PGX upgraded to 5DX standard
New P-axis provides support
YG-1 and ANCA go forward
TapX - one machine, one set-up
Profile blade software unmasked
Lights out operation at Melin Tool
UGS NXCAM slashes tool design time
Achieve up to 30% Grinding Cost Savings with Univel G-Force Superabrasive Wheels

Univel G-Force superabrasive wheels have been field proven to reduce total grinding cost up to 30% over the current high-performance wheels by reducing cycle times and wheel-dressing requirements on CNC grinders.

On carbide and steel tools (Rc>40), Univel G-Force wheels generate:
- High metal-removal rates to dramatically reduce cycle times
- Extended wheel life through much lower reconditioning needs
- Low power requirements to eliminate burning and burrs in sensitive applications
- Reduced residual stress after grinding
- Consistent grinding performance throughout the life of the wheel
- Longer life and form retention

For the name of a local distributor or to learn more about Univel G-Force wheels or any other of our cost-saving abrasive products and solutions, visit us on line at www.ind.nortonabrasives.com or email us at ContactSGA@saint-gobain.com.
The theme of growth, expansion and change has continued at ANCA, and with a number of exciting new products, innovative options, capital investments and overseas offices, the pace is quickening. As always the major focus of these changes is our commitment to provide better service and support for our rapidly growing customer and machine base around the world.

Following extensive discussions with a number of customers, we have recently developed a number of new and innovative products including the much awaited P-Axis, and the highly desirable wheel exchanger, which even further enhances the flexibility of ANCA machines. We have added additional enhancements to the TapX machine to further revolutionize the traditional tap manufacturing process, and have also introduced a very comprehensive upgrade to our PGX punch grinding machine.

As the rate of change in the global manufacturing landscape continues to quicken – technologically and geographically – it becomes even more important for ANCA to stay closely aligned with our customers as they support their customers.

As our global customer base grows and moves, we are continually evaluating how to more effectively and efficiently service and support customers and agents locally, in both existing and in new markets. We have significantly grown our staff in China and, to add to the five new offices opened in 2005 and 2006, ANCA has just opened an office in Israel. Like all ANCA offices globally, it too is staffed by highly-skilled and experienced applications and service engineers.

ANCA remains firmly committed to working closely with customers around the world and providing world-class support. In this fast changing world, communication is becoming ever more critical, so I hope you enjoy reading this edition of *The Sharp Edge* featuring some of our latest products and services. For information on additional ANCA products or technologies, please contact an ANCA office or agent near you.

Linsey Siede
Group General Manager

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EMO Hannover
17-22.9.2007
Hall 6 Stand F13
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A NCA engineers have put the PGX punch grinder through a makeover that has brought the machine up to current technology standards. Now called the PGX+, it uses the latest ANCA 5DX CNC system rather than the older 3DX. This unique CNC provides greater dynamic performance resulting in higher precision, better accuracy and superior control. The 5DX CNC system also includes:

- 15" Touch screen
- USB Support
- Inbuilt Modem
- Uninterruptible power supply (UPS)
- CD read/write DVD read.

The look of the PGX+ has changed significantly. The machine has a taller canopy guard to accommodate a new Fanuc robot automation option. The robot is positioned behind the workhead and loads parts from a pallet located beside the machine over the top of the headstock into the work holding fixture.

Designed specifically for punch grinding applications, the PGX+ is capable of grinding round, eccentric and step punches up to 150 mm (6") in diameter. The PGX+ is not limited to punch grinding applications only, but is suitable for grinding any non-round parts such as orthopedic implants also.

PGX+ can use wheels from Ø560 mm (22") up to Ø762 mm (30"). The large diameter wheel powered by a 22 kW (30 HP) direct-drive spindle results in very high metal removal rates with less wheel wear and minimal dressing.

The wheel spindle is directly programmable for speeds from 200 to 3000 RPM. The high RPM gives the PGX+ the speed required for grinding using super-abrasive wheels. The capacity to use super-abrasive grinding technology opens doors to increased performance and productivity.

Accessories on the PGX+ include fully automatic wheel balancing unit, probe, motorized dresser, linear scales, tailstock and coolant delivery options.

Investment in the new PGX+ is another example of ANCA’s commitment to our customers by delivering the latest technology and all the advantages that it brings.

A robust wheel changing system on the PGX+ makes changing large and heavy wheels much easier.
Put simply, lower production costs demand increased material removal rates (MRR). In other words, this means deeper cuts at faster feed rates. SlipNaxos, a sister company of the Winterthur Technology Group, offers a solution called NaxoFlute.

In solid tungsten carbide, NaxoFlute achieves material removal rates also called Q-primes (Qw') of 8 to 10 mm³/mm/sec and higher. To calculate Qw' multiply your depth of cut ae (mm) by the feed rate vw (mm/min) and divide the result by 60.

For example:

Depth of cut ae = 2 mm
Feed rate vw = 300 mm/min
MRR (Qw') = 2 x 300 = 10 mm³/mm/sec

NaxoFlute wheels feature a metal-ceramic bond that works best at high loads and fast metal removal rates. The latest generation has an even higher porosity that adds more aggressive cutting capacity at extended dressing cycles. Its bond, called MH3C and MH4C, is similar to that of vitrified bonds but gives a much longer tool life.

These metal-hybrid bonded diamond wheels can be easily dressed with silicon carbide wheels or even crushed dressed. With CBN, rotary dressers are ideal.

Some solid carbide or HSS tools demand the highest surface finishes possible. To cater to these needs, NaxoPolish wheels are used in secondary operation. They come with diamond or CBN grit sizes between 10 and 30 microns and work best at the same size depth of cut. These wheels can also be used for micro cutting tools with a depth of cut up to 0.7 mm per pass.

For further information, please visit our web site and contact SlipNaxos, Sweden, or Winterthur, Switzerland, or one of the sister companies or our local representative!
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www.winterthurtechnology.com
productivity
the automatic way

The Sharp Edge sent David Arnesen to Cleveland to find out how Melin Tool has used ANCA machines to help triple their sales volume.

Being competitive in the tool market is not just a matter of lowering your sell price, it’s also a matter of lowering your costs. That means longer manufacturing runs and an ability to operate lights-out. This is known only too well at Melin Tool in Ohio, where company President Mike Wochna uses the capability of his ANCA grinders to great effect.

Founded in 1940, Melin Tool remains one of the few family-owned manufacturers of high-quality cobalt, HSS and carbide endmills in the USA. It has concentrated on producing mostly endmills; about 5000 different parts plus the occasional special. One hundred percent of production is sold to distributors who in turn sell to the tool and die, aerospace, automotive and general machining industries.

Melin customers expect a consistent product - the same tool and quality - every time they order. And they expect orders to be turned around quickly. That’s where Melin’s ANCA grinders come in.

The company bought its first ANCA about 12 years ago and now has 17. They have become increasingly automated.

“The biggest change we have seen in the last few years is in the unattended production side of our business,” Wochna says. “Over the past 10 years employment at Melin has grown to 55 from 45, but with our push to automated production we’ve tripled our sales volume in that time.

“We run two shifts a day. At the end of the second shift there is a four-hour period that is unattended when we run lights-out production every night. Over the weekend, we come pretty close to running the TX7+ machines non-stop using the autoloaders.”

The autoloader on the TX7+ enables Melin to run ½” to ¾” tools in sufficient quantities lights-out without a hitch. Each loader pallet holds more than 200 tools.
When *The Sharp Edge* visited Melin, the shop was in the middle of its largest ever single run. It was using two TX7+ for what was expected to be a 22-day run to produce a 13,000-piece lot of carbide endmills. Thanks to the power of the ANCA's, Melin was able to optimize the grinding at 2200 RPM wheel speed. The tool quality was outstanding.

**White-sticking**

ANCA's continual product development has provided significant benefits for Melin. Like the incorporation of ANCA's white-sticking software package within the grinding program. Used to open up the wheels, especially when grinding larger tools, white-sticking at Melin had been a manual operation.

"Having the white stick as part of the TX7+ grinding programs improved our throughput by about 30% on average. Now our guys come in twice on the weekend to reload the pallets because the parts are done so quickly," Wochna said.

Also within the program is automatic wheel size compensation.

"We know pretty well what our wheel wear rates will be like, so we adjust for them automatically at predetermined intervals."

These two features allow Melin to run a large amount of tools unattended with virtually no scrap.

"That's the big thing for us," Wochna said. "It makes us very competitive on any size order. We don't run the autoloaders just on high volume jobs overnight, but every day on every tool we can whether we are in the building or not. Even the fastest operator cannot be as efficient as the autoloaders. When we set-up the machine, we set-up the autoloader at the same time.

"We get much more consistent results, and the machines never stop."

A machine that keeps running keeps producing, and that leads to higher productivity and lower costs.

"We get more consistent results, and the machines never stop."

Twelve years after they bought their first ANCA CNC grinder, Melin Tool now has 17 machines. Their collection reads like a history of ANCA machines and includes MG7s, MGXs, TG7s, RGXs, TGXs, and TX7s. Constant expansion to meet increased sales volume has driven Melin to add new machines regularly.
Recent technological developments are streamlining the CNC production of round cutting tools such as drills and end mills. Central to the improved quality of workpieces and increased production throughput are recently-developed Univel G-Force superabrasive grinding wheels.

Historically, resin and metal bond superabrasive wheels have been so difficult to true (make round); it was considered not technically or economically feasible to true them on the grinding machine. The new hybrid wheels have self-dressing, wear-resistant bonds that in many cases require no to very little stick dressing. Compared to conventional, vitrified CBN and vitrified diamond grinding wheels, the new hybrid wheels all decrease downtime in operations whether dressing is done off-line, on-line or not at all.

Benefits of using hybrid wheels with patented grain-locking bond

In actual production runs regardless of the type of dressing and trueing used, in CNC round tool production of micro-to-large-diameter workpieces, compared with competitive products, G-Force hybrid wheels have exhibited outstanding performance characteristics. These include high metal removal rates, significantly reduced cycle times, lower reconditioning requirements, higher quality finishes, longer wheel life, more parts per wheel and lower overall cost per tool produced.

For example, in a flute grinding operation on a 6.0 mm (diameter), two-flute, high performance tungsten carbide drills using an 11 HP ANCA MGX machine. The G-Force wheel was trued on line with a MaxTORQ dressing spindle and BPR diamond roll. The G-Force wheel was not stick dressed after being trued. Grinding 0.079-inch deep flutes in single passes at 12 inches per minute and a wheel speed of 6,000 surface feet per minute, cycle time was cut by one-third, and parts per re-stick was doubled compared to the performance of the wheel previously used.
ANCA’s new traveling steady is providing extra support for manufacturers of long tools. Greg Perry reports.

The optimum place to support a tool being ground is at the point of greatest load, which is directly under the grinding wheel. A conventional stationary support steady provides sufficient support on a short tool, but when you are manufacturing tools such as drills up to lengths of 400 mm long, a stationary support will not provide the continual support along the entire length of the tool.

On past machines such as the TGX and the TG7, ANCA provided a traveling steady for manufacturing long drills. This technology has now been enhanced and adopted for use on the TX7+ universal CNC grinder.

The traveling steady provides the machine with an additional axis (P-axis) which, under CNC control, keeps the tool support directly underneath the point of grinding at all times. Keeping support under the wheel means heavy fluting operations on long slender tools is a reality.

In addition to providing support for fluting operations the steady can be positioned at the end of the tool to give optimum support during end face grinding operations.

The TX7+ traveling steady is available in two models. Both use the same fundamental drive and machine mount system with the difference being the method of tool support when grinding.

The bush support version uses a circular bush to encapsulate the tool during grinding. The bush is open at the top which exposes the top 45% of the tool for grinding wheel access. Using the bush is simple to set up and change between tool types. It also has the added feature of mounting a centre and being used as a tailstock.

The second variant available is the hydraulic support steady. This steady consists of an off-the-shelf Arobotech hydraulic steady unit which provides three points of support to the tool. Each support applies continual pressure to the tool even for reducing diameters as is the case on tools with a back taper.

Specifications
Max. flute length: 350 mm
Min. diameter:
Bush system: Ø2 mm
Hydraulic system: Ø3 mm
Maximum diameter:
Bush system: Ø26 mm
Hydraulic system: Ø26 mm

A 3D model of the Arobotech hydraulic traveling steady, which provides three points of support to the tool being ground.
Korean tool manufacturer YG-1 has gone from strength to strength and is still growing. According to CEO Hokeun Song, their partnership with ANCA has been one of the driving forces.

The continued growth witnessed in Asia over recent years has been nothing short of miraculous. In the 70s and 80s it was in Japan, and over the last five to 10 years it has been China in the spotlight.

Korea is another Asian economy that has also experienced tremendous growth in its manufacturing capability. Companies such as Kia, Hyundai, Samsung and LG have led the charge of Korean exports, but this growth has not been confined to consumer products only.

Driven by the vision of its CEO Hokeun Song, tool manufacturer YG-1 has also grown to become one of the major players in the global cutting-tool industry and ANCA is proud to have played a major role in assisting YG-1 achieve their goals.

Today, YG-1 ranks as one of ANCA’s largest global customers.

Based in the city of Incheon, near Korea’s capital Seoul, YG-1 commenced operations in 1981 producing endmills that were targeted at the US market. They purchased their first ANCA machines in 1997: six RGX grinders. With such a heavy investment for a first-off purchase of ANCA machines, it was clear from the outset that YG-1 had ambitious plans for growth. Today, with annual sales in excess of $US250 million and 2000 employees supporting their customers around the world, YG-1’s aggressive growth plans have come to fruition.

“ANCA has been one of the most important partners of ours for more than a decade”, explains Mr Song, “starting with the six machines for rotary burrs in 1997 and further subsequent orders over the years for standard and special tool production.

Most recently and over the last 12 months we have signed two contracts with ANCA for 30 machines to expand our capacity in the standard drill market. We are sure that we would never have achieved as much as we have without the support of ANCA.”

As YG-1 has sought to achieve its growth targets with an expanded product range, it has repeatedly teamed up with ANCA to achieve this. This is testament not only to the inherent flexibility of ANCA’s machines and software, but also to the co-operative relationship that exists between ANCA and YG-1.
As well as producing standard cutting tools with ANCA’s machines, YG-1’s commitment to development of its own unique cutting-tool range has seen close co-operation with ANCA to develop special software cycles and machines.

Of particular success were YG-1’s moves into the spade drills market. Engineers from ANCA and YG-1 worked closely together to develop a complete software and special machine package tailored to YG-1’s demanding needs. This project delivered software to YG-1 that offered not only flexibility to deliver a new range of spade drill inserts, but also enabled them to incorporate specific design features that were requested by their own R&D engineers. The success of the project gave YG-1 an edge in the market.

YG-1’s faith in ANCA was confirmed when an order for 30 machines over a 12-month period was awarded to ANCA, the delivery schedule of which extends into 2008. The new grinders will be used to produce standard products as well as special cutters, proving the value of the ANCA machines as versatile production platforms.

With ambitious plans for continued expansion, it is clear that the energy and drive of Mr Song will continue to see YG-1 and ANCA acting as partners well into the future.

“YG Group is now well into the next phase of its growth and development. The way to the top is clear. YG’s people, and the continued development of ANCA, its products and technology, all of which are the key factors to the YG success. They are the basis of the group’s legendary achievements and they will continue to provide the way to the success in the future.”

And as YG-1 continues to grow, ANCA will be there to support them every step of the way.

YG-1 has repeatedly teamed up with ANCA to achieve growth targets with an expanded product range.

"We are sure that we would never have achieved as much as we have without the support of ANCA."

CEO Hokeun Song: the man who’s vision has driven YG-1 to legendary achievements.

YG-1 has repeatedly teamed up with ANCA to achieve growth targets with an expanded product range.
ANCA’s TapX CNC tap grinding machine continues to successfully challenge existing tap grinding technologies in an industry where change has been slow to adapt to market trends.

The TapX concept was conceived from a growing need within the tap manufacturing industry to produce small batch quantities economically and with ever-shortening lead times. The TapX “one-machine, one-setup” approach revolutionizes the tap grinding process by providing a complete solution combining design and manufacture using one machine and one suite of software.

With over four years of continual development, the advantages provided by the TapX manufacturing solution stand unparalleled in the market. Compared to traditional tap grinding methods, the TapX offers a revolutionary level of flexibility and productivity.

So how exactly does the TapX revolutionize the tap grinding industry? The past decade has seen a strong trend towards small batch manufacture of made-to-order taps, with typical batch sizes ranging from five to 100 tools. Traditional tap grinding methods, involving several machines to produce one complete tap, are not ideally suited to small batch manufacturing due to machine set-up and workflow related issues. These factors contribute to long lead times.

The TapX eliminates the need for multiple grinding machines by providing the flexibility to perform all grinding operations on one machine. However, by no means do the benefits stop here. Performing all grinding operations on one machine not only eliminates multiple machine set-up issues, but also enables 3D modelling of the complete tap using the industry-leading ANCA Cim3D software. Off-line verification of tap geometry, grinding moves, and cycle time optimisation can be performed within this environment, using the same software as that used on the machine.

Innovations made within the ANCA CNC control enable the TapX to...
perform high-speed precision thread grinding at roughing speeds up to 600 RPM, and finishing (i.e. with thread relief) up to approximately 220 RPM. Automatic tailstock support and the TapX’s rigid construction ensure superior grinding results, achieving thread-pitch diameter tolerances within 5 microns (0.0002”).

Small batch production requires quick changeover times and this is another key point where the TapX leads the way. Changeover to a prepared job can be accomplished within 15 minutes. With the ability to set-up much of the grinding process off-line, a skilled operator can changeover to a new job within 30-45 minutes.

Designing special tap geometry is eased by the power and flexibility of the iTap software and complemented by the wealth of dressing possibilities. Equipped with two dressing spindles, the TapX ensures all dressing requirements are met. Dressing profile flute forms and single or multi-rib thread grinding wheels is also easily achieved using the ANCA dressing software.

Tap manufacturers are able to produce a vast range of special and standard taps, ranging from M3 up to M150 taps, using the TapX process. Forming taps are effortlessly designed using the in-built forming tap template, 2D design editor, or alternatively by importing custom profiles using the DXF import feature.

Continual product development is essential to keep ahead of any potential competition. In this respect, the ANCA TapX is an evolving product. ANCA engineers are continually developing new enhancements to improve the TapX process in areas such as software, coolant delivery, dressing technology and tooling. New TapX machines will soon feature a specially-developed CNC tailstock that improves the process further by adding features such as programmable tailstock force and improved adjustment. The new CNC tailstock extends the maximum tool length to approximately 260 mm (10.2”) as well as providing for more rigid and ergonomic placement of the dedicated threading dresser unit.

The TapX has the unique position of being unchallenged in the small batch tap manufacturing market and is yet another example of ANCA leading the way through innovation.

"The TapX eliminates the need for multiple grinding machines by providing the flexibility to perform all grinding operations on one machine."
ANCA CNC grinders are now being used to manufacture pinion gears for automotive steering systems. As Duncan Thompson reports, the solution was a combination of several factors.

ANCA has broken new ground in the automotive industry by working closely with parts suppliers to deliver a production grinding solution for manufacturing steering pinion shafts.

ANCA’s unique solution for this application means two manufacturing processes that would previously have been done on separate machines – pinion gear grind and bearing journal cylindrical grind – are now being performed in a single setup on the industry-proven ANCA TX7+ CNC grinder. This delivers benefits in improved part accuracy, reduced cycle times and parts handling, not to mention reduced capital investment.

The success of this project was attributed to a range of ANCA technologies working in unison; in some cases extending their development for this particular application.

**TX7+ Grinder**

With its high-speed headstock, in-process dressing, automatic tailstock and automated loading systems, the TX7+ was the perfect platform for such a complex grinding task. Its versatility enabled ANCA engineers to use a series of technologies in meeting the customer’s stringent needs.

**iFlute**

ANCA’s iFlute software was integral to the success of this project. Typically, iFlute is used to calculate required wheel geometries for a desired flute shape. For this application it was further developed specifically for the task of pinion grinding. Now, iFlute is capable of calculating required wheel geometries for a desired flute shape.

ANCA’s pinion gear solution is producing gears to DIN Class 7 or better, which comfortably meets the customer’s specifications.
shapes for parametrically-defined involute gear forms.

Additionally, this software is now incorporated into the machines’ in-process dressing cycles. This means that as successive dressing cycles reduce wheel diameter, the wheel form is automatically recalculated and updated to ensure a consistent involute gear profile.

Grinding Wheels
Given that many thousands or even millions of parts may need to be manufactured, automotive production always requires a high level of optimisation of processes and cycle times. ANCA worked closely with grinding wheel suppliers to find the optimum wheel technology for the job.

Vitrified CBN wheels were used as they could be dressed and held-up under the demanding flute-grinding process that was being performed.

The same types of wheels were used for the second process: bearing journal OD grinding. It was the ability to do this in the same set-up as the gear grind that made the ANCA offer so appealing.

High-speed Headstock
Using the direct-drive high-speed headstock, the part would be rotated while two wheels mounted on the same spindle would cylindrically grind both bearing journals simultaneously. Using this method, the size of each journal relative to the other could be consistently maintained.

Top of the Class
The results of this development work have delivered a step-change improvement for production of helical pinion shafts. Ultimately this has been proven by the accuracy results that have been achieved. Measurement of key features of the helical pinion section such as profile form, lead and index, as well as bearing journal OD and concentricity relative to the helical pinion gear section, showed the ANCA process was grinding these parts for mass production at DIN Class 7 or better, comfortably meeting the customer’s expectations.

While this process is now proven and TX7+ machines are in active production of pinion shafts, work will be ongoing to further optimise the process cycle time and deliver further benefits to the customer.
**ANCA's phenomenal growth brought new challenges to the manufacturing team.** There was no question that new investment would be needed, but the money had to be spent wisely on machines that could keep up with the pace.

Good management policy dictates that when your company experiences rapid growth, you will need to make sure your manufacturing capacity can keep up. If not, your company won’t be able to satisfy your customers’ demands.

With demand for ANCA’s range of CNC grinders growing by 30% every year over the past four years, the company developed a competitive strategy that meant significant investment in new manufacturing equipment. But just buying new machines wasn’t going to be enough. As Value Chain Manager John Connolly explains, they had to be the right machines.

“The increase in ANCA’s market share caused us to re-focus on the value chain and what we needed to develop to keep up with the growth. We identified shortfalls in the machine shop, particularly in our roughing and finishing capacities. That led us to looking at buying new equipment.

“We wanted machines that could produce large components like the saddles and columns faster and more accurately than the machinery we were using. If we can make the parts more accurate in the beginning, it saves fitting time further down the line.”

During a fact-finding mission overseas, ANCA directors Pat Boland and Pat McCluskey found that there were only two manufacturers in the world that make machines of the quality ANCA needed. One was the Japanese company Yasda and the other was Swiss manufacturer Dixi.

Teams from ANCA visited both companies and were impressed with the quality and precision with which the machines were built. ANCA subsequently bought two Yasda H40 machining centres, which were installed in 2005, and a Dixi 350 and a Dixi DHP 80, which were added to the Bayswater plant in 2007. Together, they added new dimensions to the roughing and finishing processes at the Bayswater plant.

“The advantages of the new machines are higher output, quicker manufacturing times and superb quality,” says Connolly. “They operate in air conditioned rooms set to 23 degrees. The parts go in there and sit for a day or so to normalise the temperature and then they are machined. In terms of productivity, the Dixies are producing parts in half the time.
“The DHP 80 will allow us to phase out some old machines that are less accurate and less productive. Our operators will be able to develop new skills with new equipment. We had to double the power supply to the factory, which meant a new substation, and doubled the compressed air to the site. We have built new rooms and bought specialists out from Dixi to train our people. It has been a huge change.”

At the same time, ANCA acquired a new Voumard internal grinding centre, which brought the total investment to over $A6 million. The new Voumard has also made a huge difference. Says Connolly: “The benefits of the Voumard are higher productivity, higher accuracy and we don’t need to have a person standing there watching it once the job’s set up. It’s a four-turret head so we can have four grinding wheels set up so it’s much more versatile.”

With all the new machines now operating, the benefits of increased productivity and higher levels of accuracy are expected to flow on to the customer in the immediate future. But with ANCA’s growth predicted to continue, even more new equipment will be needed.

“If you take a look at ANCA over the past four years there’s been a substantial improvement in output every year,” says Connolly. “We have some further machines that we’re looking at buying in the next 12 months, which will also help us to step up to the next level.

“As we increase the technology, we are able to step-up our production output, which means we have to employ more people. Every year we’ve grown the workforce within ANCA over the past four years.”

ANCA has already made the next step, by placing an order for a Mori Seiki Flexible Machining System (FMS). The FMS, which is due to arrive in January 2008, will consist of three NH6300 DCG machining centres and a 32-station pallet changing system.

With space at the Bayswater plant already at a premium, ANCA has acquired attached land to construct a new building to house the FMS.
the winds of exchange

The TX7+Xchanger is the latest addition to the ANCA machine range, and it is causing quite a stir right around the world. Based on the highly successful TX7+, it has the added advantage of a multi wheel exchanger. The wheel exchanger expands the current TX7+ two-wheel pack configuration to a capacity of 16 packs, including coolant manifolds.

Having over 30 years of experience in the CNC tool and cutter grinder industry, ANCA has watched and responded to market needs. Ten years ago you may have questioned why a machine would require two wheel packs let alone 16. With the ongoing focus on lean manufacturing, companies are continually looking at ways to increase production and reduce manufacturing costs.

Lights-out production is a phrase that brings a smile to any company owner’s face as production is no longer limited to the company operating hours. Greater access to more wheels with the TX7+Xchanger has meant that longer unattended production runs are possible. Dedicated sets of wheels for roughing and finishing complimented with high capacity automation options provides improved wheel life and facilitates longer production runs while still maintaining quality and consistency of the finished tool.

Single-clamping manufacture is a significant advantage in reducing manufacturing times and ensuring highly accurate parts. In the past, multiple grinding operations were limited to the maximum number of wheels that could be mounted on the machine. With the Xchanger’s 16 wheel packs holding a possible four wheels each, operators now have a selection of up to 64 wheels! It goes without saying that operations limited by wheel quantity are no longer an issue on the TX7+Xchanger.

Coolant delivery plays a critical part in producing a quality product in the least amount of time. The Xchanger loads both wheel packs and coolant pipes simultaneously allowing each wheel pack to have its own dedicated coolant pipe setup.

Lights-out production is a phrase that brings a smile to any company owner’s face as production is no longer limited to the company operating hours. Greater access to more wheels with the TX7+Xchanger has meant that longer unattended production runs are possible. Dedicated sets of wheels for roughing and finishing complimented with high capacity automation options provides improved wheel life and facilitates longer production runs while still maintaining quality and consistency of the finished tool.

Single-clamping manufacture is a significant advantage in reducing manufacturing times and ensuring highly accurate parts. In the past, multiple grinding operations were limited to the maximum number of wheels that could be mounted on the machine. With the Xchanger’s 16 wheel packs holding a possible four wheels each, operators now have a selection of up to 64 wheels! It goes without saying that operations limited by wheel quantity are no longer an issue on the TX7+Xchanger.

Coolant delivery plays a critical part in producing a quality product in the least amount of time. The Xchanger loads both wheel packs and coolant pipes simultaneously allowing each wheel pack to have its own dedicated coolant pipe setup.
ANCA's flexible profile blade software is adding further versatility to CNC grinders operated by woodworking tool manufacturers.

The ANCA blade grinding software was released in iGrind Version 28 to be used in conjunction with the ANCA WGX machine for woodworking tools. The blades are ground on the centre line of the machine with relevant crank and shear angles entered to suit the cutter body.

The software uses the final profile shape required and will automatically distort the profile to obtain the required cutting shape based on the crank and shear angles.

Two different styles of grinding are recognized by the software. The first is pivot controlled, which enables profiles to be ground with undercuts and the flexibility to generate side and radial clearance angles.

The second is axial relief controlled for grinding deep, narrow profiles, which enables the wheel to pivot without colliding into the opposing face of the profile.

Using a 1A1 wheel, axial relief controlled automatically swaps the grinding point from front to back and allows the operator to input a specific axial relief value.

The blade software guides the user through seven easy steps to create the program, with the final step of 2D animation to verify the profile.

To complete the process Version 6 CIMulator3D has many new features, one of which is the ability to simulate a profile blade and the blade chuck. Simulation works directly from the blade profile grinding page.

It is possible to simulate the three sizes of jaws required for different blade widths. CIM3D for blade profiles also includes collision detection and a cycle-time estimator, both of which save valuable machine time because there is no need to take a machine off the production line for development.

With the ANCA profile blade software, having difficulty grinding complex profile blades is now a thing of the past. Could this be the shape of things to come?
Measuring and testing the cutting edge preparation is of crucial importance, in particular for dry machining or with high-performance tools used in medicine, the aerospace industry, tool and diemaking as well as in the automotive industry.

Specialized edge preparation achieves a measurable improvement in the durability of coatings as well as a basic tool life increase of up to 30%. Another major advantage of edge preparation concerns the cost saving achieved by almost doubling tool life.

In parallel to researching and developing suitable production processes, ZOLLER of Freiberg am Neckar has paid detailed attention to checking and measuring the edge preparation. In response to the wishes of well known tool manufacturers, a testing and measuring process for cutting edge preparation has been developed for the »genius 3« universal measuring machine.

ZOLLER »s.k.p.« enables you to check the shape and size of the cutting edge preparation – fully automatically and without contact.

In this process, the cutting edge and the edge preparation area are evaluated. This involves the existing contour being calculated segment-by-segment via image processing. The visual display takes the form of a 2D and 3D model with 200X zoom (500X optional). The data is output both on the monitor of the »genius 3« measuring machine as well as in the inspection log documentation.

Depending on the machine equipment, ZOLLER »s.k.p.« makes it possible to measure the cutting edge preparation for radii/chamfers between 0.005 mm and 0.015 mm. CNC axes position the swiveling incident light 3D image processing camera automatically. There is no need for the operator to go to the trouble of performing calibration, which also rules out a possible source of errors.

Thanks to ZOLLER »s.k.p.«, it is possible to increase the quality of cutting edge preparation markedly, further optimizing the production process and providing documentation for acceptance by the user.

The »genius 3« universal measuring machine is already a firm feature of the process chain in many grinding and sharpening companies. Five CNC axes, rapid movement speeds, precise linear movement and high serviceability ensure that the required precision is achieved. In combination, these components form the basis for complex, precise and fully automatic measuring procedures on metal cutting tools of all kinds.
The solution for tool manufacturing and re-sharpening

With the 5-axes fully automatic »genius« measuring machine all kinds of tool parameters, angles, radii, dimensions can be measured and inspected for quality assurance. By the push of a button you can print out all results in a measuring report and serve it to your customers as proof of high production quality. All your customers’ requirements will be fulfilled and you will stay ahead of your competition!

With the 3-axes semi-automatic »smarTcheck« tool measuring and inspection machine you will have an increase in productivity of 25% by measuring your tools before re-sharpening. With the swiveling camera you can measure all kinds of parameters and printout reports. The »smarTcheck« delivers all functions of a cutting-edge measuring machine with excellent price performance ratio.
The challenge of improving product quality and turnaround times in the demanding area of orthopedic implant and instrument manufacture has been solved for one British company by ANCA.

Corin Group, one of the world’s leading orthopedic implant manufacturers and a renowned innovator in this field, has recently installed the ANCA TX7+ CNC grinder to machine bone rasps, which are used during the surgical implantation of hip replacement devices. It will also be used to grind knee implants, which surgeons use to treat patients with severe osteoarthritis of the knee.

Corin Medical was founded in 1985, based in Cirencester in the heart of the Cotswolds in south-west England. The company was named after Corinium, the early name for Cirencester, a historic Roman town mentioned in scripts as far back as 150 AD, and now known as “the capital of the Cotswolds.”

Corin Group is committed to providing effective techniques that restore mobility and relieve the pain of osteoarthritis and is particularly focused on providing innovative solutions for restoring quality of life for younger, active patients. Latest generation surgical instruments, together with minimally invasive systems and surgical navigation, support a wide range of orthopedic implants.

With increasing demand for their products from across the world, Corin decided that they had a need for a five-axis CNC grinding machine. After discussing their requirements with several companies, Corin asked Coventry-based ANCA UK to provide a solution for grinding rasps, and machining femoral components for their knee systems, with a view to providing a significant reduction in their current cycle times. The solution was the ANCA TX7+ machine with UGS NXCAM for post-processing output and Cimulator3D for verification.
Steve Bass and Andy Morris from ANCA UK completed two comprehensive demonstrations and showed that the ANCA solution delivered the customer requirements in terms of size tolerance, quality, surface finish and a reduction in cycle time. Corin had previously used a milling operation to produce the rasps with a cycle time of four hours per part. Using the ANCA TX7+ the cycle time was reduced to under an hour with a far superior surface finish.

Corin Operations Manager Richard Hemming explains the effect the TX7+ has had on their production.

“The ANCA machine has reduced our cycle times significantly compared with previous methods and allowed us to reduce our lead times to days from weeks.

“The quality and the surface finish on the bone rasp is excellent, with greater consistency than from previous methods.

“We placed the order with ANCA because the cost, delivery lead time and technical support package all met our requirements. The TX7+ machine has allowed Corin to increase our flexibility and productivity and we can now respond to customer requirements within a matter of days.”

Generating the program in UGS NX CAM took approximately two hours for the rasp shown in the picture on page 22. The time required is largely dependent on the number of teeth and the contour shape. There were 48 teeth to grind which required individual sheet bodies to be modelled to ensure that wheel position and depth would be correct all the way around the contour profile. The model of the fixture was also required to ensure wheel collision would be avoided as the wheel approached this section of the rasp.

ANCA has created several different post-processors that convert the 3D model into a program usable on the ANCA machine. Which one is to be used will depend upon the part geometry. For the most complex parts, a five-axis post can be used, taking advantage of all CNC axes on the TX7+. For the Corin bone rasp, a 2D polar post was used that controls only the Y- and A-axes.

An important enhancement that has been recently added to these posts is the Cutter Radius Compensation (CRC) function.

Previously if there was any change to the grinding wheel dimension, due to wear for example, the whole model had to be put through the post-processor again to generate a new program. The CRC function can now compensate for wheel wear by performing an automatic update to the program.

ANCA is confident that the TX7+ machine will be the first of many at Corin, which will assist growth and help the company to develop their range of orthopedic implants further into the worldwide medical market.

"The ANCA machine has reduced our cycle times significantly compared with previous methods."

The UG program creates a grinding path for the wheel as illustrated by the light blue line below. Once the process was established, ANCA engineers were able to use it as the basis for other rasp projects.
### CNC-Data
ANCA SDX, Pentium 4, min. 512MByte, 15" Touch Screen, Ethernet card, 56kbps modem, CD Read and Write/DVD Read only

### Mechanical axes
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<tr>
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<th>X-axis</th>
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<th>Z-axis</th>
<th>C-axis</th>
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<td>0.0001 mm</td>
<td>0.0001 mm</td>
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<tr>
<td></td>
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<td>0.0000039”</td>
<td>0.0000039”</td>
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<tr>
<td>Programming resolution</td>
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<tr>
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<td>0.0000039”</td>
<td>0.0000039”</td>
<td>0.0000039”</td>
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### Software axes (patented): B, V, U, W (optional P)

### Work piece
Maximum tool diameter / Maximum weight: 202 mm (8") / 25 kg (55lbs)

### Drive system
ANCA Digital (SERCOS standard) / Linear axes direct drive ballscrew / Rotary axes direct drive

### Machine data
Grinding spindle: ANCA Bi-directional 37 kW (49 HP) peak / 10,000 RPM / Integral Direct Drive / BIG Plus BT40
Grinding wheel max. diameter 202mm (8") / Wheel bore: 50.8 mm (2") / 16 wheel packs with max four wheels each

### Other data
<p>| | |</p>
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<tr>
<td>Electrical power</td>
<td>25 KVA</td>
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<tr>
<td>Probe system</td>
<td>Renishaw</td>
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<td>Coolant system</td>
<td>External</td>
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<tr>
<td>Machine base</td>
<td>ANCACRETE (Polymer concrete)</td>
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<tr>
<td>Colour</td>
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<td>Weight</td>
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### Floor plan (including loader)
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ANCA reserves the right to alter or amend specifications without prior notice
### Asia Pacific

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<tr>
<th>Company</th>
<th>City</th>
<th>Country</th>
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<tbody>
<tr>
<td>ANCA Pty Ltd</td>
<td>Melbourne</td>
<td>Australia</td>
<td>+61 3 9751 8200</td>
</tr>
<tr>
<td>ANCA Machine Tool (Shanghai) Co. Ltd</td>
<td>Shanghai</td>
<td>China</td>
<td>+86 21 5868 2940</td>
</tr>
<tr>
<td>ANCA Japan</td>
<td>Nagoya</td>
<td>Japan</td>
<td>+81 561 53 8543</td>
</tr>
<tr>
<td>ANCA Thailand Ltd</td>
<td>Rayong</td>
<td>Thailand</td>
<td>+66 3 895 9262</td>
</tr>
<tr>
<td>Sahamit Machinery</td>
<td>Bangkok</td>
<td>Thailand</td>
<td>+66 2 295 1000</td>
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<tr>
<td>CKB</td>
<td>Hiroshima</td>
<td>Japan</td>
<td>+81 82 227 3211</td>
</tr>
<tr>
<td>Allied Chase</td>
<td>Shanghai</td>
<td>China</td>
<td>+86 21 6284 2166</td>
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<tr>
<td>Leeport (Holdings) Limited</td>
<td>Hong Kong</td>
<td>China</td>
<td>+852 2427 7991</td>
</tr>
<tr>
<td>Lionapex Equipment</td>
<td>Singapore</td>
<td>Singapore</td>
<td>+65 6362 0880</td>
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<tr>
<td>Lionapex Equipment Snd Bhd</td>
<td>Kuala Lumpur</td>
<td>Malaysia</td>
<td>+60 3 6257 2166</td>
</tr>
<tr>
<td>Pulau Pinang</td>
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<td>Malaysia</td>
<td>+60 4 659 3933</td>
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<tr>
<td>Ecowin Corp</td>
<td>Ta-Li City, Taichung</td>
<td>Taiwan</td>
<td>+886 4 2407 4300</td>
</tr>
<tr>
<td>Empire Machine Tools</td>
<td>Mumbai</td>
<td>India</td>
<td>+91 22 2493 7340</td>
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<tr>
<td>SH International</td>
<td>Seoul</td>
<td>South Korea</td>
<td>+82 2 780 1047</td>
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### Europe

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<tr>
<td>ANCA GmbH</td>
<td>Mannheim</td>
<td>Germany</td>
<td>+49 621 338 100</td>
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<tr>
<td>ANCA Italia</td>
<td>Vicenza</td>
<td>Italy</td>
<td>+39 0444 341 642</td>
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<tr>
<td>ANCA (UK) Ltd</td>
<td>Coventry</td>
<td>United Kingdom</td>
<td>+44 24 7644 7000</td>
</tr>
<tr>
<td>ALBA Precision sro</td>
<td>Brno</td>
<td>Czech Republic</td>
<td>+420 548 226 400</td>
</tr>
<tr>
<td>Karel Redig – ANCA</td>
<td>Edegem</td>
<td>Belgium</td>
<td>+32 3448 4165</td>
</tr>
<tr>
<td>Jaime Molar – New Machine</td>
<td>Barcelona</td>
<td>Spain</td>
<td>+34 93 715 03 36</td>
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<tr>
<td>MAVIS VS Impex srl</td>
<td>Craiova-Dolj</td>
<td>Romania</td>
<td>+40 251 410 225</td>
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<tr>
<td>Ravema AB</td>
<td>Varnamo</td>
<td>Sweden</td>
<td>+46 370 488 00</td>
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<td>Ravema AS</td>
<td>Oslo</td>
<td>Norway</td>
<td>+66 85 90 10</td>
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<tr>
<td>Tek Team Ltd</td>
<td>Yahud</td>
<td>Israel</td>
<td>+972 3 632 3576</td>
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<tr>
<td>Tool Man SARL</td>
<td>Veyrier-Geneve</td>
<td>Switzerland</td>
<td>+41 22 690 0405</td>
</tr>
<tr>
<td>ZAO Rosmark Steel</td>
<td>St. Petersburg</td>
<td>Russia</td>
<td>+7 812 336 2727</td>
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### North America

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<tbody>
<tr>
<td>ANCA Inc.</td>
<td>Wixom, MI</td>
<td>USA</td>
<td>+1 248 926 4466</td>
</tr>
<tr>
<td>Automation Solutions</td>
<td>West Chester, PA</td>
<td>USA</td>
<td>+1 610 430 3670</td>
</tr>
<tr>
<td>Beckman Precision Inc.</td>
<td>Greer, SC</td>
<td>USA</td>
<td>+1 864 801 8181</td>
</tr>
<tr>
<td>Dmark Corporation</td>
<td>Cypress, CA</td>
<td>USA</td>
<td>+1 714 897 9010</td>
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<tr>
<td>Innovative Machine Solutions Inc.</td>
<td>Waukesha, WI</td>
<td>USA</td>
<td>+1 262 547 6448</td>
</tr>
<tr>
<td>Joachim Machinery</td>
<td>Indianapolis, IN</td>
<td>USA</td>
<td>+1 317 788 1501</td>
</tr>
<tr>
<td>Koch Machinery Co. Inc.</td>
<td>Houston, TX</td>
<td>USA</td>
<td>+1 281 720 8500</td>
</tr>
<tr>
<td>Machine Tool Marketing Inc.</td>
<td>Tulsa, OK</td>
<td>USA</td>
<td>+1 918 369 7065</td>
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<tr>
<td>Machinery Sales Company</td>
<td>Phoenix, AZ</td>
<td>USA</td>
<td>+1 480 357 2957</td>
</tr>
<tr>
<td>Machines &amp; Methods Inc.</td>
<td>Layton, UT</td>
<td>USA</td>
<td>+1 435 901 0287</td>
</tr>
<tr>
<td>McDaniel Machinery Inc.</td>
<td>Bellevue, WA</td>
<td>USA</td>
<td>+1 425 746 1656</td>
</tr>
<tr>
<td>Metalworking Technologies Limited</td>
<td>Beaverton, OR</td>
<td>USA</td>
<td>+1 503 617 1992</td>
</tr>
<tr>
<td>Modern Tools Inc.</td>
<td>Pelham, AL</td>
<td>USA</td>
<td>+1 205 403 9900</td>
</tr>
<tr>
<td>Productivity Inc.</td>
<td>Arlington Heights, IL</td>
<td>USA</td>
<td>+1 847 434 1440</td>
</tr>
<tr>
<td>Smith Industrial Machine Sales</td>
<td>Stoneham, MA</td>
<td>USA</td>
<td>+1 781 438 3211</td>
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<tr>
<td>SMS Machine Tools</td>
<td>Minneapolis, MN</td>
<td>USA</td>
<td>+1 763 476 8600</td>
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<tr>
<td>Walker Machinery</td>
<td>Cedar Rapids, IA</td>
<td>USA</td>
<td>+1 319 632 4288</td>
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<td></td>
<td>Omaha, NE</td>
<td>USA</td>
<td>+1 402 330 2323</td>
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<td>Rochester, NY</td>
<td>USA</td>
<td>+1 585 738 8323</td>
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<tbody>
<tr>
<td>ANCA do Brasil</td>
<td>São Paulo</td>
<td>Brasil</td>
<td>+55 15 3221 5512</td>
</tr>
</tbody>
</table>
Many wheels make light work

So the more wheels you’ve got, the easier it is. The ANCA TX7+Xchanger has all the power of the TX7+, but it also boasts the most advanced wheel exchanger magazine available for a CNC universal grinder.

Sixteen wheel packs means you can choose from up to 64 wheels with a maximum diameter of 200 mm.

That’s a versatility our competitors struggle to match.

TX7+Xchanger

ANCA®
TOTAL PRECISION

www.anca.com

ANCA Offices
Melbourne, Australia
São Paulo, Brazil
Shanghai, China
Mannheim, Germany
Haifa, Israel
Vicenza, Italy
Nagoya, Japan
Rayong, Thailand
Coventry, UK
Detroit, MI, USA

Precision
Versatility
Productivity
Confidence