or in case of machining titanium or magnesium argon gas, are employed. To ensure that a fire is detected as early as possible and that the fire extinguishing system is activated without delay, optical fire detection units, either Infra-Red that's best suited for grinding applications or Ultra-Violet light are fitted that react in just a few seconds to any incident.

Mandatory annual servicing of the fire systems are needed and have the purpose of the timely detection and repair of damage as well as ensuring safe operation and the annual proof of service certificates are also required by insurance companies. Machine tools must be tested for fire safety prior to initial commissioning when new, recurrently thereafter in accordance with the suppliers maintenance specifications (at least annually) and after any maintenance work which may affect safety. The service record of the annual fire detection system test should ideally be stored over the whole operational lifetime of the fire suppressant system/machine.

Additional information on fire detection and extinguishing systems for machine tools is available from:

**Kraft & Bauer UK Ltd**
**Tel: 024 76 229477**
**Email: sales@kraftandbauer.co.uk**
**www.kraftandbauer.co.uk**

# Dresser Contact Control

The full capacity of gear grinding machines flexibility can only be used when the dressing process for profiling the grinding wheel is highly precise. Highly economic grinding requires a high removal rate and therefore a significant wear of the grinding wheel with the risk of non-proper profiling. This dilemma can be eliminated with KLINGELNBERG's Dresser Contact Control. Two conflicting targets are brought together: highest precision of the grinding wheels profile and most profitable dressing process parameters.

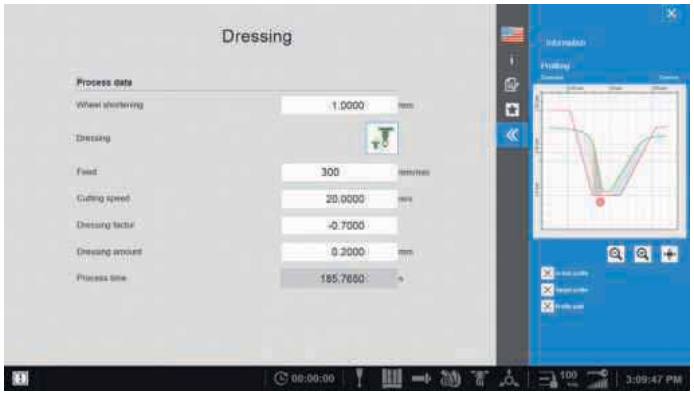



**Fig. 1: Dressing parameters and view of dressing roll and target profile of grinding wheel**

For gear grinding machines, profiling of the grinding wheel is an essential function. This so called dressing operation removes the worn out surface and applies the correct profile on the grinding wheel. This is done using a diamond coated dressing tool. The machine performs movements of the dressing tool and the grinding wheel to achieve the proper profile.

**The dressing process**

When grinding bevel gears, a cup shaded grinding wheel is used. The dressing tool is diamond coated disc with a radius on the outside diameter. Profiling the grinding wheel is done with the outside of the dressing tool.

Each dressing operation reduces the length of the grinding wheel by the so called dressing amount. The geometry of the profile on the outside and inside will not change along the service life of the grinding wheel. The dressing amount must be big enough to guarantee a proper profile after the dressing cycle.

This is the problem: in the case of a dressing amount being too small, you do not get the proper profile on the grinding wheel. If the dressing amount is too big, the dressing tool will wear out unduly and the service life of the grinding wheel decreases.

**Challenges in bevel gear grinding**

At a first glance this problem does not seem to be complicated. When looking more detailed to this task the challenge is the typical

Fig. 2: Dressing tool and grinding wheel

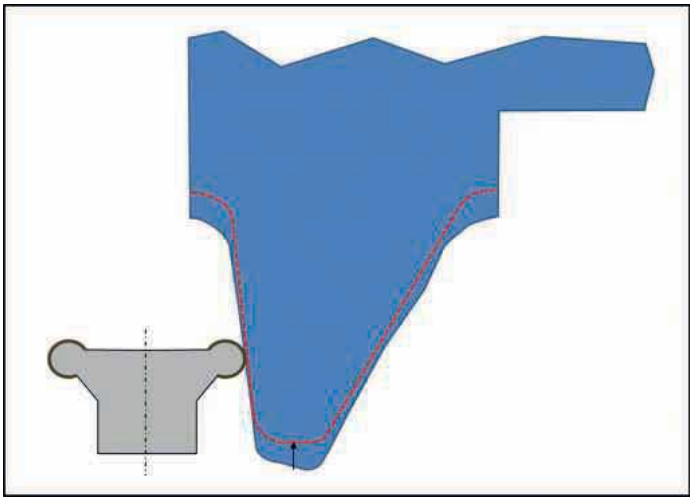


Fig. 3: Typical dressing wheel profile before and after dressing

shape of a grinding wheel for bevel gears. Since the lengthwise crowning requires tilting of the grinding wheel the flank angle of the outside profile is significantly smaller than that of the inside. Consequently the removal on the outside is drastically smaller than the removal on the inside.

Experienced operators set the dressing amount such that a reasonably big removal is guaranteed on the outside of the grinding wheel. Typical flank angles of 10° outside and 30° outside and a dressing amount of 0.1 mm create a removal of only 0.017 mm on the outside and 0.058 mm on the inside of the grinding wheel. This dressing amount will only guarantee a safe grinding process as long as the wear on the grinding wheel is significantly less than 0.017 mm. In case this cannot be ensured, the dressing amount must be increase for example up to 0.15 mm. This is on the safe side but the service life of the grinding wheel will be reduced by more than 30 percent at the same time.

This is the starting point of KLINGELNBERG Innovation called Dresser Contact Control. All bevel gear grinding machines of the G-Series now have an acoustic emission sensor integrated in the dressing spindle. During the dressing operation this sensor checks if there is really contact in between dressing tool and grinding wheel. This can be seen in real time display on the controller by a blue bar along the dressing path. In case the contact tears off the machine software will repeat the dressing operation.

In collaboration of the acoustic emission sensor and the KOPG software there are many advantages:

• The profile of the grinding wheel is always correct independent from the dressing amount.

• The dressing amount can be reduced to a reasonable minimum. In case a gear was ground having a large material allowance of having large heat distortions both causing a excessive wear of the grinding wheel the next dressing cycle will be repeated as long until the proper profile on the grinding wheel is guaranteed.

• When profiling a new grinding wheel the sequence of dressing operations will be stopped as soon as the proper profile is shaped on the grinding wheel.

With the new Dresser Contact Control feature not just the process reliability of bevel gear grinding is improved but also cost reduction is guaranteed: instead of applying a dressing amount of 0.1 mm this can be reduced down to 0.8 mm. The effect is a reduction of up to 20 percent in the pro rata tool costs.

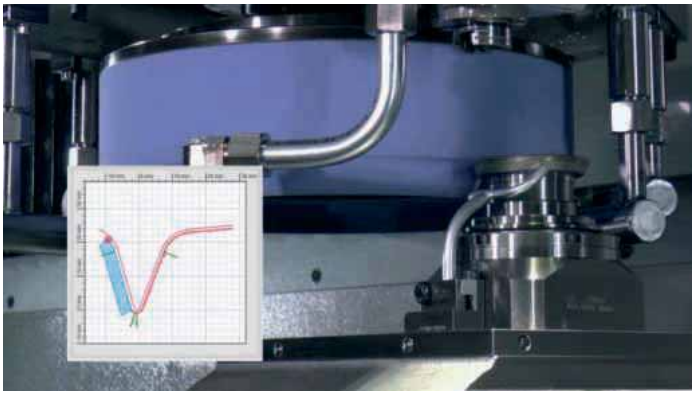


Fig. 4: View into working chamber and real-time display on the operator panel

At a glance:

• Process stability requires a perfect profile on the grinding wheel, whereas economic grinding demands for high stock removal.

• In the past this was compromised with a high dressing amount to guarantee profile accuracy.

• DCC allows increasing tool life and tool costs by guaranteeing highest profile accuracy.

**KLINGELNBERG GmbH**
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# Productivity increase through avoidance of errors

Efficiency requirements for manual processes continue to rise: harmonisation of a few operating parameters leads to tapping of unused productivity reserves when working with tungsten carbide burrs.

"In metalworking, many process steps are still carried out manually or must be done manually," says Thomas Plömacher, product manager PFERD Tools, the specialist for work on surfaces and cutting. The aim is not only technically perfect execution. Instead, in ever more cases the work must be carried out with as much economic efficiency as possible. "Avoidable errors that make efficiency impossible from the very beginning are often made," explains the specialist for tungsten carbide burrs. Reporting on numerous cases he experienced in past years, he says: "Strictly speaking, productivity depends on only a few criteria that must be well harmonised with each other when it comes to the use of tungsten carbide burrs.

"Undoubtedly, the most important decision involves selecting the right tool. It must be suitable for use on the material to be processed and its form must suit the processing requirements. Its drive must have an appropriate design and power and, last but not least, operating parameters such as rotational speed, contact pressure, and working speed must match the application. We see that in practice, errors are often made in that area. Luckily, parameters are easy to change."

Thomas Plömacher uses one of the most frequent applications for tungsten carbide burrs to explain the 'cases': "Take metal cutting on steel as an application with the aims of high stock removal, a good surface and low production costs. Typically, conventional cross-cut burrs are selected here, although some cut types are optimised for the material. If the processing progress is unsatisfactory, as a rule the rotational speed is increased. The thermal load on the tool and workpiece stock removal both increase with rotational speed, but stock removal usually does not. Sparks fly and at some point, the burr is ruined. If a high-performance burr had been used, that wouldn't have happened. These tools have different cut geometries that are designed for higher stock removal and they can also be used at rotational speeds that are around 25 percent higher."

Alongside high-performance, material-specific cuts, the universal high-performance Allround burrs are high-performance burrs. "With them, I have a cut that I can use on the most important material and it delivers performance similar to that of a material-specific high-performance burr."

A comparison with conventional cross-cut tungsten carbide burrs shows that in use on steel, the result is stock removal that is up to 30 percent higher. "Also, because the burr can be used at a significantly higher rotational speed, it also enables smoother running and increased comfort."

In summary, Thomas Plömacher says: "When you are selecting a tool, make sure you decide in favour of a burr that is ideally suited to and specifically designed for the task at hand and not just any burr that can be used on the material to be cut. Also, make sure that the operating parameters are harmonised with the application. When these errors are avoided, nothing more stands in the way of economic efficiency and tapping of productivity reserves. To accomplish those things, you don't have to be a specialist."

PFERD is a leader in the development, production and support, as well as in the distribution, of tool solutions for work on surfaces and material cutting. In keeping with a tradition that dates back more than 200 years, PFERD operates as an independent, internationally oriented, family-owned company geared towards the long term.

PFERD tools offer the user maximum benefit and optimum cost-effectiveness. Its unlimited commitment to premium quality, its reliability as a supplier and its responsible use of resources all make PFERD a dependable and reliable trading partner that operates with sustainability in mind.

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**www.pferd.com**

# The Tyrolit Group: Leading technology, inspiring life

TYROLIT unites the strengths of a family run company with a high level of technology expertise and many years of experience in the production of leading-edge grinding solutions. The Group offers tailored grinding solutions and a comprehensive assortment of standard tools for customers around the world. With the ever-increasing demands of industry and the resulting changes in the markets, TYROLIT never stops innovating. We take a little time to focus on some of those markets:

**TYROLIT in the foundry industry**

Foundries have undergone a major transformation in recent years, yet despite the stagnation in steel and iron casting it is generating steady growth with more than 100 million tonnes. Meanwhile, non-ferrous metals such as aluminium and magnesium alloys are increasingly coming into focus. Besides that, foundries have extremely diverse customer groups. Automotive manufacturers account for approximately 55 percent on the ferrous side and for over 84 percent on the non-ferrous metal casting side. The second most important customer sector for foundries is general machine construction with around 40 different industry segments.

Innovative developments in cast lightweight components for electromobility and the requirement for improvements in thermomechanical properties demand constant growth and flexible adaptation of the TYROLIT grinding solutions. Seamless monitoring in the manufacturing process, from the raw material to the finished end product, enables TYROLIT to produce consistently high tool quality and at the same time increase the process stability with the growing degree of automation for cutting and grinding applications.

TYROLIT works closely with customers, machine manufacturers and universities to identify trends in terms of new materials and manufacturing methods such as 3D printing at an early stage and develop products for them. Numerous solutions, specifically for the fettling process, have been developed in order to improve the working conditions for hand-held applications. Innovations like the 'Silentio' have made it possible to significantly reduce the noise pollution produced during grinding, while the 'FOCUR SA' and the 'Vib Star' have done the same for dust generation and vibrations respectively.

**TYROLIT in the precision industries**

A great number of industries require precise processes and finely coordinated components with tolerances in the micrometre range. Rotary tools have many advantages over stationary tools in terms of precision and lifetime and are superior from a process technology point of view. Whether the razor-sharp blade of a scalpel, the precision-engineered components of a watch or the perfectly tuned edges of a downhill ski, we have the right tool for it.

The extensive field of precision mechanics includes grinding tools and processes for electronic components, the grinding and polishing of a wide range of shapes such as shaping tools or injection moulds and many steps in machine construction.

As a Tyrolean company with its headquarters in the mountains, TYROLIT's contribution to alpine sport is a given for us. It supplies large well-known manufacturers for the production of skis and snowboards. The ski surface and the texture of the surface are ground and it has been able to make the work much easier and increase efficiency in the area of ski tuning. As a result, plastic surfaces and steel edges can be ground in one operation.

TYROLIT also plays an important role in the manufacture of numerous components in other areas of many precision industries.

When we talk about grinding, we automatically think about knives and the like. For every conceivable cutting tool, we have found the right solution for sharpening it and keeping it sharp. Kitchen knives, dinner knives, pen knives, tactical knives, axes, whittlers or chisels are just a fraction of the products that can be machined using TYROLIT grinding solutions.

Transforming a piece of raw steel into a high-quality knife that takes pride of place in the kitchen and glides effortlessly through meat and vegetables involves a number of steps. It goes without saying that material quality and craftsmanship play an important role in producing the blank.

For the knife to get its appearance and cutting ability, different TYROLIT precision tools are needed that are optimally tailored to the characteristics of the material to be machined.

**TYROLIT in the transmission industry**

Gears are among the oldest man-made components in the world. Due to the higher accuracy, machining processes are the preferred method for the industrial production of gears. Nowadays, hard-fine machining with non-defined cutting edge is increasingly used to improve the surface structure. The method offers numerous

advantages, especially in terms of geometry and surface quality, as the finished transmission's power transfer is significantly increased. This directly increases efficiency, which is associated with a reduced energy loss.

In the automotive industry, a significant shift from manual transmissions to automatic transmissions can be noticed. In addition, the constant increase in e-mobility will also have a lasting impact on the transmission industry as a whole. We are constantly working on the further development of perfectly tailored processes for all steps in the machining of gearings.

To achieve maximum performance, a transmission requires the optimum interaction of all components. The requirements for the machining of the individual components are correspondingly complex. Carriers, shaft components and the associated gearing all demand precise machining. Less noise, smoother running, long life and optimised performance data play a key role when it comes to choosing the right tool.

Gear grinding consists of three processes: continuous and discontinuous roller and profile grinding as well as gear honing. TYROLIT offers system solutions for all processes involved in the hard finishing of gearings.

**TYROLIT grain distribution**

TYROLIT diamond tools with TGD® technology enable you to work especially economically and more efficiently thanks to the intelligent TYROLIT GRAIN DISTRIBUTION system. The intelligent distribution of the diamonds ensures an evenly distributed load, optimised cooling and a constantly high cutting performance. This significantly extends the tool's lifetime and reduces the load on the machines.

Thanks to the TYROLIT Modular System, individual components can be used for different applications. This is not only efficient and makes work easier but also helps to save costs. One part of the TYROLIT Modular System is the ModulDrill™ quick clamping system which enables our drill motors to be attached to different TYROLIT drill rigs quickly and easily.

In addition to the wide standard range of tools and machines, TYROLIT offers individual services for a variety of customer-specific special construction applications. The experienced project services team is specialised in feasibility studies and develops customised system solutions in consultation with customers on the basis of an individual requirement profile.

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# Oil removal in machining operations

## A golden opportunity for cost savings and improved parts quality

Whether tramp oil in coolant or accumulated oil from parts washing, metalworking operations discover the benefits of efficient, well designed oil removal solutions.

To thrive, and in some cases survive, CNC machine operators are constantly driven to seek out new ways to reduce costs and improve finished part quality. However, many may be overlooking a significant opportunity to accomplish both mandates by focusing on improving the process of removing oil generated in the various stages of machining processes.

Whether "tramp" oil finds its way into coolant, or accumulates in parts washing baths, oil can wreak havoc on machining operations. Tramp oil in coolant can clog lines and spray nozzles, shorten tool life, stain workpieces and lead to inaccurate tolerances. The cost of replenishment and disposal of coolant is also substantial. In parts washing, oil that is not removed accumulates and contaminates wash solutions, resulting in frequent bath recharging, and poor adhesion during painting or plating.

There are also significant environmental treatment and disposal costs to consider. Fortunately, the solutions to removing oil are similar, regardless of its source. Oil that accumulates in tanks and sumps can be economically and efficiently removed through carefully designed continuous skimming and/or separation systems. When needed, these systems can be customised to meet the requirements of specific equipment and various configurations and sizes of coolant reservoirs from individual machine sumps to large central systems.

Tramp oils (hydraulic oil, lubricating oil and greases, and protective metal coatings) can be generated by continuous small leaks from equipment, or a one-time occurrence, such as a hydraulic line break.

However, for machine tools to perform at peak efficiency, the coolant must be free from contamination. When tramp oils combine with other contaminants in coolant, they can form a sticky substance that clogs lines and sprays. When oil contaminated coolant hits the tool, the cooling effect of the coolant is reduced, causing shorter tool life, product staining, inaccurate tolerances, and a smoky atmosphere in the plant.

Tramp oils in coolant are also a breeding ground for bacteria and can cause problems ranging from unpleasant odor to employee skin rashes. If not removed, bacteria also slowly destroy the coolant.

Removing tramp oil extends the life of the coolant, allowing it to be used much longer.

One cost-effective and simple method to combat tramp oil is a surface oil skimmer that mounts on the coolant reservoir and continually draws off surface oil. For this to be an option, the tramp oil must separate from the coolant and gather on the surface.

The most efficient type of oil skimmer uses a Free-Floating Collector Tube™ that actively and continuously removes the oil and grease as it rises to the surface of the water. As the tube moves across the surface, oil adheres to the outside, then the tube is drawn through a series of ceramic scrapers that constantly remove the oil, which then drains by gravity into a collection vessel. The tube skimmer operates continuously with minimal attention or maintenance. Tube Skimmers come in sizes and configurations to fit all applications, from small individual sumps to large holding tanks.

For applications where the tramp oil does not easily rise to the surface, minor modifications can be made to the coolant reservoir to increase tramp oil separation prior to skimming. This can include reducing water turbulence, preventing coolant from plunging into the reservoir so tramp oil does not break into smaller droplets, and installing barriers that act as baffles. However, if the oil is emulsified or entrained in the water, it must first be separated before skimming. In this case, the best option is a system that accomplishes both steps, such as the Separate and Skim (SAS) oil/water separation system from Oil Skimmers, Inc. For more than 50 years, the company has created skimmers and oil separation equipment that addresses applications from small individual machining centers to large central systems.

In some instances, space or access may also be limited, preventing the installation of an oil skimmer on or next to the coolant sump. The compact CoolSkim™, also from Oil Skimmers, provides a method of moving the coolant to a uniquely designed separator that facilitates the separation and removal of the oil, with the clean coolant being returned to the original sump/tank.

Another common machining process is

part washing to remove oils, coolant and other debris that accumulate during the various stages of the manufacturing process. If this oil is not adequately removed, poor adhesion can occur during painting or plating. Although oil accumulation has long been an issue, parts manufacturers seeking a higher level of product quality often incorporate oil removal solutions in high-end, automated parts washers.

"If the wash is not properly prepared and foreign substances are not removed from the metal in the wash phase, the finish (the 'dress') may not hold properly and it may not wear well," says Jim Petrucci, vice president of Oil Skimmers, Inc.

As the wash stage removes the oil, it accumulates in the wash solution. This accumulation contaminates the wash solution, resulting in frequent bath (wash) recharging or improperly cleaned parts. These problems lead to ever increasing expenses that include disposal of the contaminated wash solution, additional use of chemicals, costly downtime, and increased labour.

Even parts washer OEMs are quick to acknowledge the critical importance attributed to a wash that is free of floating oil. One Midwestern parts washer supplier, in business more than thirty years, addressed the issue of oil accumulation in the wash by installing an oil skimmer with its equipment. The product, the Model 5H from Oil Skimmers, Inc. is a fully automatic skimmer used to decrease downtime and increase bath life. With the skimmer, oil adheres to the outside of a closed loop tube as it is slowly drawn across the surface of the water, adjusting automatically to changing water levels. The oil-covered tube passes through scrapers that remove the oil. The clean tube then returns to the water surface to collect more oil. The recovered oil flows into a collection container and is virtually water-free.

"With the addition of the Model 5H to our equipment, we have happier customers. The metals are cleaned of oil, we've saved the customer time and money, and the final plating or painting will ultimately adhere better, look better, and last longer on the metal parts," said the company's director of engineering. "Because the wash is cleaner, they also notice better parts cleaning, less use of chemicals to combat contaminates, and better salt spray test results."

Another benefit of using a well-designed oil skimmer is that the process is less labor intensive.

"Downtime to recharge the water requires additional labor to restart the bath," he adds. "Plus, we do not have to monitor the wash as often, since we are putting in fewer chemicals. This oil skimmer can work unattended 24 hours a day without the need for someone to watch it."

According to Jim Petrucci, another parts washer OEM was motivated by increasing environmental regulations to add a skimmer to their equipment late in the design process, despite very little residual space for the unit:

"One of the challenges when applying a skimmer is the particular physical envelope available. If we don't have an off-the-shelf unit, we have the ability to modify the equipment and mountings to fit the requirements. In this case, our engineering team designed a solution that would enable them to put a skimmer in that piece of equipment."

Whether generated in machining or parts washing, CNC operators incur costs for the proper treatment and disposal of oil in wastewater and when disposing of coolant. In the case of coolant, one option is to pay to have the entire coolant mixture hauled away. However, waste haulers typically charge more if the oil has not first been removed from the mixture. Some will not take any mixture with oil.

The other alternative is to break down the coolant, discharging the water and disposing of the concentrate. Ultrafiltration and distillation are the most common ways to break down the coolant mixture, but each works better if any oil in the mixture is first removed. When free oil is eliminated from the coolant, the distillation process requires less energy; depending on the system, ultrafiltration efficiency increases from 20 to 70 percent. Certain coolants can be discharged into municipal sanitary sewers if they are oil-free.

With so much to gain, including immediate cost savings, installing an efficient oil removal system far outweighs the initial cost of the equipment. "Machining operations, including major aerospace and automotive corporations, consulting with us on oil removal solutions usually have one of three motives: to improve the quality of their finished parts, extend the life of coolants and wash solutions, and to meet the increasing environmental standards for treatment and disposal," says Jim Petrucci. "Given that the efficient and economical removal of oil can impact all three factors concurrently, it is something machine shops should be reviewing much more closely," he concludes.

For more information about oil skimmers, oil removal systems, or how to design an oil water separator for your oily water application, contact:

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**Tel: 001 440 237 4600**
**Email: info@oilskim.com**
**www.oilskim.com**

# Coolant filtration: savings and sustainability

## Experts in microfiltration VOMAT GmbH on reducing the ecological footprint of tool grinding with automated and energy efficient systems

**Climate protection: the challenges for society and industry are enormous. Resource-conserving production, sustainability, climate and environmental protection and the task of reconciling all these demands with economic efficiency while generating profits is challenging. However, many production plants still have the potential to reduce their ecological footprint and one way for metalworkers, especially tool grinders running state of the art grinding technology, to improve their environmental impact is by choosing a coolant filtration method which contributes to more sustainable production.**

Steffen Strobel, technical sales manager for German microfiltration system manufacturer, VOMAT GmbH, says: "Political commitment or the setting of goals is not enough. What is needed now is a solid action plan and the right market-based incentives to switch to alternative and climate-friendly technologies. Today many of our customers in the tool industry already want to grind their tools in the most resource-efficient way possible. In sales or planning meetings, they are increasingly asking whether our filter systems can contribute to sustainability in production in addition to being highly efficient and contributing to quality. The answer is yes; the VOMAT units can significantly reduce resource requirements, making a positive impact on both the environment, and ongoing consumable and energy spend."

### Exploiting optimisation potentials

In tool grinding, the filtration system provides the grinding process with lubrication and cooling in a pre-defined purity and volume flow. The heart of this system is the filtration of the cooling lubricant. Optimally filtered cooling lubricants have many positive influences on the manufacturing of cutting tools. In particular, they make the grinding process more economical and contribute to achieving high quality finished tools. Coolant lubricants which no longer need to be changed as often not only help to reduce maintenance time, but also lower the costs of fluid purchase, storage, recycling and energy consumption.


**VOMAT's full-flow ultra-fine filtration technology provides permanently clean oil of the highest quality (NAS 7). Demand-oriented filtration and backwashing ensures reduced load on the filter components and reduces energy consumption**

VOMAT manufactures filtration solutions from small stand-alone units to large-scale industrial central systems, which separate 100 percent of dirty and clean oil in full flow by means of durable high-performance pre-coat filters. The purity achieved is 3-5 µm (NAS 7 standard). State-of-the-art filter, cooling and disposal technology, including HSS pre-filter systems for mixed processing if required, ensure economic and ecological effectiveness. In addition, VOMAT filters are low-maintenance and, due to their compact design, take up little valuable production floor space.

### Adapted filtration performance to the production process

In VOMAT systems, the filter flow and backwash cycles are automatically controlled. This extends the service life of the filter elements and saves energy and costs. Many conventional systems on the market permanently filter at full filtration capacity, even if this is not required. VOMAT systems on the other hand, adapt to the production process. If, for example, the grinding machine runs at a slower speed, only the required amount of coolant is filtered. If a VOMAT central system provides filtration for several grinding machines, and some are not in operation, the filter capacity automatically adapts to the machining volume. At the same time, less cooling capacity is required. This reduces the energy consumption even further.

During cleaning in full-flow mode, the demand-oriented backwash cycle provides further advantages: with VOMAT filters, the backwash cycles are triggered by the degree of filter cartridge contamination. Once the relevant values are reached, the backwashing process begins, during which each filter is backwashed individually and with a time delay. The other filters ensure a continuous supply of clean oil. In the disposal unit, the dirty oil is separated from the sludge and then fed into the dirty oil tank. This fully automatic control of the filtration system keeps energy and operating costs low.

In addition, VOMAT technology controls the temperature of the coolant during the grinding process within a range of ± 0.2 K, providing accurate workpiece quality whilst also extended the lifespan of the grinding oil. VOMAT offers various design options for cooling systems, such as pallet- mounted units for easy removal and re-assembly on-site without service personnel, and auxiliary units with an external condenser for cooling. Another option is a cold water-operated cooling unit with a closed loop piping system, such as the VOMAT's

**The machine supply pumps correspond specifically to the VOMAT units in both capacity and performance. The cleaner the grinding oil, the longer it can remain in the system and can provide better protection for machine pumps and lines**

modular and expandable KWS 250 chiller, complete with circulating pump and Eaton controls. The cooling capacity is 250 kW for brine operation with a control accuracy of +/-1.0 K. This particular unit does not require a buffer storage tank, can be installed in industrial outdoor areas, and offers excellent energy efficiency while maintaining high-precision temperature control.

**Efficient recycling of valuable materials: getting the most out of your coolant**

Offering not only advanced high-performance filters which clean coolants extremely well and ensure energy efficiency but also an inbuilt automatic sedimentation system also allows for sustainable recycling. Thanks to the proprietary design features of the VOMAT system, the grinding sludge has a residual moisture content of only 5 to 10 percent after settling. The filter system can continue to operate during the removal and disposal of recyclable material and the sludge is deposited directly into transport containers provided by the recycling company, ready for collection. In addition, coolant


**VOMAT's modular and expandable KWS 250 chiller is an excellent example of technology designed for accurate temperature control (+/-1.0 K), whilst achieving a high rate of energy efficiency**

contamination from filter aids such as cellulose or residues of paper bands is eliminated with the VOMAT technology which not only saves money, but also resources and the environment.

VOMAT ultra-fine filtration units can be used for tool grinding machines processing carbide, HSS, or for a mix of the two and are available in various sizes to meet customer requirements. Standard flow rates are 70 litres/minute, 120 to 420 litres/minute and 480 to 960 litres/minute. In addition, customer-specific system configurations can be built to the required capacities for centralised systems.

Both central and standalone units can be adapted to customer-specific or changing requirements by means of various expansion modules, such as special cooling concepts, machine pumps, additional tanks and recycling options.

Steffen Strobel concludes: "Our systems manage the balancing act between productivity and environmentally friendly production. Sustainability comes from all aspects of the manufacturing process and the bottom line is that VOMAT technology saves many resources such as machines, working time, space, energy and raw materials."

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# New CP74 Series pneumatic die grinders feature rapid burr changeover to optimise productivity

Chicago Pneumatic has introduced its new CP74 Series of ¼" and 6 mm pneumatic die grinders, designed to optimise productivity and operator comfort. Delivering up to 20 percent more power than the CP91 range and with a collet design for quick and easy burr changes, the CP74 pneumatic die grinders can help optimise productivity in metal fabrication applications, as well as vehicle servicing and repair such as matching welded surface, deburring, and chamfering, amongst other.

The CP74 Series of ¼" and 6 mm pneumatic die grinders are equipped with a novel locking spindle system that makes changing the carbide burrs quicker and easier than standard die grinders needing two spanner wrenches. By removing the use of one spanner wrench, operators no longer have to place the tool in a vice or between their knees, reducing production stoppage times and improving productivity. CP74 die grinders further contribute to operational efficiency by offering a choice of six different heads, short or long, straight or angled (120°, 90°), to offer the best possible configuration for the application.

User comfort is another key attraction of the CP74 Series. The grinder's handles are made from thermoplastic rubber (TPR) which ensures that the operator can maintain a good surface grip. In addition,

the rugged composite casing on the CP74 die grinders acts as an insulator, reducing heat transfer between the motor and the sleeve. In combination, these features ensure that the operator can work comfortably for longer.

CP74 pneumatic die grinders operate between 22,000-28,000 rpm depending on the model. With the smallest grinder in the series weighing just 1.1 lb. (0.5 kg) and the largest grinder 2.43 lb. (1.1 kg), these tools offer excellent power-to-weight performance. With a maximum air consumption under load of 1.4 l/s (3.0 cfm),

the CP74 pneumatic die grinders are also economical to run.

All CP74 pneumatic die grinders have been rigorously tested to meet ISO quality standards, as well as the benchmarks for performance, vibration, noise, and durability that Chicago Pneumatic demands of all its tools.

Since 1901 the Chicago Pneumatic (CP) name has represented reliability and attention to customer needs, with construction, maintenance and production tools and compressors designed for specific industrial applications. Today, CP has a global reach, with local distributors around the world.

To find out more about Chicago Pneumatic's CP74 ¼" pneumatic die grinders, visit **www.cp.com/CP74series**. For details on the full range of Chicago Pneumatic's innovative solutions, go to **www.cp.com**, LinkedIn, Instagram, Facebook or Twitter.

CP employees start every single day with a passion to research, develop, manufacture and deliver new products that are meant to meet your needs not only today, but tomorrow as well. To learn more, contact:

**Chicago Pneumatic**
**Tel: 01442 838999**
**www.cp.com**

# Chamfering processes at Liebherr

**CNC chamfering with ChamferCut or Flex Chamfer**
Chamfering gears prevents the edges of the teeth from becoming brittle during heat treatment and reduces transportation and installation damage. Multiple processes can be chosen for this. Classic technology such as press deburring or chamfering with end mills are increasingly being superseded by CNC-controlled processes such as ChamferCut and FlexChamfer. These are extraordinarily economical and guarantee an excellent chamfer quality which can be reproduced very precisely. CNC controlled processes are easy to operate and minimise set up cost.

Liebherr knows the advantages and the limits for the various processes and individually advises customers with their selection. Requirements for an optimal chamfering process can be individually arranged by batch size, chamfer shape, subsequent machining or component geometry. Liebherr specialises in particular in the ChamferCut technology from LMT-Fette. As a pioneer in introducing this process and its development to being production-ready, Liebherr is determined to take this further in the future: By consulting with clients, both companies are working to improve precision, productivity and usability.

**ChamferCut - precise, quick and reliable**
- Precise chamfering geometry and quality, no material deformation
- Can be reproduced very precisely
- Easy operation, short setup times due to CNC control system
- Single-cut strategy: No additional finishing cut required to remove bulging on the lead
- Low investment cost and long tool life
- Ideal for subsequent finish machining
- Integrated chamfering device or standalone machines from Liebherr enable parallel machining
- Application range module 0.5-36 mm

**ChamferCut CG (Collision Gear) – chamfering despite interfering contour**
- Deburring the tooth space to the tooth root surface, even on interfering contours
- Chamfering including the root, even for collision critical
- More degrees of freedom with the chamfer divided between the left and right profile
- Can be implemented on Liebherr machines with a simple software update
- Batch sizes: suitable for medium and large-scale production
- Application examples: truck shafts, passenger vehicle idle gears and ring gears, industrial gearboxes

**ChamferCut IG (Internal Gear) – chamfering of internal gears**
- Chamfering of internal gears on both flanks in one cut
- Machining on compact standalone machine, e.g. LD 180 C
- Application examples: internal gears of plantenary and e-motive gearboxes

**FlexChamfer – maximum flexibility for external and internal gears**
- CNC-controlled advanced development of chamfering with end mills

- Development of variable chamfering forms with standard catalog tools
- Particularly suitable for external gears with or without interfering contours as well as shafts and internal gears
- Use in hobbing, shaping and gear skiving machines
- Parallel to machining (depending on the main machining time)
- Ideal for small and medium batch sizes
- Examples of use: stage planetary gears, double internal gears

"Precise, economical and widely usable: ChamferCut sets the benchmark for chamfering" says Dr. Oliver Winkel, head of Technology Development .

Since 1952, Liebherr has been manufacturing gear cutting machines, at the beginning still in Kirchdorf an der Iller, Germany. In 1962 production was relocated from Kirchdorf to Kempten in the Allgäu. Since 1969 the company has been operating under the name Liebherr-Verzahntechnik GmbH.

Liebherr-Verzahntechnik GmbH offers an extensive product program of machine tools and machine automation systems for economic manufacture of gearing products. The company supplies gearings, gearboxes, and slewing bearings to leading worldwide manufacturers.

The gear cutting machines product program is ideally supplemented by automation systems. Products for automation of machine tools as well as further innovative solutions for production and factory automation are offered in this segment. They support modern high-efficient production in all sectors.

**Liebherr-Verzahntechnik GmbH**
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# The Bruker Alicona guide to surface measurement

Surface finish may be measured in two ways: contact and non-contact methods. Contact methods involve dragging a measurement stylus across the surface; these instruments are called profilometers. Non-contact methods include interferometry, digital holography, confocal microscopy, focus variation, structured light, electrical capacitance, and electron microscopy.

**Profilometry**

The most common method in use today is to use a diamond stylus profilometer, and example is shown in Figure 1. The stylus is run perpendicular to the lay of the surface and the probe usually traces along a straight line on a flat surface or in a circular arc around a cylindrical surface. The measurement being defined as a relationship between the measurement length and the sampling distance.

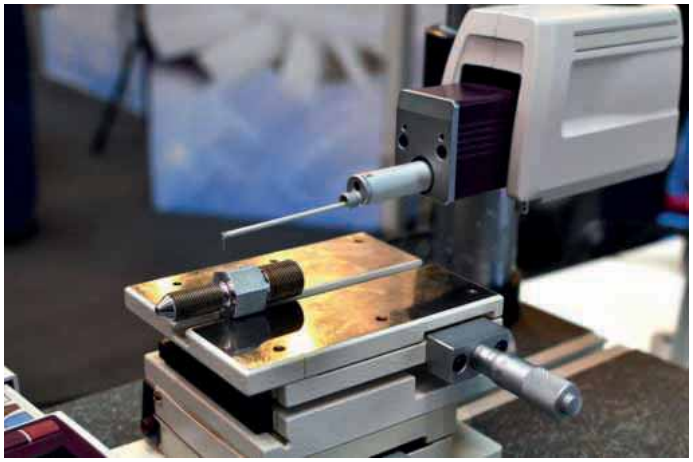


**Figure 1: A typical diamond stylus profilometer**

Commonly one sampling length is discarded from each end of the measurement length providing a 2D profile line. The disadvantage of a profilometer is that the measurement area is essentially a line of the defined length but is very narrow, typically between 2 µm and 5 µm radii. This results in a measurement which relates to the line and not to the surface being measured, this also provides limited or no information about the required function of the surface being measured. Also, there is the potential to damage the surface being measured, this is particularly true when measuring soft materials such as plastics and rubber.

Also, using this method it is extremely difficult to measure surfaces with form, for example radii and chamfer. The data provided is classed as profile roughness parameters with a prefix of R, e.g., Ra, Rz, Rv and is displayed as a 2D profile line with tabulated results.

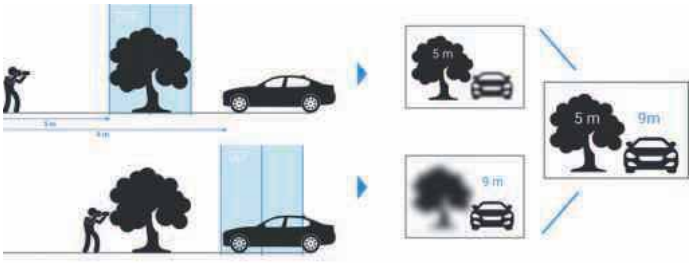
To provide true information about a surface it is necessary to measure using 3D parameters. Although it is possible to create 3D measurements with a profilometer by multi line scanning this is very time consuming, and data cannot be displayed in a pictorial form.

**Optical metrology**

There are a number of different optical measurement methods as outlined in the first paragraph of this article. With the exception of FocusVariation, all of these methods have been adapted to perform metrological measurements and as such have limitations in what they can offer. The FocusVariation principle has been developed exclusively for metrology and for the purpose of this article will be highlighted.

FocusVariation combines the small depth of focus of an optical system with vertical scanning to provide topographical and color information from the variation of focus. The main component of the system is a precision optics containing various lens systems that can be equipped with different objectives, allowing measurements with different resolution.

In use the fixed focal plane of the optic system is moved over the surface to be measured capturing information from the Depth of Field (DOF) as illustrated below.



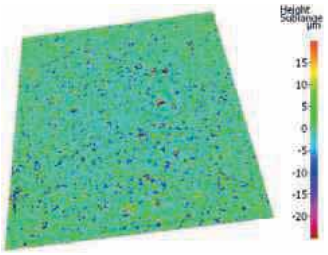

**How FocusVariation works**

In this process many thousand points of sharp data are collected to form a true 3D view of the surface, each data point is registered with the true colour of that data point and the 3D view is presented as a real colour 3D view registered to the data, this data provides the ability to measure. Typically, Focus-Variation delivers repeatable measurement results for surfaces from a local Ra of 0.009 µm at a lc of 2 µm. Focus-Variation is used to perform high resolution 3D surface measurement for quality assurance and research. Key applications are surface analysis and characterisation in, for example, tool & mould making, precision manufacturing, aerospace, automotive industry, all kinds of materials science, corrosion and tribology, electronics, medical device development. Due to its technical specifications the Focus-Variation technique is used for both form and roughness measurements.

**The measurement process:**

Once data is collected the user is presented with a full 3D view of the surface which can be displayed in true colour or in pseudo colour related to height, illustrated below.

**True colour data**

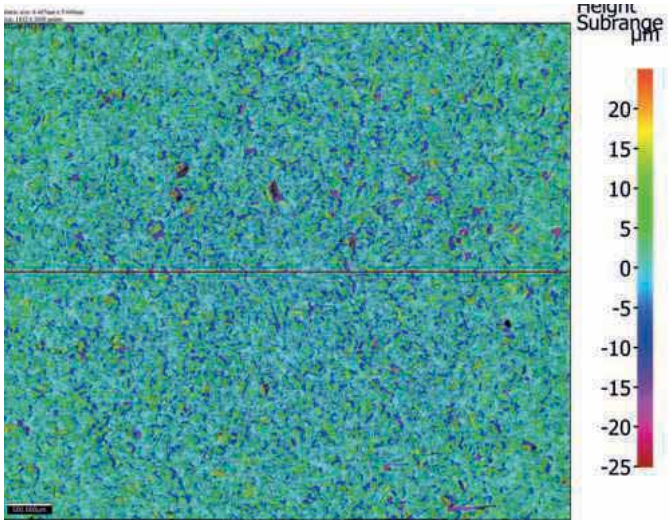


**Pseudo colour data**

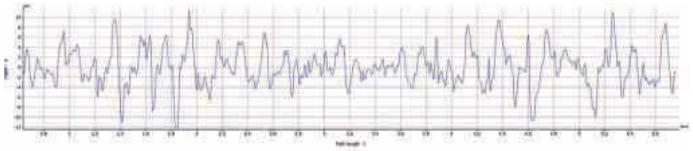
The surface to be measured is then levelled to the measurement plane using the workpiece coordinate system. Also available to users is a form removal function that allows the surface measurement of round and conical objects that are difficult to measure with tactile systems. Using this aligned data set it is now possible to measure the surface finish using both a line-based 2D system and an area-based 3D solution.

### Line based 2D System

The line-based solution provides the same measurement parameters as a tactile profilometer. But as there is no contact between the instrument and the surface and the profile line can be drawn at any position and direction on the surface with the tip width being replaced with a line width. This also allows surface measurements to be made on surfaces which would be difficult to measure with a tactile system, an example being gear tooth flanks, and also on soft materials which could be damaged by a tactile system. The measurements conform to ISO 4287/4288 and are provided as R values.




**Profile roughness line extracted across the surface of data set**



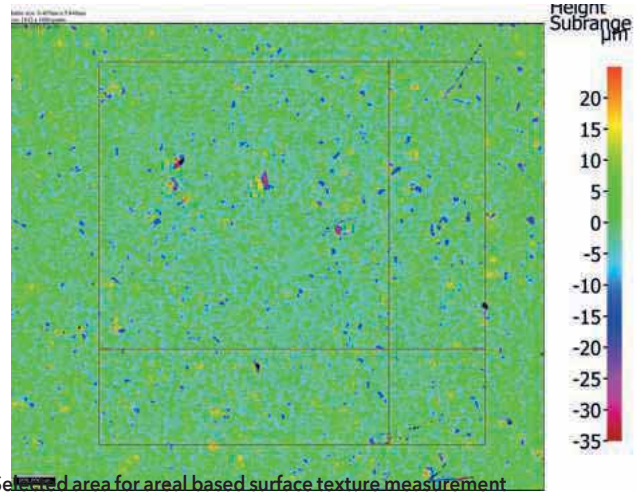
**Extracted roughness profile**

### Area based 3D System

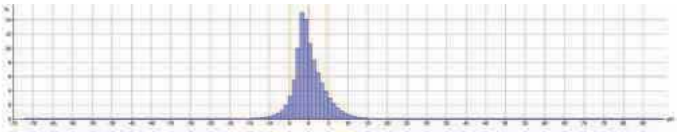
The restriction of a 2D system is that the information only relates to the line drawn and not to the overall surface, which is critical to understand surface function, the 3D areal based solution provides this.

In this method the same pre aligned data set is used in the surface texture module and the area to be measured is selected and a λc value is calculated to filter the surface and the measurement values are presented as S values. These values can be described as 3D equivalents of R values, an example is that Sa is equivalent to Sa but are calculated over an area rather than along a line and are therefore more representative of the surface. These parameters can also be described as functional parameters and allow surfaces to be measured according to their need, an example would be that one of the measurements provides information if a surface would be able to hold a lubricant or not if this was needed.

Full details on these parameters can be found at **https://en.wikipedia.org/wiki/ISO_25178**. These measurements conform to the ISO 25178 standard and are now becoming commonly accepted within Industry.




**Selected area for areal based surface texture measurement**



| Name | Value | Unit | Description |
|---|---|---|---|
| Sa | 3.049 | µm | Average height of selected area |
| Sq | 4.364 | µm | Root-Mean-Square height of selected area |
| Sp | 88.858 | µm | Maximum peak height of selected area |
| Sv | 71.478 | µm | Maximum valley depth of selected area |
| Sz | 160.336 | µm | Maximum height of selected area |
| S10z | 113.485 | µm | Ten point height of selected area |
| Ssk | -0.303 | | Skewness of selected area |
| Sku | 11.985 | | Kurtosis of selected area |
| Sdq | 0.439 | | Root mean square gradient |
| Sdr | 8.324 | % | Developed interfacial area ratio |
| FLTt | 160.336 | µm | Flatness using least squares reference plane |

**Areal results from surface texture measurement**

### Additional benefits of optical metrology

In addition to the measurement of surface finish, optical metrology offers the ability to measure geometric 2D and 3D form, difference (e.g., wear), 2D image measurement and contour which can all be made on the same dataset. Another advantage is that the data sets are stored in a built-in data base that allows easy recovery for later measurement related to quality assurance. Then, the latest developments in optical metrology can provide fully automated measurement solutions for both in machine and in the measurement lab which can provide the perfect solution for batch measurement. Full details on the Bruker Alicona range of optical metrology solutions can be found at **www.alicona.com**

**Bruker Alicona**
**Email: sales.alicona@bruker.com**
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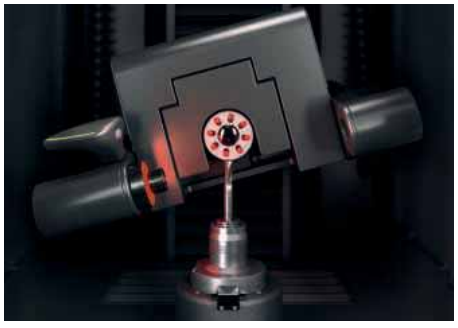
# ZOLLER meets the most demanding measuring requirements

Pitch tools such as taps or formers as well as hobs are among the most complex and time-consuming tools to measure. It is not only the large number of teeth, but also the large number of parameters that need to be checked for a holistic analysis of these tools. If the thread tools are viewed perpendicular to the tool axis, not only a single tooth is detected, but also other contour components due to the pitch, but these may not be attributed to the tooth cross-section itself. In order to make correct statements about these tools, these distortions must be eliminated.

For this purpose, the presetting and measuring machine manufacturer ZOLLER offers inspection and measuring machines with a swiveling optics carrier. The optics carrier is swivelled in on the pitch and is thus perpendicular to the tooth cross section. In this way, the outer contours of each tooth can be measured precisely and without distortion.

With its measuring and inspection machines »threadCheck« and »hobCheck«, ZOLLER offers a solution for the holistic measurement of tools with pitches such as threading tools and hobs, as well as all other tools for machining production. Compared to other measuring machines,



»threadCheck« and »hobCheck« are characterised by an additional sixth CNC axis on which the optics carrier is mounted. The optics carrier is swiveled to the pitch angle by the CNC axis for measuring tools with pitches and thus radiates perpendicularly onto the tooth surface.

Thanks to six CNC axes and the swivelling »orthoScan« optics carrier multi-sensor, the »threadCheck« can not only measure cutting tools of all types quickly and precisely, but also tools with pitches, such as gear cutting and threading tools, with µm accuracy and without distortion. The swivelling »orthoScan«multi-sensor optics carrier always finds the perfect viewing angle on the mold and thus measures distortion-free and µm-accurate even on molds with inclines.

With the »pilot 4.0« thread measuring program for metric, ISO, ANSI and Whitworth pipe threads, any parameters of taps, mills and formers, with or without spiralisation are measured fully automatically by simple entries and activation of the check box and logged on request.

If tools manufactured in series are to be tested 100 percent holistically and traceably, an automation solution is the obvious choice. »roboSet« is a robot connection to the inspection and measuring machine, which automatically removes the tools delivered in pallets, inserts them into the inspection and measuring machine and

starts the measuring process. A cleaning station beforehand and subsequent laser marking complete the test sequence. After the tool has been removed by the robot, not only is the individual tool data stored in the tool database, but the tools are also sorted according to good and bad parts or depending on the preselected tolerance values. In this way, the inspection and measuring machine can, for example, measure the series tools to be inspected overnight and be used during the day for individual measuring tasks or for presetting the grinding wheels.

The most important tool for tool manufacturers are grinding wheels. Their position and alignment are decisive for the results of the ground tools. The ZOLLER measuring and inspection machines can not only analyse the manufactured tools, but also measure grinding wheels and grinding wheel packs. This data can also be exchanged directly between the grinding and inspection machine, helping to achieve and maintain the quality of the tools being manufactured from the very beginning. In addition, the grinding wheels measured outside the grinding machine increase the machine running time and optimise the setup time, a clear contribution to greater efficiency.

In a special measuring program, all grinding wheels and grinding wheel packages can be measured directly according to the FEPA standard with machines from ZOLLER. The grinding wheels are simply selected in a photoreal input dialog, then the measurement is also carried out automatically and operator independently. These measured values can be transferred to the grinding machine and the grinding process can start with the correct grinding wheel parameters.

**ZOLLER UK**
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# Hardness testing doesn't have to be hard

Hardness testing has long been one of the most widely used testing procedures, conducted on a huge variety of applications ranging from university laboratories for research purposes on new materials to large manufacturers of automotive and aerospace components where standardised material properties are key to the success or failure of a particular component or sub assembly. Coatings and case hardness treatments also need to be able to prove they are as hard as specified and that the depth of the hardened structural layers match the intended application.

Since the applications for hardness testing are so broad, the variety of machines available also pose what can be a confusing and complex choice of features and software options. Having supplied sample preparation equipment and consumables for over 30 years, Kemet has often found the cost of a hardness tester to be much more than a complete suite of Kemet machines necessary to prepare a sample for hardness testing.

For the majority of applications, the choice of hardness tester does not need to be complicated. The testing is performed according to ISO and ASTM standards which dictate how a unit must calculate sample hardness and how they must be calibrated.

Kemet has announced the launch of the Metkon Duroline series of hardness testers, a range of benchtop hardness testers for Vickers and Knoop measurement with integrated 22" full HD multi touch monitor. The Metkon N-sure software package is incredibly easy to use and, like most machines on the market, has the ability for automatic multi measurement when coupled with the automated x/y stage option. The software can automatically generate test reports and has built in CHD, EHT and NHT measurement with automatic contrast and focus for the most accurate results.

With a small variety of models, test loads from HV0.01–HV30 can be accommodated. Aimed primarily at the material testing laboratory and the smaller component production QA, in particular small precision parts, thin material or wire coatings, the Duroline range has everything you might need at a competitive price.

**Kemet**
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**Email: sales@kemet.co.uk**
**www.kemet.co.uk**

# Modified couplings prove their worth in diamond polishing machine

When a UK diamond toolmaking machine manufacturer needed a custom coupling for use on its line of new extreme material finishing machines, it turned to Huco for a precision solution. Huco was able to meet the requirements by modifying a membrane-type coupling with special bore sizes and keyways, and ship it to the OEM cost-effectively in the relatively small quantities required.

The machine manufacturer is a leading supplier of specialised, individually built, high-precision equipment to the polycrystalline diamond industry and to the single crystal diamond and gemstone industry. With customers across the globe, the company exports over 90 percent of its machines, meeting the needs of users who need to precision polish, grind and shape some of the world's hardest and most extreme materials.

One of the company's key product ranges is its planetary scaife benches, used to polish facets on single crystal diamond tools or for gem diamond polishing. These benches combine the high speed of rotation of a scaife plate with a relatively slow, smooth, horizontal planetary motion. This motion gives a number of advantages over a standard scaife. The plate does not become tracked as polishing takes place over an annular band, so the scaife surface remains smooth and flat. In addition, the motion results in a constantly changing angle of attack, with an action that produces line-free facets without the need for any manual finishing.

In a new design of planetary scaife bench, the company required a coupling for the servo motors controlling the XY-axis during polishing, with specific but unusual bore sizes of 1.5" with a 1/8" keyway on one bore, and 14 mm with no keyway on the other. Given that the highest levels of reliability and precision were essential, the company turned to Huco. It knew of Huco's reputation for highly reliable couplings, and the two had enjoyed several previous successful collaborations.

**The Flex M bolted series membrane-type coupling was the best fit for the planetary scaife bench application**

### Cost-effective modification

With over 40 years' experience to call on, Huco offers machine builders access to a convenient and responsive customisation service that encompasses its complete range of standard couplings. A brand of Altra Industrial Motion Corp., a leading global supplier of power transmission equipment, Huco can offer cost-effective modification and customisation on any of the products in its extensive range, even when only relatively small batches are required.

Offering an in-house design and manufacturing capability, Huco has built a reputation for being able to provide customised couplings with a wide range of specifications on short lead times. The company can complete the design process in days, with average sized orders manufactured and delivered in a couple of weeks.

Working closely with the customer's technical team, Huco engineers selected the Flex M bolted series membrane-type coupling as the best fit for the planetary scaife bench application. These couplings feature heat treated, spring-quality, stainless steel, thin pressed membranes; torque is resolved to simple tensile stresses



in opposing segments of the membranes. The couplings have near-infinite life and a dynamically balanced construction which makes them suitable for applications requiring high rotational speed and motion integrity.

A two-stage version was chosen for its short envelope and low bearing load, as well as the ability to accommodate up to 2 degrees of angular misalignment. Huco was readily able to modify the coupling to provide the required bores and keyways, in a 47.9 mm long design with a peak torque rating of 11.3 Nm.

While a relatively small order such as this with an appreciable level of customisation might have been a challenge for other coupling manufacturers given the deadlines and target price, Huco's lean, rapid-changeover production capability made it possible to manufacture the small batch of custom couplings as required.

Huco managing director, David Lockett comments: "Customised precision couplings are vital for many builders of specialist equipment like planetary scaife benches. The coupling must offer not only the requisite performance for the application, but also meet the integration requirements. An off-the-shelf coupling will frequently not offer the specialisation required, so a customised component is often the best option."

For the customer, the experience of working once again with Huco reaffirmed its excellent reputation for price and on-time delivery. As well as meeting the design specifications in a cost-effectively customised product, the modified Flex-M couplings have also proven extremely reliable, with the machine manufacturer reporting no field issues despite the highly demanding nature of the application.

In a new design of planetary scaife bench, the company required a coupling for the servo motors controlling the XY axis during polishing, with specific but unusual bore sizes of 1.5" with a 1/8" keyway on one bore, and 14 mm with no keyway on the other

**Huco Direct**
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**www.hucodirect.com**

# Placing more lustre on high-value components

The new AF plastic media from Walther Trowal allows placing an excellent lustre finish on high-value workpieces. At the same time, a specially developed mix of mineral abrasives improves the stability of the finishing process. Moreover, the abrasive mix facilitates the compound handling and the overall operation of the mass finishing machine. It generates a particularly smooth and/or a pre-plate finish on high-end workpieces in combination with a high lustre. For example, it produces excellent finishing results on turbine blades for jet engines or orthopedic implants, such as artificial knee joints.

For the new media, Walther Trowal utilises an innovative mix of mineral abrasives that was specially developed in the company's chemical lab. It produces not only a very smooth surface finish with a high lustre but also keeps the pH value of the process water stable over a long period of time. This allows the compounds to develop their full effect. Another benefit is that the pH value does not have to be monitored so frequently anymore and that this value does no longer have to be corrected with special additives. Therefore, the compound dosing has been greatly simplified and does no longer require any special process knowledge.

First results have shown that finishing processes can be successfully run with the new media within a relatively wide hardness range of the process water. Furthermore, the new mix of mineral abrasives is wearing at a lower rate resulting in a higher media uptime. The new media therefore allows operating the mass finishing equipment much more economically.

The new AF media generates a particularly smooth and/or a pre-plate finish on high-end workpieces in combination with a high lustre

Angelika Helten, manager of the Walther Trowal test lab in Haan, explains why the company has placed such a high priority on this development: "In some high-intensity finishing applications, based on the underlying physical events, over time the pH value of the process water becomes smaller. With the new media we were able to develop a long-term and sustainable system that no longer requires the addition of corrective chemical additives. The new mineral abrasives mix is also beneficial to those customers, who have to deal with less challenging finishing tasks. Apart from maintaining the stability of the pH value, the AF media offers numerous additional advantages."

The basis for the new development was the bestselling high-quality media type V 2030. This is approved for many applications, for example, in the aerospace, automotive and medical engineering industry.

The media and finished workpieces are separated from each other in the separation zone at the exit of the rotary vibrator

The new media, developed in Walther Trowal's chemical lab, produces not only a very smooth surface finish with a high lustre but also keeps the pH value of the process water stable over a long period of time

Christoph Cruse, general sales manager at Walther Trowal, explains why this development project was so successful: "Walther Trowal is one of the few companies who develop and produce the components for the entire mass finishing process in-house. This includes the equipment, the consumables and the process water cleaning systems. All of them are perfectly adapted to each other. Such an arrangement allows us to offer a significantly more comprehensive professional support after receipt of a purchase order than distributors who are dependent on different suppliers. In the end it is our close proximity to our customers that makes us so successful."

Walther Trowal supports its customers, not only through processing trials with the customer workpieces in its test lab, but also by offering comprehensive support with all kinds of approval procedures, in the field of work place safety, REACH conformity questions or Cradle-to-cradle (C2C) certification.

The entire exhaust air, generated during the production of the AF and all other Walther Trowal plastic media, undergoes a thermal after-treatment and is in full compliance with environmental regulations.

**Walther Trowal Ltd**
**Tel: 0121 270 4555**
**Email: info@walther-trowal.co.uk**
**www.walther-trowal.com**

# Unitised and convolute metal finishing wheels

Abrasives for Metal

Unitised and convolute wheels can save a lot of time by eliminating several stages of traditional metal polishing methods.

With the right product at the right speed you will be amazed what can be accomplished. Below are just a few of the application opportunities that these wheels open up.

These wheels are formed from re-processed non-woven abrasive to give a light texture with the characteristic of controlled aggression. Unitised wheels are cut from slabs and are usually supplied in maximum thicknesses of 13 mm. Convolute wheels are cut from a 'log' which has been rolled from the base material before final baking. The abrasive material is thus in a spiral or convolute profile within the 'log'. The wheels can then be cut to almost any thickness, with 25 mm and 50 mm being popular widths. The most aggressive will remove welds whilst the finer grades will brighten the metal leaving fine finishes.

The selection available from Abrasives for Metal is separated in to four catagories:

Unitised General Use Wheels: for fixed spindle machines. Wide range of sizes and grades available. General purpose unitised finishing wheel range offers great opportunities for time saving in metal finishing and polishing using bench machines.

Convolute General Use Wheels: for fixed spindle machines. From 150 mm upwards. Ideal solutions for fine finishing hard alloys. A full range of 3 mm and 6 mm wide unitised Finiteasy wheels in stock, as well as a suitable wire brush wheel for aggressive weld cleaning.

Wheels for Finit-Easy Machines: all these wheels are 6" / 150 mm diameter and are either 3 mm or 6 mm in width. These unitised wheels are spindle mounted making them ideal for cleaning & polishing metal with drills and air tools.

Spindle Mounted Unitised Wheels: convenient for finishing shapes and profiles with air tools or drills. These discs fit directly onto the flanges of a 125mm polisher providing a quick and cost effective means of removing and polishing corner welds.

Abrasives for Metal was established to support those who work with metal. It is thus application focused, rather than just being about products and prices. Each product page starts with an outline of the applications the products are for, which helps give guidance and re-assurance that you are buying the right thing for your metalworking application. Whether you work with the hardest grades of stainless steel, or soft non-ferrous metals, we have the optimum abrasives to achieve professional finishes fast. Whatever your involvement in using abrasives on metal, cutting, grinding, shaping, weld blending or surface finishing, we offer you low prices, great service and superb products.

If you would like advice on how to improve your process and finish, contact:

**Abrasives for Metal**
**Tel: 01768 864202**
**Email: enquiries@abrasivesformetal.co.uk**
**www.abrasivesformetal.co.uk**

# New addition includes robot tool loading and laser marking

Brighetti Meccanica is a manufacturer of high-precision broaches and a pioneer in digitalised production planning. Based near Bologna Italy, the company manufactures broaches for multi edge, profile and special flutes plus, among others, broaching tools for Torx wrenches. For its fully automated production (using Industry 4.0), the company relies on SCHNEEBERGER technology.

"We decided to order a second Gemini NGM after our positive experience with the first one," says Dr Negrisoli, owner of the company. The second Gemini arrived this time complete with robot tool loading and laser marking. "It is with great satisfaction to walk through the workshop and see that our production is fully automated," adds Dr Negrisoli, "because scrap is practically zero."


The work cycle includes preparation of the production batch at a workstation in the technical office. The machine is also integrated into the digital image of the factory layout according to specifications entered in Industry 4.0. At the machine, the operator starts the next production job. With each piece produced, the Gemini checks the main dimensions and continues as long as they are within tolerance. If not, it intervenes and automatically corrects the parameters to keep the product within the required tolerance.

Machine operator Luca proudly states that the Gemini NGM produces repeatably and continuously with deviations well below 1/100 (0.0004") of a millimetre. The finished part is removed by the robot, air cleaned and laser marked before deposited into the correct pallet.

As for the new Qg1 software, according to machine operator Andrei Rinca, a real leap in quality has been achieved, especially thanks to the STEP interface. The technical department creates 3D models of the workpiece and these are imported into the SCHNEEBERGER software, which returns a simulated grinding cycle in just a few steps. The result can be immediately executed on the machine.

Great importance is also paid to the digitalisation of production at Brighetti Meccanica. Dr Negrisoli is proud of his automated inventories, which together with the machines are integrated into Industry 4.0. This makes it possible, among other things, to retrieve production statistics or prepare quotations with precise prices, knowing the cycle times in advance.

"I see our future together with SCHNEEBERGER," he says, "not only because their machines and software meet all our technical requirements but also because of the relationship and trust we have in the Italian subsidiary. Competent technicians are always quickly at our side and on time with their SCHNEEBERGER Rapid Support Hotline."

For SCHNEEBERGER, the close cooperation with the dynamic and technology-savvy company BRIGHETTI MECCANICA is highly gratifying.


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Service-oriented, there is a dense network of service stations facilities local to customers. The focus of all of the development teams in the company headquarters and the in-house manufacturing enables us to implement new ideas quickly. SCHNEEBERGER relies on its own expertise in many special areas, including the development of its own Quinto grinding software.

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# Sharpening service benefits from VOLLMER automation during pandemic

The global pandemic has impacted businesses around the world, but for Canadian company Aiguisatek the impact was compounded by stringent local regulation in the Quebec province that all but shut down manufacturing in the area. Luckily for the Delson-based company, its investment in a VOLLMER CHD 270 8-axis TCT circular saw blade sharpening machine with the VOLLMER ND250 automation station enabled the company to run unmanned production throughout the pandemic.

Founded in 1986 by Mario Dion and Conrad Goulet, the 15-employee company designs, manufactures, sharpens and services cutting tools, circular saw blades, router bits, cutter blocks, profiling tools and special tools for the wood, metal, paper, plastic and composite processing industries. Like many businesses, Aiguisatek started with one machine in a garage with the founders focusing primarily on saw blades and router bits. Aiguisatek had a promising start with the combination of highly skilled engineers and a VOLLMER Akemat grinding centre.

Since its inception, the company has grown exponentially and expanded its product and service offering, something that has been supported down the years by six VOLLMER Akemat circular saw blade sharpening machines. In 2011, the daughter and grandson of company founder Conrad Goulet took over the business. Lisa Goulet and Jonathan Riberdy have since driven the business forward by moving to a new 14,000 sq ft$^2$ facility, investing heavily in new machine tools and implementing a strategy to diversify into PCD cutting tools.

In 2013, the company realised that its saw blade servicing department was reliant on ageing Akemat machines that required significant labour resource to keep up with its weekly demand of 350-400 saw blades. This was compounded by the increasing requirement for 80, 100 and 125 mm split scoring saws that had to be manually processed.

The answer was a VOLLMER CP200 4-axis CNC face and top grinding saw blade sharpening machine. Jonathan Riberdy says: "The demand for split scoring saws was

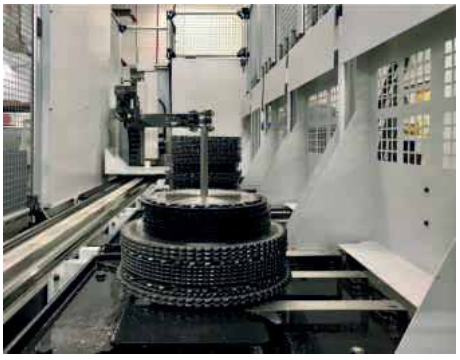
**The VOLLMER CP200 Being Programmed at Aiguisatek**

increasing and each blade would take up to 15 minutes to process manually. Buying the VOLLMER CP200, we reduced production time to 3-4 minutes. This alleviated the pressure and capacity demands on both the Akemat machines and the staff. The VOLLMER CP200 also gave us a lot more: it improved our re-grinding and service quality; it improved our throughput and the versatility of the machine allowed us to produce blades with more complex geometries."

"Back in 2013, we had several saw blades that were problematic. These saws had to be subcontracted out for re-grinding. Just one example was a 10-inch diameter saw blade with a fine pitch of 130 teeth. The CP200 enabled us to bring challenging blades in-house and eliminate subcontract costs and the reliance on third-party suppliers. The CNC control unit and the software on the CP200 also made the setup and programming extremely quick and efficient."

In 2015 Aiguisatek expanded into PCD cutting tools, increasing its offering and market share with existing customers as well as win new clients. Since this diversification, Aiguisatek has witnessed 25 percent year on year growth, expanding beyond its local customer base to support clients across the Quebec and Ontario areas. Of course, such aggressive growth not just in PCD tooling but also TCT saw blades required additional investment. So, in 2019 the company acquired a VOLLMER CHD270 8-axis tooth top and face grinding machine with the VOLLMER ND250 automation solution as part of a $1.5 million investment program.

Aiguisatek president Lisa Goulet says: "PCD tooling has been a game-changer for us and it has accelerated growth. In a short time, the breakdown of our products is now 35 percent PCD and 65 percent carbide tooling. Simultaneously, our TCT saw blade department has grown by an average of 15 percent year-on-year and we are now servicing over 1,000 saw blades a week. We wouldn't have sustained this growth without the investment in the VOLLMER CHD270 and ND250. Almost 90 percent of our customer base is in the woodworking industry. We now have three staff delivering/collecting saws and tools daily to manufacturers of everything from cabinets and furniture through to windows, doors and the construction industry."



**The VOLLMER ND250 automation station loaded with a variety of saw blades**

**The VOLLMER ND250 pallet being unloaded with saw blades machined on the VOLLMER CHD270**

With production requirements increasing from 350 to 1,000 blades a week, the VOLLMER CHD270 was a necessity. Jonathan Riberdy adds: "While increasing production output, we had ageing machines and two experienced but also ageing operators, running seven machines non-stop every day. This bottleneck was a stressful environment for the operators

whose vast experience kept inconsistent quality to a manageable level. We knew we needed a solution and the CHD270 provided it."

The CHD270 installed in 2019 can process saw blades from 3.15 to 33 inch diameter while the ND250 4-axis double gripper automation cell has five carriages to accommodate up to 450 saw blades or a maximum load of 1,500 kg. This changed the game for Aiguisatek, a growing business in a stagnating marketplace.

Jonathan Riberdy recalls: "Saw servicing changed overnight. We went from two operators running seven machines non-stop to one operator working across the CHD270, the CP200 and one or two Akemat machines. With the VOLLMER CHD270, our operator can spend two hours loading and unloading around 150 saws and then setting the machine to run for 24 hours unmanned, giving the operator time and capacity to work on other machines.

"The VOLLMER CHD270+ND250 runs 24 hours a day six days a week, giving us the same weekly production capacity from one unmanned machine as we used to get from two men and seven machines. Instead of running seven machines simultaneously for 10 hours, the CHD270 reaches the same daily output by running through the night unattended. Not only does the VOLLMER make the time and output up through week nights, but it runs unmanned over the weekend too. Now, we run about 10-15 percent of our blades through the Akemat machines for a couple of hours a day with the CHD270 doing most of the saws.

"The VOLLMER CHD270 instantly improved the quality and consistency of our saw blades. With in-cycle blade probing and automated wheel dressing, the repeated quality really surprised us. It was a huge difference when compared to our older machines. When combining the stability and stiffness of the CHD270 with its in-cycle calibration and automation, the quality is outstanding," says Jonathan Riberdy. Like the CP200, the CHD270 has a user-friendly interface that simplifies programming with almost limitless tooth geometry opportunities. "Our price point maybe a little more expensive than our rivals, but we deliver quantifiable savings with test reports. Our expert engineers will consult with customers on applications and material types to maximise performance, precision and reduce costs. The ability to easily create a variety of geometries with unsurpassed quality on the CP200 and CHD270 supports this service."


Aiguisatek president Lisa Goulet and son Jonathan Riberdy

By creating test reports for clients, Aiguisatek can follow the life cycle of saw blades from new through to the final re-grind before blade replacement. Compared to its rivals, Aiguisatek can re-sharpen blades up to 20-25 times before renewing whereas competitors can only achieve up to 10-12 regrinds before a costly blade replacement. Aiguisatek saw blades can achieve up to 50 percent greater tool life and they can increase cutting metres by more than 30 percent per re-grind. This is credit to the combination of expert on-site engineers and the production processes on the VOLLMER CHD270 and CP200.

In conclusion, Jonathan Riberdy says: "With the VOLLMERs we know exactly what we are taking off each tip every time we do a re-grind. There is no inconsistency, and this gives the blades a much longer tool life. For new customers that query our price point, we show them the VOLLMER machines their blades are being made on and that fills them with confidence in our quality."

For Aiguisatek, the pandemic has been a painful period that has seen some customers enter into liquidation, a factor compounded by pandemic market conditions and regional legislation that has restricted trade to 'essential manufacturing business only'. Lisa Goulet says: "At Aiguisatek, we had challenges like every business. At the height of restrictions, our business was down to just 30 percent. The challenge for us was satisfying this low level of production with no staff. Our staff were not at work due to safe-distancing regulations and Jonathan and I ran the business between us.

"Moving forward, we are happy to report that we returned to pre-COVID business levels last year and as of October, our annual growth rate of 25 percent is back on track." It looks like Aiguisatek may need more VOLLMER technology soon.


Aiguisatek director Jonathan Riberdy Programming the VOLLMER CHD270

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# Mictu sees "eye to eye" with ANCA

Established in 1986, Mictu's core business is the eyewear industry. As the company has grown they expanded into aerospace, automotive, dental, and mechanical. Boasting a team of 15 people and producing more than 200,000 tools per year, Mictu exports tools to China, Hong Kong, North and South America, Switzerland and Germany, as well as servicing the local Italian market.

Andrea Colavo, son of the founder of Mictu says: "There has been significant growth in our company since its beginning. We have a big body of knowledge as the eyewear industry gave us the opportunity to test our tools in many different materials giving experience in working with many kinds of plastics and metals."

The eyewear industry is different from other kinds of industries, mostly because it's fashion. Eye wear trends are constantly changing and customers require different tools to machine different shapes. The industry also uses very small tools and Mictu have produced tools with a 0.2 mm diameter mill. For example, a hinge requires very tight tolerance, with drawings often specifying plus or minus one hundredth of a millimetre.

Andrea Colavo continues: "We are a curious team who understand the value of trying new approaches and materials. If a customer is asking to use a material we have no experience in, we ask them how these material reacts to machining and describe the chips of this material. This helps us build a picture of how the material reacts to cutting. We make a sample tool and analyse its performance. Is the tool working correctly or does it require adjustments? With the ANCA 3D simulator we can make these adjustments to produce a second batch and try again at the customers."

Mictu has developed many different tools for many different materials. The most common plastics are nylon or polycarbonate and metals are titanium, stainless steel or cast iron.

"I think that anyone can make a tool, especially now that we have more intuitive software, adds Andrea Colavo. "However experience is still key. Cutting tool manufacturers should consider the dynamics of the grinding wheels and need to know the right speed that will not cook your material as otherwise it will break like glass.


"Generally we start from a drawing of the finished part and ask our customer how he wants to machine their component. Next we use our ANCA 3D simulator software program to simulate the tool to evaluate the best performing shape for that tool.

"We started using 3D simulation with an ANCA MGX that we bought in 2002. The 3D simulator has changed the way we make tools, mostly because using this software means we are making less errors. The characteristics that make a tool perform best is choosing the right material.

"A cutting edge must be appropriate for the material you have to machine for example, sometimes a very sharp cutting edge is not the best choice. Very sharp edges are weaker than a rounded edge and can vibrate more. So for soft materials you need a very sharp edge but for hard to cut materials you need a stronger cutting edge. I have found it is important to make mistakes. This means you can learn what is not working and that helps you next time you are designing a tool."

ANCA's MGX has produced more than 350,000 pieces and is still running

Mictu invested in an MGX in 2002. Andrea Colavo recalls: "It was our first ANCA and is still performing with more than 350,000 pieces manufactured over the years. We found the MGX is a very good machine for producing small to medium batches of very small tools.

"More recently we purchased two new FX7 Linears because of their flexibility. They are excellent machines for producing varied sizes batches of tools. So far, we have been running them all week, overnight and on the weekend with big batches. During the day we use them to produce smaller batches. On the FX7 we mainly produce drills, step drills and mills and sometimes even end mills with a profile.

"The FX7 can produce very different tools in the same batch making the machines extremely efficient. Another big advantage of these machines is that we can measure the tool without looking at it. The machine has a laser that measures and if necessary, corrects during the grinding process. Even if no one is looking at the machine, we know the machine is automatically taking care of the tolerance of our tools and that the end quality will be high. I sleep much better because I know the laser is doing its job checking the diameter of every mill you are producing.

"We use the iBalance to ensure our wheel packs are balanced, reducing the vibration on our tools. This is fundamental when you're making very small tools. If you have even very small vibration, you're cutting edge will be hammered and cheap. If you have it balanced well, it will work much smoothly and have a nicer cutting edge."

"Personally I also liked the appearance of the machine. With the new Linear models, we expect a longer machine lifespan and improved surface finish. The small footprint is welcome and its many features help with the repeatability of our tools. In summary we choose the ANCA FX7 Linear because it is a complete package with a wheel changer, large loader, laser measurement technology and has 3D Simulator software."

Mictu recently moved to a new facility and is reaping the benefits of investing in custom design. Andrea Colavo continues: "The biggest benefits we've seen moving to a new facility was starting from a blank sheet. We decided to put all the pipes needed for the oil for the grinders underground to make a clear surface with less stuff that can leak on the floor. The measuring machines have been installed in a separate environment to keep them on a steady temperature. Since moving we have seen improved production, better quality control and overall we are more efficient and have a better environment for our people because it's clean and fresh.

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# Croom Precision Medical enhances cleanliness with new MecWash installation

The commissioning of a new MecWash MWX400 has led to "big wins" for the quality team at Croom Precision Medical, the Co. Limerick-based manufacturer of medical implants and instruments.

Set up in 1984, the company is a FDA-registered contract manufacturer of orthopaedic implants, specialising in designing and manufacturing components for the medical device industry, and machining and handling precious metals for use in a sterile environment. Croom Precision Medical supplies precision components and high value consultancy services for medical applications, like orthopaedics, trauma and extremities, cardiovascular and vascular.

The MecWash MWX at Croom Precision Medical has "raised the bar" for sterility of medical implants. Located in County Limerick, Ireland, the company has invested €8.6 million into its new production facilities, manufacturing Class I, II and III medical implants and instruments. Part of the investment went into a MecWash MWX400 to support the exacting cleanliness standards required of medical equipment, increasing decontamination levels, according to Patrick Byrnes, chief executive officer of Croom Precision Medical:

"In the manufacture of Class II and III medical implants here at Croom Precision Medical, we must raise the bar on qualification criteria to ensure that every implant is prepared for sterility. After all, everything we produce here ends up in a human body somewhere around the world.

"The MecWash system is utilised in our validated production process. The system has undergone full qualifications in installation, operation and process. These conditions test the process under 'worst case cleaning conditions' according to a set of parameters defined by our quality team.

"It's imperative that our products for the medical industry are cleaned with the sophistication required. Everything in the machining process, all oils, contaminants, swarf, tissue papers; all of these elements must be removed in the cleaning process as the standards for medical equipment are so stringent," he adds.

"Previously we used a series of single modular ultrasonic baths. We were limited by volume, pressure and power. The MecWash machine meets all of our requirements and more by giving a controlled, validated outcome on each processing cycle. This was a big win for our quality team where operator interference was completely removed. In addition, the system's cycle time is a great deal faster, enabling our operations team to get more production through on a shift basis. It's a big win."


**The MecWash MWX at Croom Precision Medical, which has "raised the bar" for sterility of medical implants**

Croom Precision's investment also brings new advanced grinding machinery, CNC, finishing and metal inspection machinery to a factory floor being expanded by 30,000 ft$^2$.

Patrick Byrnes continues: "In order to position ourselves for continued success on the global stage and attract new customers from the North American and European markets, we've made the necessary investments into new equipment for our manufacturing facility."

John Pattison, managing director of MecWash, says: "This application of the MWX400 is further proof of our credentials within the healthcare industry. We have a proud history of providing the immaculate cleaning standards required by the medical and precision engineering industries."

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.

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

For more information, contact:

**MecWash Systems Ltd**
**Tel: 01684 271600**
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# New JetLaser M100 makes light work of manual laser cleaning applications

The traditional methods used to remove rust, debris or other surface contamination from components typically involve either physical contact with the part through brushing, scraping, polishing and shot blasting or alternatively through the use of dry ice or chemical substances. Each of these approaches have their own drawbacks as they are either abrasive, which can potentially damage the base material, or in the case of chemicals, somewhat aggressive and through their use potentially add to environmental pollution.

Laser cleaning, however, offers a highly efficient, contact and consumable free alternative which is gaining popularity across a wide range of applications and market sectors. TLM Laser offers a range of laser cleaning systems as UK and Ireland distributors for 4Jet Technologies.

Recently launched and now complementing the current 200 W and 500 W variants is the new M100 hand-held unit. Based upon a fibre-coupled, maintenance-free solid-state near infrared laser at 1064 Nm wavelength, this compact system delivers 100 W of laser power. Weighing in at less than 5 kg, the hand-held unit is ergonomic in design and optimised for manual use.

Potential applications for this efficient technology are wide and varied and include cleaning of moulds, tools, fixtures, paint and coating removal operations and pre-treatment of surfaces prior to welding, glueing or other coating applications.


**The new 4Jet M100 brings a 100W variant to the range, complementing the current 200 W and 500 W units**

Connected to the portable supply unit by a 5 m cable, the manual unit can easily be manipulated using the two handle configuration. Focal length's range between 160 mm and 420 mm, depending upon lenses, and the 2D integral laser scanning head delivers a 100 mm x 100 mm scan field.

TLM Laser's Tony Dain comments: " This new and enhanced range of hand-held JETLASER variants offer a powerful solution for customers that may have a diverse range of cleaning tasks or low production volumes. We are delighted to have been able to add another exciting product to our broad laser processing portfolio."

This efficient and cost-effective laser cleaning technology is available from Bromsgrove-based TLM Laser, 4Jet Technologies UK and Ireland distributor, and is just part of a comprehensive and growing range of laser based technologies and systems offered by the company.


**M100 hand-held unit**

For further information, contact:

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**Tel: 01527 959099**
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# New sustainable solvent for safety critical cleaning of electronics and electrical components

Solvents are used throughout industries where extremely high performance and safety critical cleaning levels are required including aerospace, military and defence, electronics, semiconductor manufacturing, optics, and industrial machining.

ProSolv®5408e is an innovative contemporary highly effective, versatile defluxer developed to not only remove rosin flux, no-clean flux, oil, grease and wax contaminants, but also to eliminate residual halide salts, ions and other polar and non-polar soils and contaminants that often cause component failures with tracking and other issues impacting performance.

Solvents based on conventional chlorinated hydrocarbons have delivered the high standards required for critical cleaning in the past. These chemicals had desirable properties which when combined gave a profile which was perfect for vapour/vapour liquid degreasing when combined with suitable equipment as industrial cleaning systems.

Non-flammable, consistent azeotropes, low viscosity, high liquid density, very low surface tension and effective wetting enable them to penetrate tight spaces for optimum cleaning performance. High KB values allows for cleaning a variety of light and heavy soils including particulates, ionic soils, oils, waxes, and greases, as these are no longer acceptable.

Evolving legislation for ecodevelopment demanded by governments worldwide demand inventive and original formulations for the use of solvents to continue to comply with the increasingly stringent legislation for protection of the environment and, even more importantly, safety of operators who maybe exposed to the products. In applications where formulated blends of halogenated solvents have been used very effectively in the past these are now required by changes in legislation to be phased out of use.

With 25 years' wealth of experience in this field as the inventors of the highly regarded n propyl bromide (nPB) based EnSolv range of precision cleaning solvents, EnviroTech


Europe created a contemporary new formulation based on recent research and developed a new solvent as a replacement for the "old" technology which has been found to perform just as effectively, but without the negative environmental, health and safety issues.

ProSolv 5408e benefits comprise:

- Short cycle times, increases productivity
- Parts exit the machine cool, dry, and spot-free
- Lower energy consumption
- Excellent cleaning performance, even on complex geometries and tight clearances
- Easy process monitoring with minimal effort and minimal waste generation
- Easy reclamation for reuse
- Compatibility with a wide range of sensitive components (some components or products are sensitive to the high pressures of water cleaning, the heat of washing and/or drying, or surface residues after drying)
- Not classified as a carcinogen
- Very high solvency power, excellent fast precision cleaning

- Mid-range temperature operation, reduced energy use, faster cleaning cycle, easier handling
- Can be used in any vapour degreasing equipment with improved productivity and lower maintenance
- Safe for the environment, zero Global warming (GWP) and zero Ozone depletion potential (ODP)
- Ideal replacement for Trichloroethylene (TCE), and n-Propyl Bromide (nPB)
- Compatibility with a broad range of substrates
- High solvency for a variety of contaminants
- Efficient cleaning in tight to reach places and complex geometries
- No drying required for increased productivity
- Non-flammable


These are just some of the benefits from using ProSolv 5408e, the forever sustainable solvent for cleaning and defluxing in the electronics and electrical components industry and an economical and efficient "drop in "for vapour / vapour liquid cleaning systems using legacy solvents. EnviroTech experts with many years of experience are available to guide you through changeover procedures or to advise on equipment.

All products are supplied and supported by EnviroTech Europe Ltd. They are manufactured in the UK and available on short delivery times through a dedicated team of distributors worldwide.

ProSolv 5408e is not just for cleaning electronics and electrical components. Visit **https://www.vapour-degreasing.com/prosolv5408e/** for information about other applications.

For more information contact:

**Envirotech Europe**
**Tel: 020 8281 6370**
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# Existing blasting machine with improved performance

A steel foundry in Switzerland decided to extensively modernise its overhead conveyor blasting machine. With around 100 employees, Stadler Stahlguss belongs to the Swiss group Stadler Rail, one of the leading suppliers of rail vehicles in Europe. The foundry, based in Biel, generates annual sales of between CHF 24 and 28 million.

60 to 65 percent of these are for orders for the Stadler Group, according to Michael Schmitz, CEO of Stadler Stahlguss.

Other customers come from mechanical and plant engineering for the plastics and food industries, from automotive engineering, energy mechanical engineering and petrochemicals. The framework conditions in Switzerland, a high-wage country, are not easy. So there are just two steel foundries. "We have a unique selling point in terms of component size and tonnage," says Michael Schmitz.

Stadler Stahlguss is thrives in the international market with a high delivery performance, very demanding cast parts and high quality. All components pass through the blasting machine. They have unit weights of 3 kg to 10 t.

Stadler Stahlguss recently installed the existing blasting machine from an Italian manufacturer modified by AGTOS, the blasting machine manufacturer from Emsdetten, Germany. "The surfaces of the castings were not 100 percent clean, the scale layers too firm. This has resulted in high costs for manual regrinding," explains Michael Schmitz as the main reason for the modification. In addition, there were long blasting times: "30 minutes was standard, up to 60 minutes for exotic parts," says the CEO. Today it is normally 12 minutes and the outer surfaces are shiny metallic.

Before the modification, AGTOS checked the blasting machine and discussed the project with Stadler Stahlguss. "A first attempt with an AGTOS competitor did not work at all," reports Michael Schmitz. The turbines of the manufacturer from Emsdetten, on the other hand, deliver the best results: According to the discharge angle, the abrasive hits the workpiece surface more precisely. In addition, they are now better positioned. For the modification, AGTOS not only supplied new high-performance turbines including an adapter frame. Abrasive feed and motors were also replaced. In total, the modification only took three days - practically plug and play, whereby Stadler had already dismantled the old turbines.

**New turbines increase performance of the blasting machine**

The four newly installed turbines are type TA 4.6. The centrifugal wheel has a diameter of 420 mm, as explained by Mario Hintzen, technical manager Service at AGTOS. "The engine output remained the same at 18.5 kW. As a result, we didn't have to change much in the electrical system, except to replace the live circuit breakers," he says. Nevertheless, the performance could be increased by approx. 30 to 35 percent with the new turbines. A new guide sleeve with a smaller but wider window and the merging of the four turbines create a hotspot with significantly higher intensity when blasting. The discharge speed increases due to the larger centrifugal wheels. "The concentration of the blast was the effect that significantly reduced the blasting time," says Mario Hintzen.

"The basic substance of the blasting machine was still very well preserved, so this modification was justified," he continues. On the one hand, this was due to the fact that large blasting chambers are generally not subject to as much wear as small ones, and on the other hand due to the good maintenance status of the machine. "We chose AGTOS because the overall package was right and the project could be realised in a short time, because it only took a good six weeks from the order to the assembly date. That was not possible with the original manufacturer. In addition, it is easier if the communication takes place in such a project in your own language."

View of the overhead conveyor blasting machine modernised by AGTOS

Three new AGTOS high-performance turbines on the modernised overhead conveyor blasting machine

Stadler Stahlguss decided against a new machine because there was no space for a new construction in the halls. An

After the modernisation, the workpieces are blasted cleanly in less than half the time

interruption of operations, except at scheduled times, was not possible. "With 30 percent of the cost of a new investment, we now have a machine that is optimal for our purposes and without a significant production downtime," concludes Michael Schmitz.

AGTOS was founded in 2001 in Emsdetten. Meanwhile, over 160 employees work at the two locations. In Emsdetten, the company's headquarters, the concept is created and the shot blasting machines are constructed. The production facility is located in the Polish town of Konin, near Poznan.

The constant focus on the needs of the customers has made the company a national specialist for the design and manufacture of shot blasting machines for roughening, cleaning, rust removal, descaling and hardening. That is why customers on all five continents work with blasting machines from AGTOS.

In addition to new shot blasting machines, AGTOS also offers used blasting machines. This is advantageous for companies that need a blasting machine at very short notice or who only use it temporarily.

The abrasive used in the shot blasting machines does not only work on the workpiece surfaces. The abrasive effect is also noticeable in the blasting machines. For this reason, service, i.e. stocking and delivery, as well as the installation of spare and wear parts, play an important role. There are also maintenance, repair and modernisation work on machines from other manufacturers. These are always carried out by experienced specialists.

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# Tenova launches hydrogen-ready burner for heat treatment furnaces

Integrated with Industry 4.0 technologies, the new solution from Tenova represents a further step towards the decarbonisation of the metals industry while maintaining NOx emissions well below the strictest future limits.

The leading company in sustainable solutions for the green transition of the metals industry, has announced a key milestone towards a more sustainable combustion process: the development of the first burners for heat treatment furnaces using up to 100 percent hydrogen while keeping NOx emissions largely below the strictest limits.

After the recent launch of the multi-megawatt TSX SmartBurner family for reheating furnaces fueled with a mixture of natural gas and hydrogen (up to 100 percent), the company is now ready to bring onto the market a self-recuperative burner for heat treatment furnaces.

The new 200 kW TRKSX (Tenova Self-ReKuperative Flameless) SmartBurner was successfully tested with a variable fuel mixture of natural gas and hydrogen to potentially eliminate $CO_2$ emissions during the combustion process. The system works in flame and flameless mode with the aim to keep nitrogen dioxide emissions well below the strictest future limits.

"TRKSX SmartBurners preheat the combustion air at high temperature directly into the burner body through the heat-exchanger. This makes it possible to reduce fuel consumption significantly, making this technology extremely efficient (approximately 78 percent). Moreover, it allows to maintain minimum level of NOx emissions, releasing less than 80 mg/Nm$^3$ @ 3 percent of oxygen even with 100 percent hydrogen," explains Davide Astesiano, R&D Manager at Tenova Italimpianti.

The TRKSX SmartBurner was designed in consideration of the decarbonisation goals of the steel industry, and will be first installed in a heat treatment furnace for pipes at the productive site of Tenaris in Dalmine, Italy, a leading global manufacturer and supplier of steel pipe products and related services for the world's energy industry and other industrial applications and part of the Techint Group, to which Tenova also belongs.

"Our target is to enlarge Tenova's burner portfolio to offer our customers the best solution for the decarbonisation of their plants, and we plan to adapt all our burners to be hydrogen-ready. They are also integrated with sensors to make possible dynamic control of waste gases flow, generating precious data for machine learning applications," says Nicola Cavero, senior vice president at Tenova Italimpianti.

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# Guyson blast cabinet hits the target

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

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

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

Merlin Archery's blast system comprises a Guyson Euroblast 7PF blast cabinet, Model 75/16 Cyclone Reclamator, G27 Pressure Pot and Guyson C400 dust collection unit and delivers fast (up to four-times faster than suction fed systems), effective blast finishing on a vast array of components. Large armhole sleeve/glove assembly allows

the operator greater flexibility of movement when blasting and external roof-mounted LED lighting coupled with light coloured rubber curtain lining offers additional cabinet protection and good contrast for parts visibility.

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

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

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

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

Guyson International Ltd is a privately owned family company with a worldwide reputation for excellence in the design and manufacture of blast finishing, spray wash and ultrasonic cleaning equipment. Formed over eighty years ago, the company is registered to ISO 9001:2015 and ISO 45001:2018, with its head office located at Skipton, North Yorkshire, in the North of England. Guyson has four international subsidiary companies: Guyson Corporation of the USA, located in Saratoga Springs, New York State; Guyson SA, situated near Paris, France; Guyson Sdn Bhd in Penang, Malaysia; Guyson CN, in Wuxi, Jiangsu Province, China.

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

**Guyson International Ltd**
**Tel: 01756 799911**
**Email info@guyson.co.uk**
**www.guyson.co.uk**

# ActOn Finishing launches wheel blasting range in UK

ActOn Finishing is launching a new partnership with a high-profile Italian industrial company, Cogeim Europe, as part of its growth plans. The partnership will enable ActOn to supply the wheel blasting technology to the manufacturing sector in UK.

These machines are designed to guarantee reliable operation and a long service life. The wheel blasting technology will offer the possibility to achieve a wide range of finishing applications, including descaling, removal of corrosion or rust, paint stripping, de-flashing, achieving a smooth finish, shot peening, polishing and surface preparation prior to coating

**Wheel blasting technology**

The ActOn offering includes a wide range of wheel blast machines to meet our customers' requirements. This blast equipment is designed for end users who require rapid, repeatable and efficient blasting results, a process free of interruption and a shot blasting machine with a solid construction. Moreove all components are assembled, according to ISO-certification, to create a compact turnkey unit.

The new wheel blast range includes:

- Spinner Hanger Blast Machine, designed to shot blast components of all sizes and/or fragile parts. Some of the most common applications include: paint stripping, descaling, de-sanding castings, deburring and cleaning aluminium pressure diecastings, shot peening, removal of rust and blast cleaning.
- Tumble Rubber / Steel Belt Blast Machines, ideal to shot blast batches of small or medium parts and fragile components. Any type of material can be processed in these machines, from forged and heat-treated components, to steel, aluminium and brass parts and fragile plastic parts.
- Wire Mesh Belt Blast Machine, built for a continuous shot blasting process of aluminium and steel parts. These machines are also perfect for processing components slots and wholes which are difficult to reach, such as gears, diecastings, castings, gearboxes or forged parts.
- Continuous Feed Overhead Rail Blast Machine, used for treatment of components hanged on a hook which run on a O-ring motorised overhead rail. This shot blasting equipment is widely used by steel, cast iron and aluminium foundries for the surface cleaning of metallic products.
- Roller Conveyor Shot Blasting Machines, designed to process metal sheets or plates, profiles and metallic structures and any other long or/ and flat component, in a continuous feed process.
- Continuous Feed Tube & Bar Blast Machines, built to be a continuous feed shot blasting machine for pipes, bottles, cylindrical parts, round bars, torsion bars, gas cylinders and drill rods. Can be easily integrated into existing production lines.
- Rotary Table Blast Machine, a compact range, which requires minimum space, suitable for shot blasting small and medium parts. It is a self-contained piece of equipment suitable for applications such as paint stripping, corrosion, rust and heat scale removal, deburing, de-flashing, cleaning and surface texturing.

- Tunnel Concrete Shot Blasting Machine, designed for surface treatment of marble, granite, natural stone, concrete and aggregate blocks to obtain a bush-hammered, flame treated, antique appearance finishing.

**ActOn Finishing Ltd Tel: 024 76 466914**
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