COMPLETE

Nr. 01/21

The complete machining magazine

All eyes on:

The MILLTURN Connectivity

Smart. Networked. Future-oriented.
WFL has the solutions for today, tomorrow and the day after tomorrow.

WFL MILLTURN TECHNOLOGIES

Carinthia. It‘s my life!

The mountains are still covered in snow, but down in the valley, nature is coming to life and invites us to pursue outdoor activities. Numerous beautiful paths around the lakes promise cycling pleasure and low elevation hikes get the circulation going. The pure joy of life. By refining regional and seasonal ingredients, Carinthian cuisine spoils its guests with delicious dishes. Respecting nature, promoting sustainability and preserving tradition – this is of utmost importance in Carinthia, Austria's sunny south.

„Any sufficiently advanced technology is indistinguishable from magic.“

Arthur C. Clarke

Dear customers and readers,

WFL connects!

The economic downturn has challenged us repeatedly since the coronavirus pandemic hit the world at the beginning of March 2020. Nevertheless, we are not giving up. We are moving forward, perhaps somewhat restricted, but we strive to return to the previous years' level. Many precautions have been taken at WFL to keep business going while adhering to COVID-19 safety measures. Despite these difficult times, we have produced many innovations and further developments over the last year.

It should stay that way in 2021! The new M20 MILLTURN is the latest addition to the MILLTURN family and at the center of attention. Its straight-lined appearance and modern design make it a very special machine model. A particular highlight is the front of the machine, which is made of hardened, easy-care glass. The M20 MILLTURN is the ideal solution for users who are looking for a powerful turning-boring-milling center. Special features include the high stability of the machine as well as a holistic motor spindle concept, which encompasses practically every machining technology.

Being a very current topic, automation played a major role in developing the M20 MILLTURN. An integrated production cell „intCELL“ enables automatic loading of raw parts and unloading of finished workpieces. Loading of both shaft and chuck parts becomes reality with intCELL.

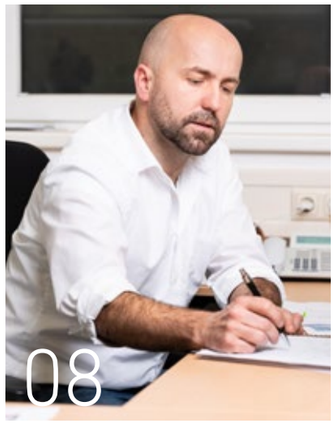
Digitization will continue to accompany us as well. Our digital offer comprises new webinars on various software and technology topics. The implementation of our customer portal myMILLTURN is particularly worth mentioning. WFL's top priority is to intensify the contact with existing customers who, in turn, benefit from features such as myToolFinder, myCapaMax, myAcademy, myCommunity and myMedia.

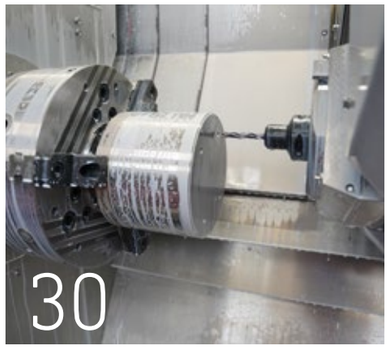
Get ready for a year full of technological, constructive and software highlights relating to the MILLTURN complete machining centers.

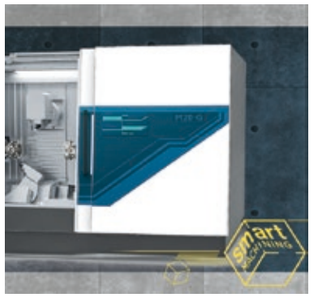
Your WFL Management-Team

Günther Mayr
Managing Director Sales and Technologies

Norbert Jungreithmayr
CEO







VOCATION
Thomas Penz and his team have found their vocation in planning and coordinating system-relevant strategies. The progressive collaboration and team spirit in this department are essential and are driving things forward.

»A system is a whole. Each part is connected with each other in such a way that any change changes the whole...«
Virginia Satir

The Process Engineering Hub

As the saying goes, „All roads lead to Rome." This means all types of connections, paths and options. items, processes and workflows are not the only aspects that the PE (Process Engineering) team deal with at WFL. To keep a system up and running and improve it, the junctions and connecting roads between departments are very important. This is where Thomas Penz, Head of PE and his team come into play. They perform daily feats and problem-solving to skilfully combine pending workflows, coordinate system-relevant processes with the utmost accuracy and continually improve their methodology. The progressive collaboration and team spirit in this department are essential and drive this essential part of WFL forwards.
COMPLETE magazine took a look behind the scenes at the ‚WFL motorway interchange' and met up with Thomas Penz for an interview.

Please tell us a bit about yourself.
My name is Thomas Penz and I grew up in the municipality of Liebenau in the Mühlviertel region of Austria on my parent's farm. The free and easy environment meant that I always had the freedom to make decisions and I started an apprenticeship on September 1, 1993 as a Plant Fitter at VA-Steinel. I'll never forget my first day. All apprentices began their training in the VOEST training workshop. The foreman greeted us with the following words: „Ah,... the Steinel boys,... you're all being sacked." I thought: „Not bad for my first day." His statement proved to be correct. Then, in 1993, WFL was founded. Hence his statement. Although we were still trained by the company MCE, we were able to move seamlessly to WFL in 1997 and begin our working lives. I experienced a lot of different departments at WFL during my apprenticeship, from Pre-Assembly and Main Assembly through to Control Cabinet Construction. I wanted to undertake further general training and sat the Berufsreifeprüfung, which is a vocational higher education entrance examination here in Austria.
In 2002, my colleague Herbert Basting came to me and asked if I was interested in a career change, which would ultimately lead to me moving to work with him in PE Calculation. When a colleague retired in 2007, I was asked to take on the logistics and stocking tasks. Five years later, in 2014, I took over as from Herbert as Head of PE. Since then, I have managed the Process Planning department (later renamed Process Engineering) to the best of my knowledge and belief. It's basically like any motorway interchange; everything converges here. Receipt of order with deadlines, purchasing with delivery times, assembly processes and logistics, of course. You need to have an understanding of the overall picture and, above all, how the relevant work orders can best be linked, including with time management.

What's the best decision you have made in your career?
It was the decision to undergo further training and courses that I got to attend. Also the opportunity to take on a managerial position. This was a very good match for me and I'm glad I chose to do it.

How are day-to-day tasks carried out and projects completed, how do you organise your working day?
In this regard, I am not very bureaucratic at all. I delegate responsibility to my team. My working day begins with a daily briefing, where we look at what needs doing, whether there are any changes or anything new. I try to keep an overview of capacity and agree projects with my team. In this regard, I trust my employees completely. It works very well and everyone is very conscientious in their relevant role. I am very proud of this.

How do you make decisions?
I make decisions according to the best of my knowledge and belief. Information on the order situation, delivery times, processes and planned developments are essential for this. Experience and a gut feeling are essential for the final decision.

How do you handle unusual or stressful issues?
I try to work through them calmly and not get stressed. Of course, there are times when something will annoy you but you try to remain calm in spite of it, find a suitable way to deal with it and solve the problem. You could say: „You can't make an omelette without breaking eggs." WFL works to a high standard and we all produce exceptional work in my opinion.

What would you do if you had 100 million euros, but could only spend it on WFL?
That's a very interesting question... (laughs) I can think of a few things. Money is known to be a limited resource at every company. Perhaps it would be nice to have a second dispatch hall. Or to extend the assembly space to ensure movement-free work, as far as possible. It would also be great to digitalise every installation workstation with an industrial tablet. Some employees have a long commute, so commuter buses would be the next step. With WFL branding for advertising, of course. R&D must not miss out either, and financial provision ought to bring security. All this should make things easier and make people happy.

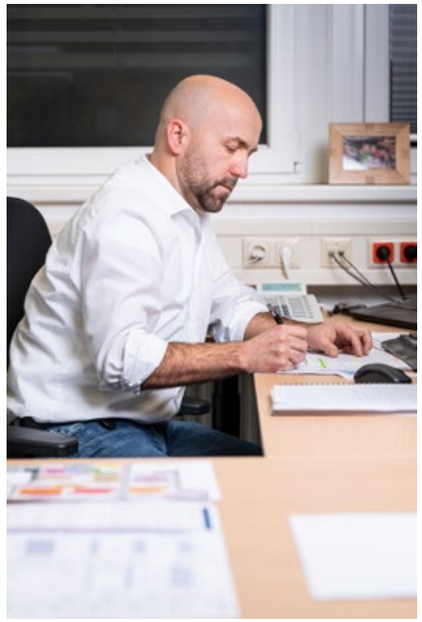
What is your preferred department leadership style?
I favour a cooperative leadership style. I talk about requirements and targets, which I discuss with the team, but I let each employee find their own way. Ultimately, the right results must always be delivered. I trust my team to complete everything that we take on. I am willing to compromise and gladly listen to suggestions from colleagues. This ensures that we continue to improve and help one another. Everyone should develop and be able to flourish in their role.

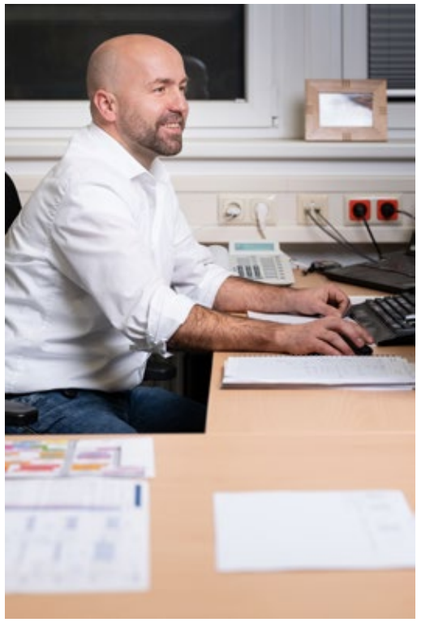
What do you think are the three most important characteristics a leader must have? Do you have these characteristics?
Conscientiousness, honesty, loyalty and motivation. I think these characteristics are very important and I think I do bring these to the table.

> »I trust my employees completely. Everyone is very conscientious in the respective sub-area. I'm proud of that.«

What's your next project?
Last year we worked on a parts list system in conjunction with R&D and the engineering departments. This also contains aspects of pre-assembly so that processes can be completed more quickly and we have plans for process improvement cards. These A5 cards are to be available in each department and anyone can write down suggestions for improvement or ideas. These projects are designed to make everything easier and make processes themselves simpler.

Tell us a bit about yourself, outside of work. How do you ensure a healthy work/life balance?
I bought a house with my family in 2006.





VARIETY
Boredom is unknown here. Everyday challenges are approached with motivation.

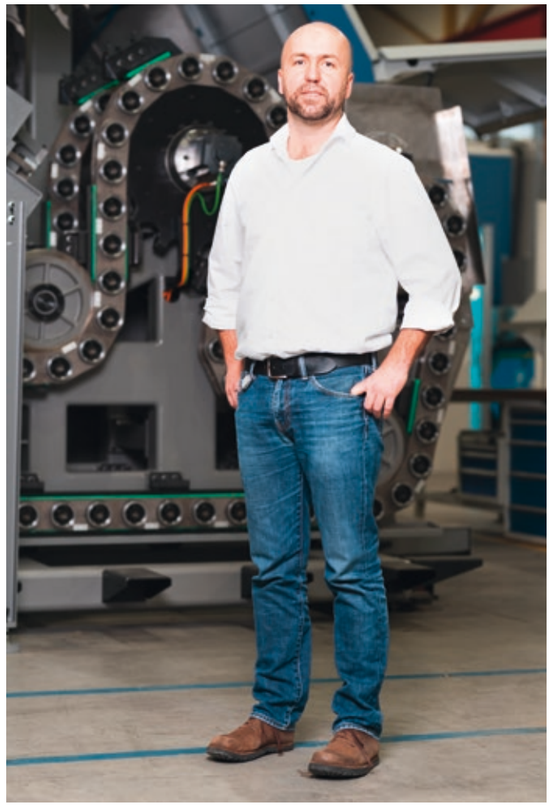
TEAMWORK
A strong team and mutual trust perfect this department.

Since then we've done some work to it and extended it, and have been doing up this cosy home. It's now reached the point where we all like it and it's become what we wanted. I'm also active in the community. We look after our area, maintain the hiking trails, trace out cross-country skiing trails in winter, and in any remaining spare time, I also like to go cycling or quad biking or wedel down snowy slopes in the Salzburg ski resorts. This is what I do to balance out my working life and clear my mind of stressful situations.

What are the most important characteristics for an employee?
Team spirit is very important. It's also crucial that everyone can pull together. Conscientiousness and expertise are also essential in our department. These characteristics are necessary to get ahead and are what makes a professional employee.

What film title would you give to your department or your team?
That would be ‚The Incredibles'. This Pixar/Walt Disney animation is a pretty good description of us. Who takes on which role is less important. It's simply about everyone doing incredible things and working hard each day to produce excellent results.

What are your professional and personal goals? What would you like to have achieved in the next five or ten years?
Career-wise, I am very satisfied, but open to new challenges. I think that I have proved that I work towards a goal and can approach processes with versatility and dedication. A lot can happen in five or ten years. In my private life, I wish for health and happiness, above all else.



PROFILE
Name: Thomas Penz
Age: 43 Jahre
Hometown: Arbesbach, NÖ
Education:
1970 - 1978 Primary and secondary school
1992 - 1993 Pre-vocational school
1993 - 1996 Plant technician VA-Steinel / VA MCE
1996: Austrian Armed Forces
1997: VA MCE
2000: WFL Millturn Technologies

All eyes on…

Automation with multiple chaining

by WFL Millturn Technologies

Four MILLTURN machines are linked with the help of a central automation system. By automatically changing the clamping jaws, tailstock centers and prism tools, the machines and the automation can be operated without setup.

All eyes on

Automation with multiple chaining

by WFL Millturn Technologies

A unique automation project revolves around central automation of four MILLTURN machines. This turnkey system has a whole range of special features. Automatic changeover of jaws, tailstock tips and prismatic tools in conjunction with a servomotor gripper for covering an extremely large product range allows for set-up-free operation of the machines and automation solution.

The system features a fully automatic gripper quick-change system and gripper warehouse. Servo grippers for workpieces up to max. 250 kg are used. Grippers for prismatic tools, tailstock tips as well as inner and outer jaws are also used.

View of tool storage housing

Gripper change in the gripper station

The 6-axis robot with 480 kg payload is mounted on a 7th axis. A range of grippers can be added to and removed from the production process fully automatically. An integrated drip tray collects coolant and chips.

Set-up stations and workpiece measurement

By using two set-up stations for workpieces and tools, tools can be set up and new workpieces can be loaded and unloaded parallel to machining time.

The two diameters at which the grippers hold the workpiece are determined via the two servo parallel grippers with an absolute position measuring system. These two values are compared with the nominal diameters stored in the recipe.

Two stationary laser light barriers determine the length of the workpieces and compare them with the recipe's nominal values. The workpieces' offset value from the robot zero point is also calculated.

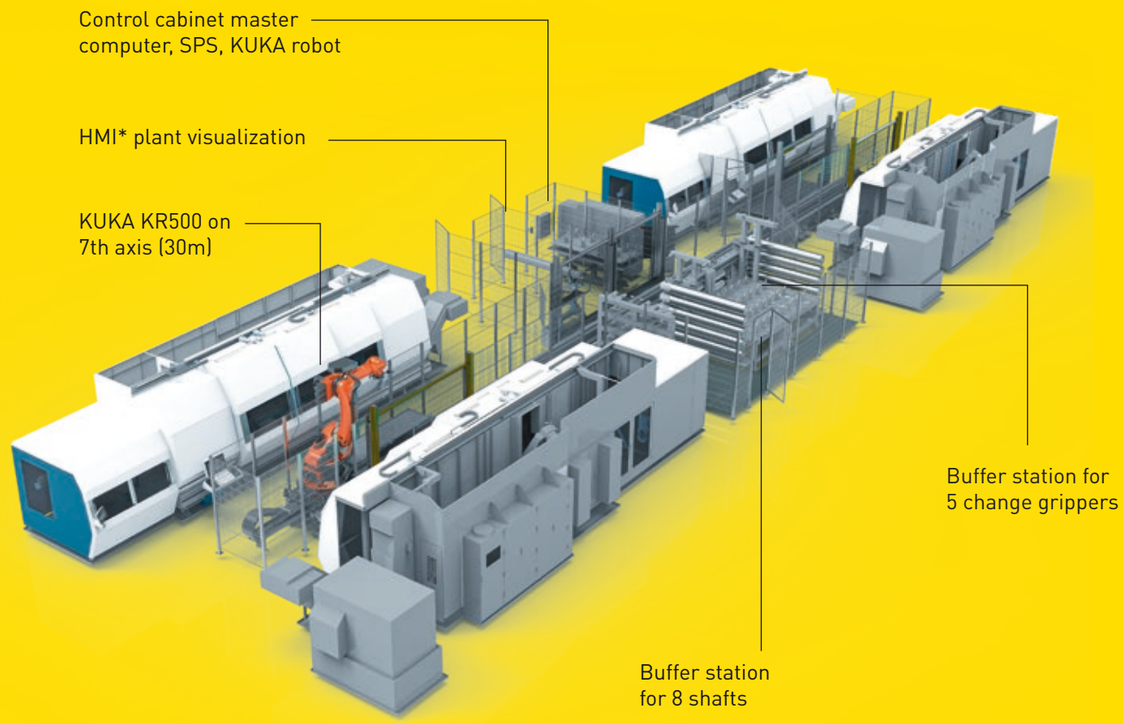
Tool and workpiece set-up station incl. HMI* and barcode scanner

Automatic tool change incl. cleaning and lubrication

A special chuck allows for fully automatic jaw change over (simultaneous replacement of the 3-part sets). The tailstock tips can be changed automatically using a special gripper. Another special gripper is able to automatically change the long prismatic tools (up to 2,500 mm long and 250 kg in weight).

Set-up station from left to right: for prismatic tools, tailstock tips and sets of jaws

Before the new tool is inserted into the machine, the robot moves with the exposed guide to a special station in which the guide is blown off to clean it and then coated with oil. This creates the optimum conditions for a reliable handover process.



Control technology

The system has three control levels:

- KUKA KRC robot controller
- Siemens PLC sequence control, safety technology
- Host computer cell logic & recipe management

A cell host computer manages the CNC programs centrally and makes them available to the machine. Additional information, such as tool management and material flow planning, can optimise machine utilisation times as well as minimise downtimes and also enable autonomous production.

* Human Machine Interface = dashboard that enables users to communicate with machines, computer programs or systems.

Advantages

Set-up-free operation: Use of flexible servo gripper for the workpieces, 5-position gripper station

Warehouse serves as a „lung“: For 20 different sets of jaws, 12 different prismatic tools, 6 different tailstock tips and 8 different shafts (unfinished part, semi-finished part, finished part)

Host computer as the „brain“: The host computer compiles an optimised production program based on the available tools and workpieces so that the system can be operated autonomously overnight or at weekends.

Lower unit costs: Unmanned shifts or unmanned production at the weekend, faster changeover of tools and workpieces and thus greater machine utilisation

Flexibility: On the automation side, through the universal gripper for workpieces, on the machine-side through the 20-position jaw store for different shaft parts, 6 different tailstock tips and 12 special tools in the tool storage housing

Lower machine & tool costs: Central tool store (expensive tools can be used for all four machines), special tool changer for heavy/long tools is only needed once as the automation solution means it covers all machines.

The finishing touches in production

KAPP NILES AT THE SITE IN COBURG
From its inception, Niles has focussed on the development of gear finishing machines and has built up extensive expertise in this area.

Traditional company Kapp Niles has been in existence for more than 120 years. From its inception, Niles focussed on the development of gear finishing machines and has built up extensive expertise in this area. Bernhard Kapp founded "Kapp & Co." in 1953 and the two companies merged to form a Group in 1997. As early as 1980, the portfolio was extended to include the production of grinding tools and since 2017 the company has been producing its own measuring machines. The company will soon be managed by the third generation of Kapps: Michael and Matthias. Kapp Niles has nine production sites throughout the world and the Group employs just under 1000 members of staff.

International presence

Typical Kapp Niles applications are found primarily in the automotive and aviation industries. The larger grinding machines are supplied to the mining, wind energy and rail sectors, among others. Europe and Asia represent its main markets. The company's main products are generating grinding machines, profile grinding machines, measuring machines as well as grinding and dressing tools. These enable the grinding of workpieces with a diameter of 8 to 8,000 mm and a length of up to 2,200 mm. Special machines on which high-precision aviation components and screw rotors are machined represent a large market segment. It is details like these that make Kapp Niles and its machines stand out and are considered the company's unique selling point.

The complete package

"Maximum accuracy and optimum surface quality play a central role at Kapp Niles and are the most important features required of our machines," says Michael Kapp, Production Director for the Group. Strength is a hugely important property when it comes to gear teeth. Once the workpieces have been hardened, they can be ground in the Kapp Niles machines. Reproducibility is another key requirement. Kapp Niles is a system supplier that offers not only grinding machines but also the corresponding tools, technological expertise and coordinate measuring machines, thereby giving its customers real added value.

The company places huge emphasis on service: Kapp Niles covers everything from the overhaul of machines to repairs as well as conventional services, in an effort to increase customer benefits. The motto at Kapp Niles is: The first machine is sold by Sales, the second machine is

DIVERSITY
Hundreds of different components that are installed in Kapp Niles grinding machines are currently being produced on the two MILLTURNs.

sold by the service. The concept of digitalisation is becoming increasingly important, and a new user interface (KN grind) with optimum user-friendliness has been integrated into the new generation of grinding machines. The machines are able to network with one another and feature a closed loop connection to the coordinate measuring machine, which issues correction instructions directly.
Around 450 members of staff are employed at the site in Coburg. Around 60 of those employees work in production over two shifts. In 2014, some of the production at the Coburg site was moved to a large new building, where two MILLTURN complete machining centres were installed. To be more precise, these are two M40-G MILLTURN complete machining centres with a machining length of up to max. 2,200 mm.

Complete machining on the increase

The machine concept of complete machining is not new to Kapp Niles. According to Sascha Forkel, Head of Cubic Machining, this concept was introduced around 15 years ago and has since had a huge impact on production as a whole. Back then, the advantages of complete machining were already clear to see, which is why the company invested in two complete machining centres. These years of experience played a key role when it came to replacement investment. The search was on for a counter spindle machine with tool turret. Based on a market analysis and a detailed investigation into possible suppliers, the company finally opted for WFL. "We chose the machines that made the greatest impression on us in terms of quality, and these were the MILLTURNs from WFL," says Michael Kapp, Production Director at Kapp Niles.

The machines Kapp Niles was using at the time had reached their limits with some machining tasks. With the MILLTURNs from WFL, the full performance potential of the tools can now be fully exploited, including reserves. The machines are currently also achieving the desired quality in hard turning.

Impressive stability, quality and reliability

"When purchasing the machines, our primary concerns were to increase productivity, stability, accuracy, reliability and availability. "We are working on the assumption that we will be using the machines for much longer than 10 years," says Sascha Forkel. The slant bed concept and the compound slide structure of the MILLTURNs from WFL ensure long-term stability and accuracy. Unique to the market is the mechanical turning-boring-milling unit, which boasts unrivalled performance and minimal interfering contour. This structure allows short tools to be used, thereby achieving maximum accuracy and material removal.
Another reason for purchasing the machines was the service that is included. We asked around and received excellent references for WFL. "The longer service life of a MILLTURN in comparison with other complete machining centres was what ultimately convinced us to purchase the machines," continues Sascha Forkel.

The two MILLTURNs are now being used to produce the most diverse range of components for Kapp Niles grinding machines, such as spindles, tool bodies, bearing housings and further machine components. While the previous machines were incapable of carrying out hard turning with the required tolerance, the new machines are now producing reliable results. "In terms of both machining and tools, there is still huge potential," says Michael Kapp.
From commercial and technical aspects, right through to software considerations during order processing, the entire process was watched over by a competent WFL Project Manager. This meant that all issues and concerns could be dealt with quickly, much to Sascha Forkel's delight.

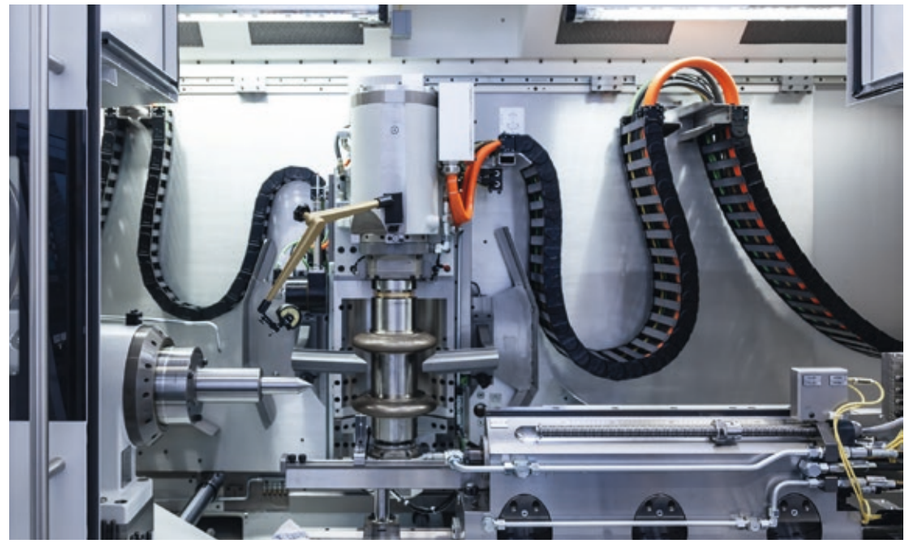
"The MILLTURNs from WFL are the latest machines to arrive at Kapp Niles and will also be the first to be automated. "We can be confident about upgrading these machines in the near future, because as well as receiving everything from a single source, we also feel safe in the knowledge that everything will work as it should," concludes Sascha Forkel.

Uncompromising efficiency

The two M40-G MILLTURN machining centres are used to produce various parts for Kapp Niles grinding machines, including a wide range of flange and shaft parts. They produce workpieces that are particularly rotationally symmetrical. "Many of the components for our machines are machined on the MILLTURNs," says Michael Kapp. The MILLTURNs have also optimised machining times, as the machines are more powerful and ultimately more stable. All programs are currently being rewritten and transferred to the MILLTURNs. The company is hoping to make even further advancements in terms of production efficiency in the near future.

At Kapp Niles, programs are created externally using CAD (Siemens NX). Before the program is transferred to the machine, all processes are documented and simulated. Two employees are currently responsible for programming a wide range of workpieces on the two MILLTURNs, and also for calculating new

„Highest accuracy and best surface quality are playing the lead role at Kapp Niles and represent the most important requirements to our machines."



MASTER PERFORMANCE
The RX 59 machine series is used for the pre-grinding and finish-grinding of pre-profiled screw rotors made from cast iron or steel. This machine type contains some of the components produced on the MILLTURN. From left to right: tailstock, spindle, grinding wheel body

clamping situations and making machining as efficient as possible.

Focussing on the details

The full machining lengths and diameters offered by the two M40-G MILLTURNs are being utilised. "The portfolio of workpieces ranges from coffee cup size to the maximum turning diameter of 520 mm," explains Sascha Forkel. The heart of the machine is the turning-boring-milling unit with X-, Y- and B-axis, with an output of up to 33 kW and a torque of up to 214 Nm. "The design of the milling spindle with 12,000 revolutions per minute enables the efficient use of very small tools and meets all of Kapp Niles' requirements," emphasises Bruno Reisbeck, Regional Sales Manager at WFL. The left-hand turning spindle was specifically designed for the toughest machining tasks and, with an output of 54 kW and a torque of 2,000 Nm, delivers the required degree of productivity during turning. The right-hand turning spindle is equipped with a highly dynamic, integrated spindle motor with a maximum output of 33 kW and torque of 550 Nm. In order to guarantee the necessary machining performance, tool life and process stability in the case of very hard and difficult to machine materials, the machines feature 150 bar coolant pumps. These ensure good chip breakage and optimum cooling of the cuts as well as a longer tool life. On the lower slide system, a 2x12-position disc turret with driven tools reliably goes about its work. The upper and lower system can be used on both spindles or on one spindle simultaneously. A decisive factor in productivity is the large swing of 350 mm above the tool turret, which enables even very large parts to be automatically transferred to the counter spindle. Due to the enormous versatility and machine options, it soon became clear that the M40 variant with counter spindle was the right choice.

Digitalisation gains ground

Data recording is becoming an increasingly important topic. The ability to network is essential: thanks to the large volume of generated process data as well as the availability of data on machine statuses, the machines are perfectly equipped for the future. The iControl process monitoring guarantees extremely reliable processes, which is an important prerequisite for future automation solutions.

WFL also offers an extensive range of automation solutions that it has developed in house. The foundations have therefore already been laid for future success.

TEAMWORK
The project team in front of the M40-G MILLTURN. From left to right: Bruno Reisbeck, Andreas Lehner, Regional Sales Manager for Germany at WFL, Sebastian Morgenroth, Programmer at Kapp Niles, Sascha Forkel, Head of Cubic Machining at Kapp Niles, Michael Kapp, Production Director at Kapp Niles, Christian Brückner, Machine Operator at Kapp Niles

Niles company founded: 1898
Kapp company founded: 1953
Managed by the Kapp family
Number of employees: ~ 1,000 worldwide
Primary sector: High-quality solutions for the fine machining of gear teeth and profiles
Production sites: Coburg/Germany, Berlin/Germany, Großostheim/Germany, Boulder/USA, Dayton/USA,
Diadema S.P./Brazil, Zhejiang/China, Nagoya Aichi/Japan
More than 24 sales partners worldwide

All eyes on

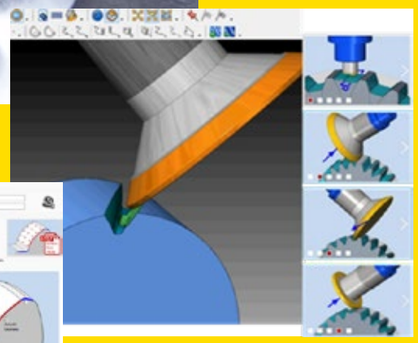
GearCAM

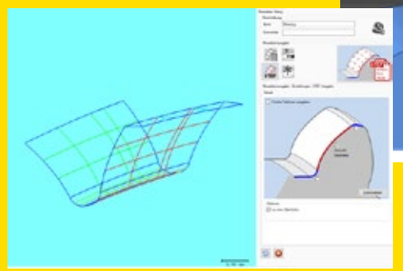
by WFL Millturn Technologies

WFL has specialised in the complete machining of components with complex gears for over 20 years. Due to its ever-growing customer base and experience, the gearing cycles and possibilities have risen enormously. These gearing cycles and possibilities offer many advantages, such as greater flexibility, reduction in special tools or lead times and higher overall productivity.

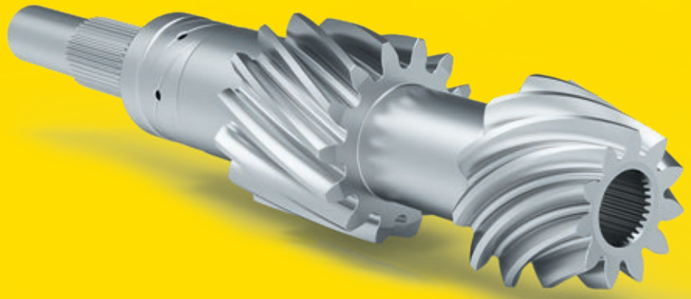
In conjunction with software developer Euklid, WFL is offering a high-end solution with great usability for extremely demanding and complex gearing tasks. The new CAD/CAM software WFL GearCAM opens up extensive programming options for efficient production without special tools and a variety of gearing variants. Completely new gears can be produced quickly, flexibly and with the highest quality using standard tools.

Straightforward troubleshooting and virtual optimisation of machining tasks can be performed. WFL GearCAM enables high-precision gear cutting by making measuring cuts which are then measured in the machine and the tools are corrected fully automatically. WFL GearCAM is particularly suitable for face and helical gears, double helical gears and bevel gears. It ensures finishing of the highest level.





The software is extremely user friendly, as you can choose from a range of strategies for processing individual teeth. Cutting parameters can be taken from an integrated tool database. WFL GearCAM contains many functions for the widest range of gear types (especially for small batch sizes) and can be individually configured. Additional advantages are the reduction in cost due to the use of standard tools and the use of just one licence for all machines.



How does WFL GearCAM work?

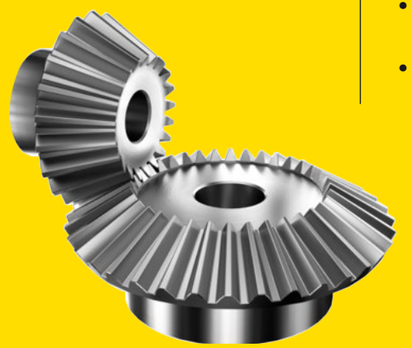
1) Enter the gear data into the input fields
2) Select machining strategies and tools:
   - Rough machining
   - Mill measuring cuts
   - Measurement with automatic correction
   - Finishing
   - Deburring
3) Simulate the machining with GearCAM 3D simulation on external PC
4) Create NC program with GearCAM post-processor
5) Simulate the output NC code in the CrashGuard Studio programming and simulation software
6) Carry out the gear cutting on the machine

Advantages

- Especially for face, helical and double helical gears as well as bevel gears
- Machining with cost-effective standard tools
- Extremely user friendly software
- Straightforward troubleshooting and virtual optimisation of the machining task
- Measure the gears in the machine by means of measuring cycle
- Programming support – cutting parameters from the tool database
- One licence for several machines

Highlights

- Specially for complex gears (and also for non-DIN-standardised norms)
- Time saving and effective
- Extremely user friendly, thanks to graphical visualisation
- Deburring included
- Easy integration in CrashGuard Studio >> simulation can be run
- Increased safety and error prevention for costly workpieces



We love...

...Carinthia

Lying south of the Alps, Carinthia is brimming with Mediterranean flair and has been blessed with an incredible natural environment. The sunshine and gentle wind which blows through the forests relaxes the soul, giving one a simpler outlook on life.

The unbelievable vistas created by Carinthia's many lakes. The mountains on the horizon with their varied heights and shapes. The ever-present gentle lapping of the waves thanks to the soft breeze and the scent of flora and fauna: it's a combination that creates a relaxing yet inspiring atmosphere. Serene walks, a calming environment and the gem in Carinthia's crown, the water, guarantee unforgettable moments for all your senses.

Roots stretching back for centuries

Around 600 A.D. the first Carinthian tribes appear. Here ‚carant' is translated as friend or relative – a meaning that the tourist industry still uses as a slogan today: Carinthia, holiday among friends. The Celts and Romans appreciated the varied landscape, the thermal springs and locations alive with a special mystical power, many of which are still the sites of sacred buildings steeped in thousands of years of history to this day, such as Gurk Cathedral or Saint Paul's Abbey. The historic ‚town of the Middle Ages', Friesach, bears particular testament to the history of the region.

Carinthia's capital Klagenfurt am Wörthersee represents the intersection of three cultures which are alive and well and can still be felt in this Renaissance city: Carinthian culture can be seen in the soft melodic accent, humour and a relaxed attitude to life.

Italian builders shaped the image of the 800-year old town with their palaces, courtyards and squares. Cultural sites such as Klagenfurt Cathedral or the Wappensaal hall at the Landhaus with its 665 coats of arms of the Carinthian estates tell a lot about the city's lively history.

Slovenian culture is present in the markets and in the art of celebration, and also the special harmonies of the songs. The cuisine ultimately combines the best of all three cultures into a delicious fusion from the Alps and Adriatic. Rustic

REGAIN STRENGTH
Alpine hut on Magdalensberg as the sun rises with a view towards the Karawanken mountains, Carinthia, Austria.

restaurants and airy cafés invite one to while away the time as does a visit to the Benedictine Market with its colourful array of regional delicacies from Carinthian farmers as well as Slovenian and Italian market vendors.

The art of slowing down

The Slow Trails with a view of the most beautiful Carinthian lakes offer a chance to slow down, clear your head, exhilarate your mind and soul and find a lasting sense of serenity. The Slow Trail on Lake Ossiach offers an outstanding cultural and natural experience which takes you through mystical moorlands, along untouched shores with a view to the forested mountain range of the Ossiach Tauern and the Gerlitzen Alpe. The path leads from the Domenig Steinhaus (stone house) which regularly hosts top-class events, along the water front, past several farms and onto the sweeping Bleistätter Moor. The clouds reflect off its perfect waters, while from the lookouts and small bridges, you can gaze upon the wide expanses and listen to the music of nature – dragonflies gently flapping their wings, the soft gurgle of the water or the reeds rustling in the wind. Those who embark on one of the Slow Trails in Carinthia and enjoy this natural experience with all their senses will be rewarded with rich impressions which will leave them longing for the next Slow Trail experience.

Sustainable enjoyment

Life in the village is ‚good, clean and fair' – when everyone supports responsible eating habits, promotes biological diversity and develops sustainable agriculture and cooperation between one another. There are now eight Slow Food villages in Carinthia, where this is put into practice in everyday life and shared with visitors.
But what is slow food exactly? Slow Food Carinthia is a union of committed partners who are dedicated to a healthy and conscious food culture and want to break new ground in terms of sustainability and enjoyment. It focuses on the use of seasonal, regional produce as well as artisan production of the best foods and creative refinement of them. Rediscovering old recipes, creating culinary treasures in harmony with nature, producing sustainable foods and sitting down to enjoy them together.

The local taverns therefore cook fresh, pure and honest food. The local Slow Food communities focus on passing on knowledge about the value and production of good food in cookery workshops, nurseries and schools. Those who wish to buy regional foods will find an excellent selection in places of good taste such as farm shops, direct sellers or local suppliers.

FIND INNER PEACE
The Slow Trails are perfect ways to relax.

ENJOY THE VIEW
Spring is smiling in Maria Wörth on Lake Wörther near Klagenfurt.

BREATHE
The Tscheppa Gorge in Carinthia with this breathtaking waterfall on the way.

FACTS
Population: 560.939
Size: 9.536 km²
Capital: Klagenfurt am Wörthersee
Districts: 132

EDITOR'S TIPS:

Slow Trails:
www.kaernten.at/slowtrails

More information on Slow Food Carinthia
www.kaernten.at/kulinarik

Pyramidenkogel observation tower at Lake Wörthersee
Linden 62, 9074 Keutschach am See

Terra Mystica & Montana show mine
Antoniweg 5, 9530 Bad Bleiberg

Eagle show at Castle Landskron
Schloßbergweg 30, 9523 Villach

Minimundus (miniature park)
Villacher Strasse 241, 9020 Klagenfurt

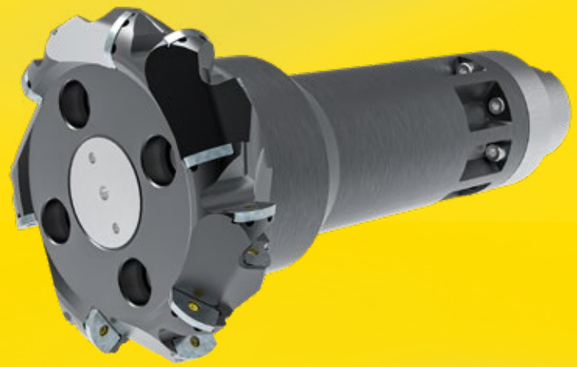
More information on Carinthia:
www.visitklagenfurt.at
www.kaernten.at
www.berglust.at

All eyes on

Crankshaft machining with the ultimate in precision and quality

Thanks to the newly developed form cutter from WFL Tooling Solutions, the surface quality of undercuts on large crankshafts can be significantly improved. The mirror-smooth surface considerably reduces downstream processes. Whether it's vibration dampers for vibration-free machining, adjusting elements for precision presetting to the micrometre or razor-sharp indexable inserts for maximum precision – the new WFL finish milling cutter is without doubt a real sensation.

When it comes to machining large diesel crankshafts, which are used in ships and energy engineering, an undercut is produced for each crankpin on the left and right at the end of the diameter. These undercuts have a shape that is specific to the customer or type. Each crankshaft manufacturer therefore produces its own undercuts based on the type in question. These expose the crankpin in the radial and axial direction. On one of the current test workpieces, the new finish milling cutter milled an undercut with an axial depth of 25 mm and a radial depth of 0.7 mm, for example. The entire undercut can be produced in just one pass. Such undercuts are usually manually polished once the crankshaft has been finish-ground. This time-consuming process is very important as any tool marks can lead to a crankshaft notch fracture at this point. A 9-stroke crankshaft has 18 such undercuts which need to be polished. If the polishing pen slips, then, in the worst case scenario, the entire crankshaft can be ruined if the diameter is damaged. Thus errors mainly occur during the manual processes.



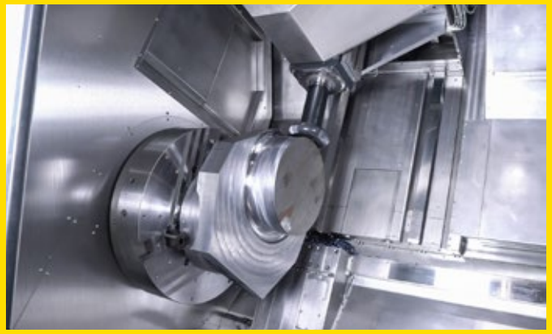
The new form cutter from WFL for optimum surface quality when machining crankshafts.

This is the key
In 2020, WFL Tooling Solutions worked intensively on a method for more precise machining of undercuts. The aim was to construct a form cutter with a precision design. The result is the undercut finish milling cutter: a highly precise finished tool that can achieve a surface quality of < Ra0.4 and leaves no steps in the radius area. Such milling cutters normally have several indexable inserts to cover the entire shape, however the transition between the indexable inserts is later visible as a mark on the workpiece. WFL therefore uses very large indexable inserts for the new form cutter to resolve this problem and produce groove-free undercuts.
The form cutter has a very large, effective number of teeth for high feed rates and short machining times, as well as large, individually ground indexable inserts. To achieve as little thrust force as possible, they are ground razor sharp, leaving a tool that combines maximum precision and maximum sharpness.

Special tool accommodation
Tools for crankpin machining require large overhangs due to the unfavourable interfering contour of a crankshaft. The technicians at WFL Tooling Solutions have developed an extremely stable tool accommodation to suit such form cutters, with the option to finely adjust the roundness and axial run-out. Run-out errors for such precision tools must be avoided, as the tool then only machines at the highest point and does not work all around as should be the case. WFL has therefore installed an adjustment element in the new form cutter, which can be used to adjust the tool in the machine radially and axially in the µm range.

Vibration dampers for vibration-free machining
Furthermore, the tool also features vibration dampers to prevent generation of vibrations during machining. Unlike other concepts, these are not located at the rear of the tool, but very close to the tool cutter. This special know-how efficiently prevents vibrations. Challenging machining of crankshafts requires more than just a perfect tool; it also calls for the corresponding WFL machining cycles for machining the crankpin. When the milling cutter plunges and retracts it passes a very critical point. This area involves different cutting conditions to the rest of the machining action. Such factors must be taken into account to prevent errors. Suitable software and years of experience also help, in addition to the tool, to achieve the required quality. The improved surface quality and reduction in downstream processes are testament to the success of the new WFL finish milling cutter.

Production of maximum-precision undercuts.



Vibration-free machining thanks to vibration damper near to the tool cutter.

The features at a glance:

- Vibration damper near to the tool cutter for vibration-free machining
- Large, individually ground indexable inserts for maximum precision and surface quality
- Razor-sharp cutting edges to minimise the thrust force
- High, effective number of teeth for enormous feed rates and short machining times
- Stable tool accommodation
- Minimum roundness and axial run-out errors on the tool thanks to manual fine tuning in the machine
- WFL cycle package for crankshaft machining

The range of parts of MILLTURNs ranging from screw tips, the plasticizing unit, swivel discs, hollow shafts, up to spars.

Wittmann Battenfeld

Plastic technology par excellence

It's all about plastic. This material, which has many impressive technical properties, can be found in so many areas of our lives. And it is a sector where Wittmann Battenfeld excels. The company has a modern, diverse and, above all, modular range of machines for processing plastics and other plasticisable materials and is a true leading player in the market. An M30 MILLTURN from WFL has recently taken centre stage in the production of high-precision rotating machine components.

The gentle vineyards south of Vienna with their typical ‚Heuriger' wine taverns and abundant thermal springs with healing qualities are a real pleasure. Not only is the area famous for its skilful use of the delicious and beneficial liquids provided by nature, it is also known for its use of a completely different kind of liquid – liquid, or more accurately, free-flowing plastic. As the primary material is not liquid at all and has completely different properties to the resulting material, sophisticated machines, complex processes and very special expertise are required. The state-of-the-art injection moulding technology from Wittmann Battenfeld is used to create high-tech products for industrial and medical applications as well as everyday items.

The Wittmann Group employs over 450 people at its site in Kottingbrunn and is one of the world's leading manufacturers of injection moulding machines, robots and peripheral equipment for the plastics processing industry. The company consists of two main divisions: Wittmann Battenfeld and Wittmann. Over 2200 employees around the world work for the Wittmann Group, which is active in industries such as automotive, medical technology and packaging.

Wittmann Battenfeld is, without a doubt, one of the major players in its field, with a modern and diverse range of servohydraulic or electric machines – which can be either horizontal or vertical depending on the customer's needs. Wittmann's product range includes robots and automation systems, material supply systems, dryers, gravimetric and volumetric dosing units, granulators, and tempering and cooling equipment. The two divisions therefore complement each other perfectly and customers benefit from a complete solution from a single source. It's no wonder then that this is where all sorts of high-precision, sophisticated components in highly individual designs come into being. And it was almost natural that complete machining would become an important production strategy long ago. As a pioneer in complete machining with a diverse range of machines, WFL supplied the sought-after production equipment early on.

In the fast lane

„We introduced the principle of complete machining into the company way back in 1993, beginning with the purchase of a M70 MILLTURN. In 1995, we added a M50 MILLTURN. Before this, we had a multi-step production process, i.e. turning and milling on several machines," says Martin Gorzolla, Head of Production at Wittmann Battenfeld. Even back then, all turning, drilling and milling operations had already been combined in a single machine. The concept of complete machining makes production more efficient, removes wait times and ensures flexibility. In general, the aim is to reduce lead times.

„But above all, excellent accuracy was one of the most important requirements for the machine," explains Gorzolla. An M60, an M65 and an M40 MILLTURN were added in subsequent years. The two older M70 (1993) and M50 (1995) models were replaced with the new M30 MILLTURN in 2020. In addition to maintaining the high level of accuracy, the key criteria behind

the purchase were value for money and machine reliability, which were ultimately fulfilled by the WFL machine. „One of the other deciding factors was the proximity of WFL," explains Martin Gorzolla. „The Service department is very quick; the WFL team can be here in just 2 hours. Also, the WFL Service team have always been excellent in terms of speed and reliability. That is a huge plus point. We've been very pleased with the machines over the years so we didn't even think about switching to another provider," adds Gorzolla.

The MILLTURN range of parts

The MILLTURN machines can fully machine the range of parts, from screw tips, the plasticising unit, captive C-washers, hollow shafts to struts, and many other workpieces. „We use these machines for anything that needs to be ultra-precise. We usually only need one of each component that we produce for our injection moulding machines. Our products are highly customised, so we don't have any big batch sizes. Everything must be ready just-in-time," explains Christian Grafl, Head of Maintenance. Not only are Production and Assembly set up to handle this, programming is highly customised too. The programming team are masters at this. They use the EXAPT Plus programming system to apply the CAD data and create and realistically simulate the program quickly and reliably. Thanks to the perfectly optimised post-processor, the programs are converted fully automatically into machine-readable programs and sent to a PC directly next to the machine in question via the internal network. The machine operator calls the jobs up, loads the program into the machine's NC controller and – if they are not already in the magazine – orders the required tools from the warehouse via the internal tool management system. Workpieces with diameters of 85 mm to lengths of 4200 mm are currently being produced on the different MILLTURN machines. „This has allowed us to reduce machining times by around 20%. A real advantage when it comes to highly efficient production," says Martin Gorzolla, Head of Mechanical Production.

The new member of the ‚MILLTURN' team

In 2020, the M30 MILLTURN was procured as a replacement for the M50 and M70 and is already hard at work producing components. With a milling power of 20 kW, it is able to efficiently machine workpieces up to a maximum diameter of 520 mm and a maximum machining length of up to 2000 mm. Currently, the extremely different workpieces are mainly being manufactured in batch sizes of 1 on the MILLTURN. The machine model impresses with its extreme stability, reliability and precision. It offers top performance for all machining tasks with 4000 or 9000 revolutions per minute on the main drive and turning-boring-milling unit. The turning-boring-milling unit with its strong gear spindle with backlash-free B-axis also allows for use of large drills and milling cutters and therefore high feed rates with a large cutting depth. Stability is essential – and this is thanks to the solid slant bed made of grey cast iron and WFL's typical axis arrangement, which directs the main cutting forces vertically into the bed. Particularly wide guide spacing, large guides and minimal distances between the machining point and the guides all help ensure stable behaviour during difficult cuts as well as thermal stability for high-precision machining. Optimum chip flow is ensured by the fixed, completely smooth guide plate on the lower slide. The tightest of tolerances in all angles can be achieved thanks to the high-precision, stable B-axis with direct measuring system and additional mechanical indexing through a Hirth coupling. Wittmann Battenfeld generally uses machines with a tailstock. A stable steady rest slide with an automatic self-centring steady rest is also fitted. This configuration offers great flexibility and enables a wide range of workpieces to be machined with little changeover work.

A 40-position disc magazine provides a sufficient tool stock at the machine. Wittmann Battenfeld opted for a Capto C6 tool system for the M30 MILLTURN. It features an impressive selection of boring bars with C6 coupling as well as excellent stability and precision. Tools up to 450 mm long can be used in the machine. The magazine capacity and tool length could have been greater, but this was not required. An 80 bar coolant pump is used, especially for a wide range of internal machining operations. The standard milling spindle design permits not only a high pressure of up to 150 bar, but also an extremely high coolant flow through the spindle. This leads to a noticeable improvement in chip breakage, chip removal and the process reliability for all drilling operations. WFL also has a reliable coolant interface for the tool as well as matching hardware components such as high pressure coolant pumps, microfilters and additional cooling devices. The increasing use of high-strength materials requires technologies that can also reliably machine these ‚super' materials. Alongside the huge time savings, there is an improvement in process reliability and surface quality as well as controlled chip removal. Unwanted heating of the workpiece is reduced to a minimum.

Eyes set on the future

Wittmann Battenfeld is aiming to increase its global market share for standard machines. This naturally involves following a very focused and long-term product and sales strategy. „The most important thing is maintaining manufacturing and production expertise for critical parts in house and extending the necessary production know-how to increase efficiency and optimisation," says Marc Zachmann, Head of Production.

„We've already connected operational technology (OT) to our ERP system and will continue on this path. „The main reason for connecting this technology is to increase production efficiency, for example with automatic generation of technical parts lists during autonomous processing of orders in fully automatic welding systems, as well as production responses from production units to our ERP system," explains Marc Zachmann.

Wittmann Battenfeld offers a proprietary Industry 4.0 solution for the products; complete injection moulding work cells, consisting of an injection moulding machine, automation and peripheral devices. This solution enables production units to be formed through several intelligently connected components operating in a work cell. This allows the individual components to talk to each other via OPC UA, share settings and statuses and even carry out self-optimisation. This unique mix of innovative products and efficient production means Wittmann Battenfeld is well prepared to face the future.

SETUP PROCESS
Wittmann Battenfeld is currently using four different MILLTURNs. These include an M40 and M65, which are mainly used for the manufacture of wave-shaped workpieces.

THE TEAM
The team that works with the Millturns at Wittmann Battenfeld, from left to right: Mario Kreppenhofer, Machine Operator, Martin Gorzolla, Head of Mechanical Production, Christian Grafl, Head of Maintenance, Marc Zachmann, Head of Production

WITTMANN Group: 2240 employees, worldwide, 8 production sites in 5 countries, 32 subsidiaries
Industries: Automotive, medical technology and packaging industry, automation, peripherals (drying technology, conveyor technology, etc.)

All eyes on

Overview WFL Software Solutions

by WFL Millturn Technologies

Are you facing seemingly insurmountable challenges considering manufacturing technologies or other technological issues? We are happy to share our know-how with you and support you with various WFL software solutions which serve to avoid collisions and support you in optimizing processes.

CrashGuard Studio
„The Steersman"

- Visualization of all programming steps for error detection at an early stage
- Improved quality of NC programs with respect to efficiency and machine safety
- Shorter set-up times on the machine, thanks to prior simulation
- The machine operator receives a collision tested, finished program
- Easy to program
- All 3D geometry data (tools, clamping devices and workpieces) can be used for both CrashGuard and CrashGuard Studio.
- The DXF import enables 2D elements to be imported from a DXF document into the contour editor. This is available, for example, for the operations of contour turning, contour milling, and contour pocket milling.
- Maintenance contract available
- Full-featured 3D workspace with collision monitoring

Programming and simulation

Millturn PRO
„The Maker"

- Programming directly on the machine control
- Efficient and easy creation of NC programs
- A cost-efficient alternative to the full version CrashGuard Studio
- Millturn Pro is available for operator panel and PC
- NC programs created in CrashGuard Studio can be edited directly at the interactive monitor of the operator panel
- The tool cutting edge generator makes it possible to create approximate tool models for the material removal simulation.
- No maintenance contract
- No 3D workspace

Programming

CrashGuard
„The Inspector"

- Effective protection against collisions in automatic and manual operation
- Collision-free operation even after program interruptions and manual intervention
- At any time, the CNC system is aware of current positions of axes and speeds, PLC signals are also taken into account
- Current settings of the control such as zero offsets, coordinate transformation, etc. are taken into account
- "Reaction time" = 0 (real time)
- All 3D geometry data (tools, clamping devices and workpieces) can be used for both CrashGuard and CrashGuard Studio.

Production

Coming soon

Screw programming with Screw-CAM - the new plug-in in CrashGuard Studio:

Geometric functions:
- Single or multiple channels
- Changeable depth
- Any change in pitch
- Wall shaping with radius to the channel base and wall inclination angle in the longitudinal cut or in the channel cross-section

Technological functions:
- Rough machining with automatic cut distribution and Y-offset control (turn-milling)
- Finishing of walls with automatic "best-fit" tool positioning (B- and Y-axis)
- Finishing of channel base
- Chamfering of barrier bars

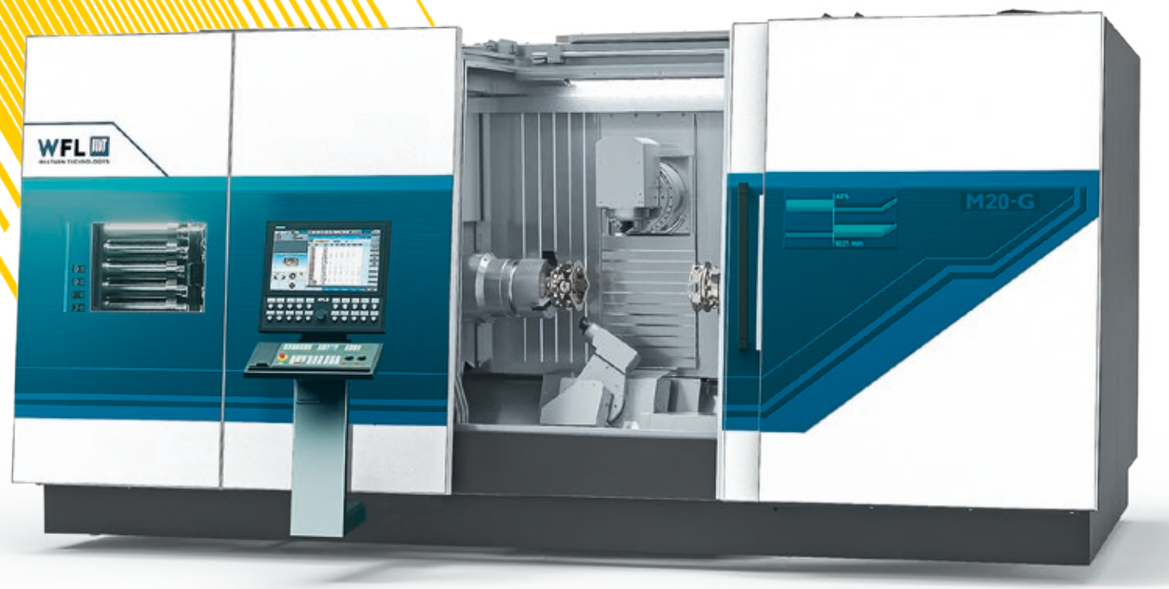
Process:
1. Modeling of the screw geometry >> Input of diameters, pitches, wall inclinations, radii, bar or channel widths
2. Creation of the NC program >> Definition of the individual machining processes, tool selection, cutting speeds, feed depths, feeds
3. 3D simulation (CrashGuard Studio) >> Check that the generated geometry does not cause collisions by means of material removal simulation
4. Production

Benefits:
- Programs based on 2D drawings
- Preview of 3D objects
- All processing steps for manufacturing a workpiece in one software
- Simulation in CrashGuard Studio

M20 MILLTURN–
The powerful and smart solution

»Simplicity is the ultimate sophistication.«

Leonardo Da Vinci
(auch Steve Jobs verwendete diesen Ausspruch)



The die is cast. Not only in terms of new design, but also technical diversity. The MILLTURN turning-boring-milling center has been developed significantly over the last few years and brings great innovations with it. In the field of machine tools, the M20 proves to be extremely dynamic, powerful and, above all, smart.

Full power and energy flow through the veins of the M20. The machine is suitable for machining workpieces up to Ø 500 mm and is equipped with a powerful 44 (32) kW turning spindle as well as a powerful 20 kW milling unit with 20,000 rpm. Moreover, the machine can be equipped with a monitoring system for the motor spindle that records temperature and vibration values and forwards collected data to external systems if required.

„Smart machining" is at the heart of the technological innovations at WFL, which ensure triumph in the MILLTURN arena thanks to gear skiving, B-axis turning or non-circular turning. The range of applications covered by the M20 is almost infinite, capable of carrying out demanding and complex machining tasks found in the aviation, automotive, engineering and plastics industries. Thanks to its excellent flexibility, the machine is also ideally suited for contract manufacturers.

A particular highlight is the innovative design of the machine. The M20 MILLTURN is characterized by straight-lined forms, minimalist design and optimum ergonomics. The doors and windows are made of glass and feature an integrated display of performance data as well as an integrated access to the tool magazine. The MILLTURN hero's fresh appearance is further supported by its bright coloring. A convenient and user-friendly operation round off the unique design.

»With the M20 MILLTURN, we want to offer our customers a dynamic and powerful machine that covers a diverse range of applications.«

Mag. Norbert Jungreithmayr, CEO WFL Millturn Technologies

Automated loading and unloading

- Integrated production cell
- Articulated robot
- Gantry loader
- Bar feeder

Technical Data		M20	M20-G
Centre distance	mm	1.000	1.000
Max. turning diameter between centres	mm	500	500
Max. power, main spindle 40% at (100%) duty cycle	kW	44 (32)	44 (32)
Max. torque, main spindle 40% at (100%) duty cycle	Nm	838 (610)	838 (610)
Max. speed, main spindle	min-1	4.000	4.000
Max. power, milling spindle at 40% (100%) duty cycle	kW	25 (20)	25 (20)
Max. torque, milling spindle at 40% (100%) duty cycle	Nm	110 (85)	110 (85)
Max. speed, milling spindle	min-1	20.000	20.000

Variety of Technologies

Turning, Boring, Milling, In-process measuring, Turn-milling, 5-axis milling, B-axis turning, Shaping of external gear teeth (Flanx-Spline), Milling of external gear teeth (Flanx-LM), Special tool heads, Deep hole drilling, Milling of external gear teeth (Flanx-Invo), Gear Skiving, Hobbing of gear teeth (Flanx-Hob), Cam milling, Milling of crankshaft pins, Internal turning

Integrated workpiece handling – Features of the intCELL:

Shaft parts
- Diameter: max. 100 mm
- Length for double change process (individual change process): max. 300 (800) mm
- Weight for double change process (individual change process): 15 (30) kg

Chuck parts
- Diameter: max. 300 mm
- Length: max. 150 mm
- Weight: max. 15 kg

SMART, because

- WFL has decades of expertise in complete machining
- Manifold machining technologies
- Production cell with integrated loading and unloading without high gantry
- Individual tool holder at the bottom
- Very small gaps in the lower slide systems, as there are no telescopic plates
- Powerful motor spindle
- Extensive sensor technology
- Two B-axis systems in one machine for simultaneous B-axis turning
- Integrated workpiece handling
- 24" multitouch screen (1920x1080 px)
- Operator panel with lean and modern design

All eyes on

Measuring technology

by WFL Millturn Technologies

To manufacture complex parts with high quality requirements, processes must be controlled in a ‚closed loop'. WFL has focused on measuring workpieces in the machine ever since complete machining first began and has developed cycle packages for a variety of measuring tasks. The measurement method developed by WFL enables maximum manufacturing precision to be achieved with the tightest dimensional and positional tolerances on complex workpieces. A wide range of measuring equipment, such as touch-trigger measuring probes, scanning measuring probes, ultrasonic measuring devices or temperature measuring devices, is available for this.

Scanning measurement

The machining of large, heavy and complex workpieces poses significant challenges for measuring systems. With scanning measurement systems, digital measurements and analogue scanning processes can be carried out directly on the mac hine.The analogue probe ‚scans' the surface to generate thousands of measurement values in a fraction of the time. Quick measurements of up to 2 m/min are possible with complete accuracy.
This makes fully automatic roundness, run-out, axial run-out, shape and teeth measurement possible.

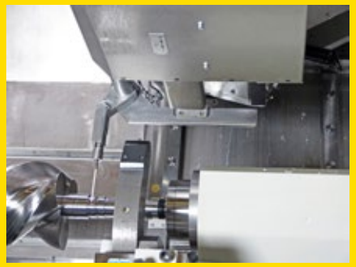
The black line represents the nominal dimension, the blue the scanned actual dimension and the red the specified tolerance. The green curve shows a preview after the corrections have been applied, which are automatically accepted by the NC program.

Valuation of roughness measurement: The raw measured data is shown on a graph. The measurement results can be read to the mid-right (Ra = arithmetic average roughness value, Rz = roughness depth, Rt = maximum roughness depth).

Evaluation of toothing measurements: Here the results of each tooth gap are displayed with left and right impression. The measurement results can be seen at the top right (F = total deviation for profile and flank line, ff = shape deviation for profile and flank line, fH = angular deviation for profile and flank line).

Integrated workpiece measurement on the turning-boring-milling unit

One special variant is an in-process measuring probe fixed on the turning-boring-milling unit for integrated workpiece measurement. This can be swivelled in or out fully automatically, without swapping the machining tool, thereby reducing workpiece lead time. It also has a beneficial effect on precision when working with measuring cuts for very tight tolerances.



Workpiece measurement with measuring probe on the turning-boring-milling unit.

Ultrasonic measurement

Automatic ultrasonic wall thickness measurement is used for precise quality monitoring as well as position determination of inside to outside diameter (concentricity) for tube-shaped workpieces for which the measuring point cannot be reached with conventional workpiece measuring probes. The measurement tool is protected by a PVC cover and directs the ultrasonic signals via the coolant. The measurement result is displayed directly at the control unit in real time.
Typical application areas for ultrasonic measurement are those in the aerospace industry, e.g. for testing engines .

The signal for the ultrasonic wall thickness measurement is transmitted via the coolant.

In-process measuring

After the workpiece is clamped, the control unit automatically records the longitudinal and circumferential orientation of the workpiece with one of the measuring probes changed from the tool magazine. After that, machining continues relative to the actual position to compensate for any error effects.
Both selective and scanning measurement can be performed during in-process measuring, depending on which switch head is fitted. The flexibility offered by measuring probes from the tool magazine is virtually unlimited, as several measuring probes can be equipped with a wide range of switch heads (touch-trigger or scanning) and probe styluses (different lengths, ball radii, straight, angled, star-shaped, T-probe, etc.).
Once the machining sequence has finished, the workpiece can be automatically measured and the workpiece precision logged. The data obtained in this way can be used to carry out extensive analysis directly at the machine or via LAN and measuring protocols can also be printed out.

Measurements are shown (actual value, nominal value, tolerance, etc.) on the control unit display.

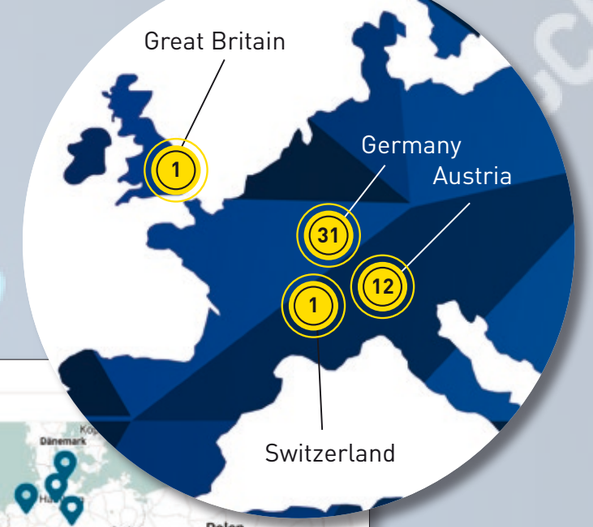
myCapaMax
What is it, what can it do?

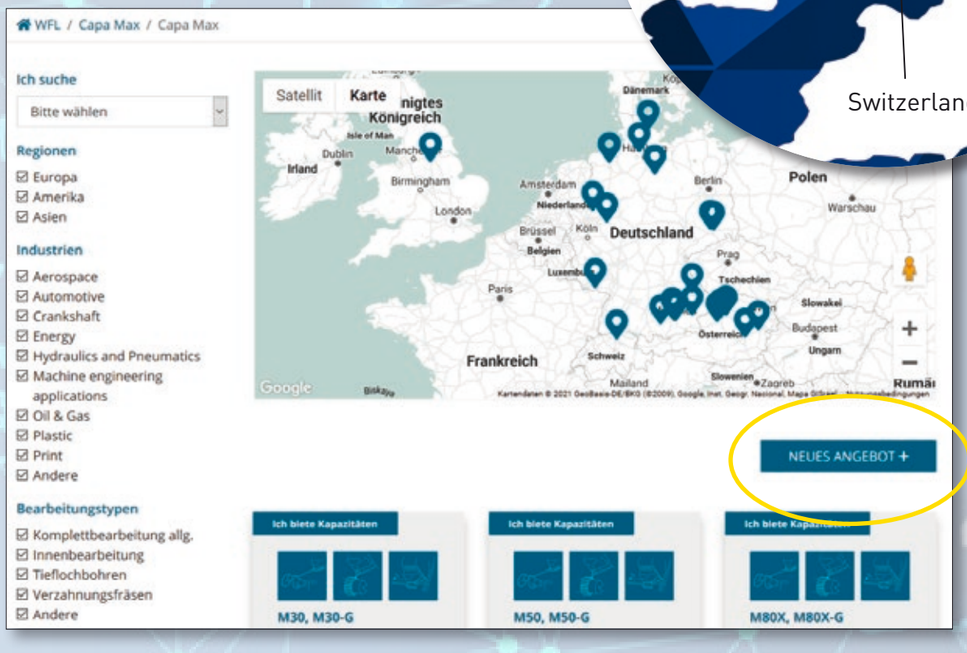
myMILLTURN is the new customer portal which was launched at WFL in 2020. The new edition of COMPLETE focuses on one aspect of myMILLTURN: the capacity mediation platform myCapaMax. An interview with Christian Haunschmid, Project Manager my MILLTURN – the WFL customer portal.

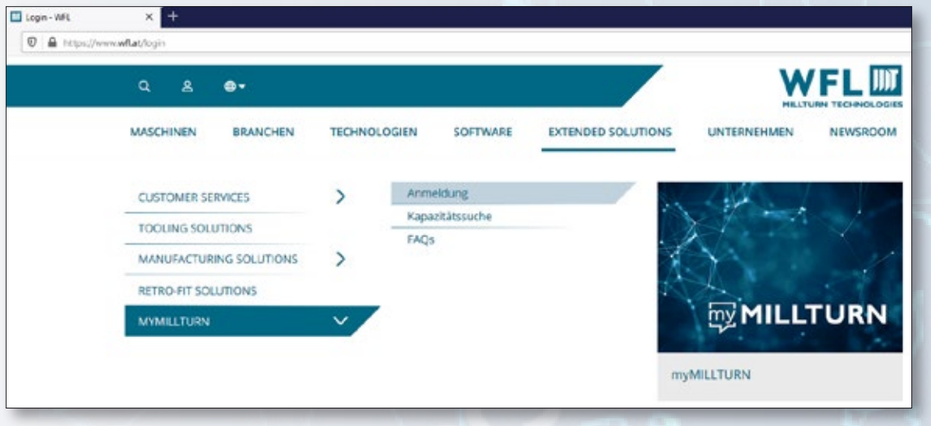
Mister Haunschmid – how can the machine utilisation of WFL customers be maximized via myCapaMax?
myCapaMax is a special innovation in the myMILLTURN customer portal. This is an anonymous database which makes MILLTURN capacity available for producers. This mediation platform can open up an additional sales channel for those periods when the order books are heaving and also during less lucrative periods. Users can search for or advertise production orders as well as find or offer free MILLTURN capacity.
Thanks to the portal, the production expertise and experience of WFL customers can also be offered to external customers. These can submit a capacity request on the WFL website, without the need for direct access to the portal. These external enquiries are processed by our specialists and sent to matching WFL customers in the portal. The ability to target external customers with an offering generates a huge number of enquiries.

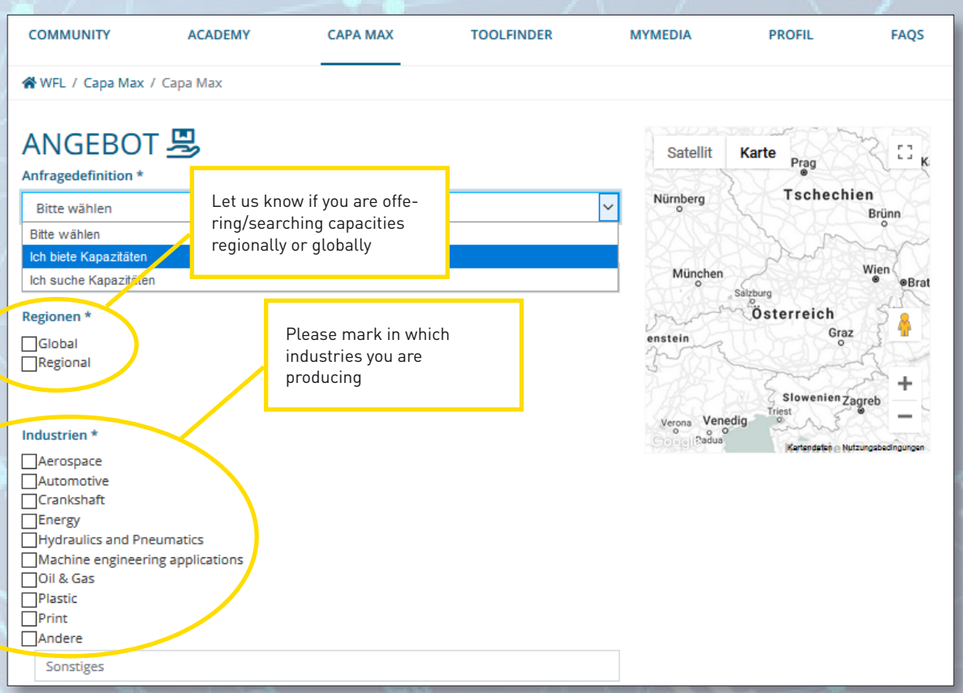
So, WFL connects machine utilisation and requests?
Correct. WFL Matching is the essential WFL service from myCapaMax. Our application experts will analyse the available offers and enquiries for feasibility. If a positive match is found, our customers are contacted, in adherence with confidentiality agreements, to agree the next steps. We would be pleased to offer advice on WFL's services during myCapaMax mediation.

How can I offer my capacities in the portal?
Register now and enjoy access to this exclusive mediation platform. Once you have registered, you can quickly and easily mark your MILLTURN complete machining centres as available. You can efficiently place new offers on your account in no time at all. Click „I am searching for...", select a „Capacities / Production Orders" category, and enter your company and machine data – it really is that simple! You can set individual filters to make your search more relevant and also set limits on your available capacity by indicating batch sizes. Click „Create" to automatically add your machine to WFL's matching database.

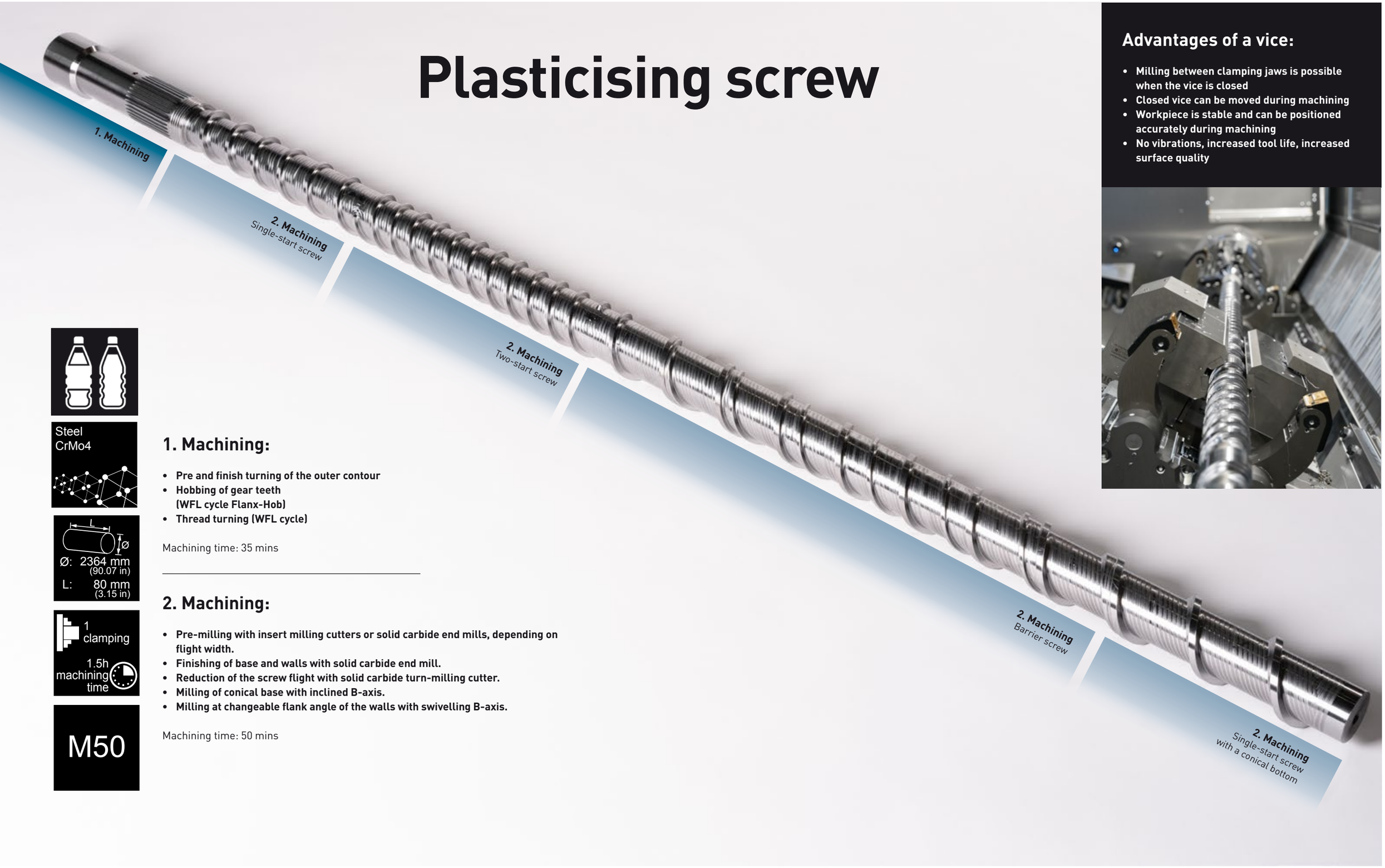








Plasticising screw



1. Machining:

- **Pre and finish turning of the outer contour**
- **Hobbing of gear teeth (WFL cycle Flanx-Hob)**
- **Thread turning (WFL cycle)**

Machining time: 35 mins

2. Machining:

- **Pre-milling with insert milling cutters or solid carbide end mills, depending on flight width.**
- **Finishing of base and walls with solid carbide end mill.**
- **Reduction of the screw flight with solid carbide turn-milling cutter.**
- **Milling of conical base with inclined B-axis.**
- **Milling at changeable flank angle of the walls with swivelling B-axis.**

Machining time: 50 mins

Advantages of a vice:

- **Milling between clamping jaws is possible when the vice is closed**
- **Closed vice can be moved during machining**
- **Workpiece is stable and can be positioned accurately during machining**
- **No vibrations, increased tool life, increased surface quality**

QUESTIONS I COMMENTS I IDEAS?
You have questions regarding our products, technologies or machining? We are looking forward to your mail at **office@wfl.at**

FACTS COMPLETE
Our customer magazin „COMPLETE" is available in German and English. Additionally a download link can be found on our homepage.

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