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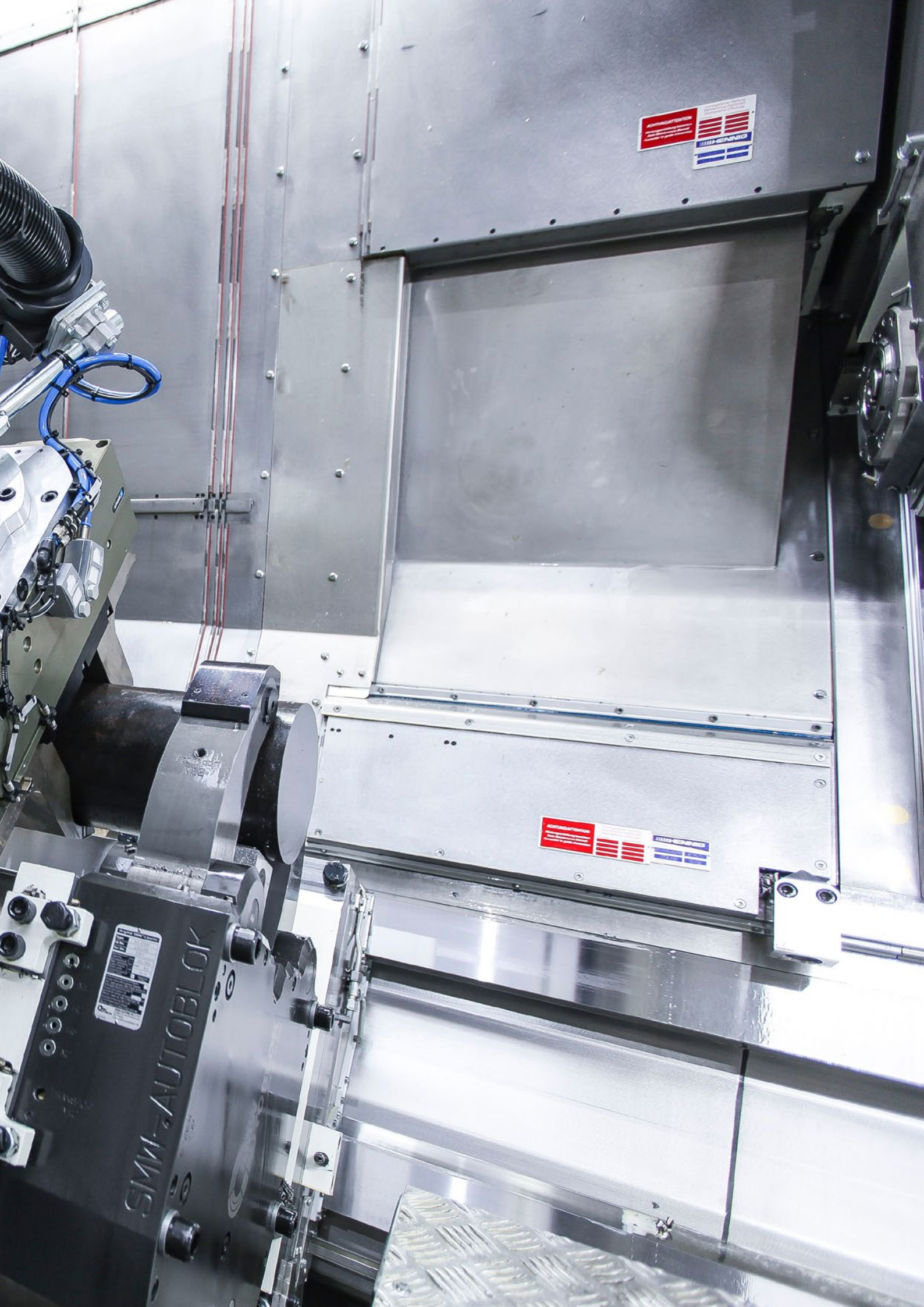
Technology Meeting 2026
Inspiration for the manufacturing of tomorrow

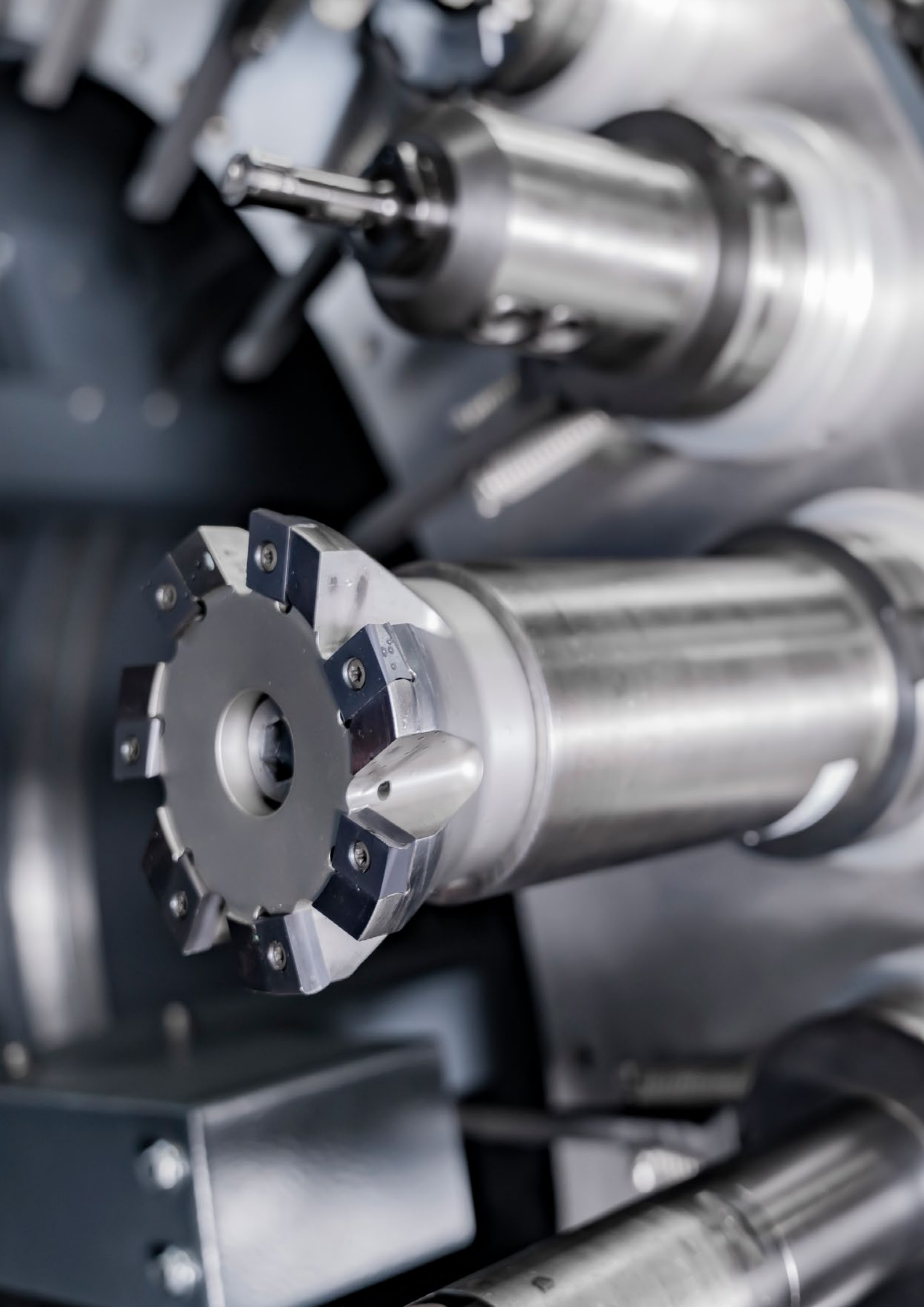
The complete
machining magazine

WFL 
MILLTURN TECHNOLOGIES

WFL
MILLTURN TECHNOLOGIES

D1
ACHTUNG!
Nicht nach Auspendeln
umsetzen. Werkstücke
bei Maschinenanfahrtung





Dear customers, Dear readers,

In times of change, personal interaction, expertise and collaborative solidarity are more important than ever. That is why a particular highlight of the year is once again our tried-and-tested Technology Meeting, taking place from 5 May to 7 May 2026 in Linz. Over these three days, we are particularly looking forward to direct dialogue, practical insights and open discussion with customers and partners.

What topics can you expect in this issue?

Behind the scenes:

In this section, we turn the spotlight on Günther Siegwart. He is responsible for testing at WFL and, in an interview, talks about his day-to-day work, the challenges and the successes in the field of testing. A particularly fascinating insight into WFL's pre-development!

Automation Solutions:

The demands on modern automation solutions are rising rapidly – and WFL has been responding to this for years. More and more customers expect the highest flexibility, consistent process reliability and maximum output. With intelligent automation concepts, WFL Automation Solutions addresses these needs head-on and offers tailor-made solutions to the growing challenges in the manufacturing industry. There is a clear trend towards turnkey projects. Customers no longer want to simply buy a machine, but a turnkey production system – from machine builder to solutions provider.

Software updates:

In this issue, you'll also find exciting information about CrashGuard Studio and Millturn PRO. In which areas do these two software solutions specifically support programmers and machine operators? Turn to page 15 and immerse yourself in the world of WFL Software Solutions.

Spotlight on India:

Our new section "Connecting Continents" highlights WFL's international networking and strong commitment. To kick off the series of articles, we shine a spotlight on our office in India. In this interview, General Manager Praveen Kurup provides insights into market trends, industry developments and the strategic direction of the branch. Find out how the Indian team contributes to WFL's global success through innovation and customer focus.

Success Stories:

Wherever air and gases are conveyed or compressed, machines and units from the German company Aerzen are in use. The list of applications is diverse and covers virtually all industrial sectors. At the headquarters in Aerzen, there are now ten M65 MILLTURNs from WFL. The first machines were commissioned as early as 2007 – a successful concept that has been consistently further developed. This is demonstrated by the last two M65 MILLTURNs purchased, which feature automation with a loading robot and pallet storage from Kardex.

Kammerer Gewindetechnik GmbH & Co. KG from Germany has stood for decades for the highest precision in the conversion of rotary to linear motion. Its components – ball screw drives, linear guides and customised screw drives – can be found wherever precise movements are essential. To ensure it can meet these demands in the long term, Kammerer has relied on WFL technology for years. Following excellent experiences with an M40 MILLTURN, the company decided to take the next step: investing in an M30-G MILLTURN, including automation and a storage tower.

We hope you enjoy reading this exciting feature!

Your WFL Management Board,
Franz Schön, Günther Mayr, Stefan Hackl





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Efficiency redefined

M20 MILLTURN



M35 MILLTURN



M50 MILLTURN



M50 MILLTURN



M50-G MILLTURN



TECHNOLOGY MEETING 2026

5-7, May 2026 | Linz, Austria

Experience state-of-the-art MILLTURN technology live across more than 4,000 m²:
from M20 to M150.

Look forward to turnkey solutions, automation, multiple interlinking and exciting
insights directly during operation.

M70 MILLTURN



M70 MILLTURN



M80X MILLTURN



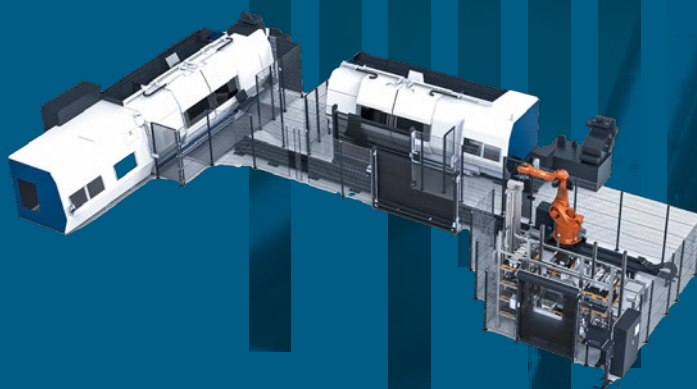
M100 MILLTURN



M150HW MILLTURN



M150HWY MILLTURN



You can find all the
information here!



Mark the date in your
calendar!

More than just a machine:

A partner for Life

At WFL, the machine tool has never been viewed merely as another piece of production equipment. For Christian Jagersberger, Vice President of Sales, its value lies as much in its cutting-edge technology as in the long-term relationship built with each customer. He shares his insights into the company's DNA, his assessment of the market, and the ongoing changes reshaping the industry. Following a remarkable 2025, WFL aims to maintain its momentum in 2026 and drive the technological advancements that will shape the future of manufacturing.

What defines WFL today

Above all, WFL is a coming together of diverse personalities united by a shared mindset: entrepreneurial spirit and the constant drive to find the best solution for customers. This customer-centric philosophy is deeply rooted in WFL's culture.

One of the key pillars of this approach is the longevity of our teams. Employees stay, grow, pass on their expertise, and serve as role models for the next generation. This loyalty is no coincidence—it stems from a corporate culture that prioritizes quality of life in the workplace. A calm environment, genuine respect, and a deeply rooted technical culture cre-

ate fertile ground for excellence. It is this human foundation that enables WFL to consistently meet the high demands of industries where precision is indispensable.

A bold and differentiated approach

WFL occupies a unique position in the market. The company does not simply deliver a machine, but a complete solution. In addition to machining technology, WFL offers automation, project management, process integration, and long-term customer service. This commitment is tangible: spare parts are available throughout the machine's entire service life, which is a rarity in the industry.



This comprehensive vision also includes retrofitting, an area that WFL is actively developing. Used machines are completely overhauled at the Linz plant, brought up to date, and adapted to new customer requirements as needed. This technical expertise offers an alternative to purchasing new machines and extends the service life of equipment originally designed for longevity.

A market perspective that drives innovation

To remain at the forefront in the long term, WFL relies not only on technological excellence but above all on a firmly established mindset within the company: the commitment to consistently deliver performance above the market average. The foundation for this is a corporate culture characterized by curiosity, a sense of responsibility, and the continuous pursuit of improvement.

A keen sense of industry developments, as well as a deep understanding of our customers' challenges and needs, are at the heart of everything we do.

This commitment is reflected in our consistent efforts to continuously advance the automation of manufacturing processes at MILLTURN — with the goal of fully automating the production of even highly complex and precise components. The projects planned for 2026 are an expression of this mindset. They embody our commitment to challenging existing limits and transforming production processes sustainably with new solutions.

One of WFL's strengths lies in its global presence. The company learns just as much from European markets as it does

from users thousands of kilometers away. This diversity fosters a global perspective, connects different practices, and ensures that every customer benefits from feedback gathered worldwide. WFL in Linz can learn from an operator on the other side of the planet.

One thing, however, remains unchanged: the longevity of its machines. Their robustness continues to form the basis for a wise investment.

The flexibility offered by WFL's machining capabilities allows customers to evolve their production without having to replace their equipment.

This adaptability of the machine is indispensable, as it not only enables high flexibility in a dynamic market environment but also ensures long-term competitiveness.

A future shaped by automation and sustainability

WFL's future lies in delivering complete systems consisting of MILLTURNs and automation that make our customers more flexible, efficient, and profitable.

Sustainability is also becoming a key focus of development. Reducing emissions, optimizing resources, and managing raw materials are no longer optional. WFL has long operated with this in mind. The Austrian industrial environment, which is strongly focused on energy efficiency, has fostered a culture in which sustainability is not a marketing gimmick, but a lived reality. And the exceptional service life of WFL machines plays a key role in drastically reducing their environmental impact.

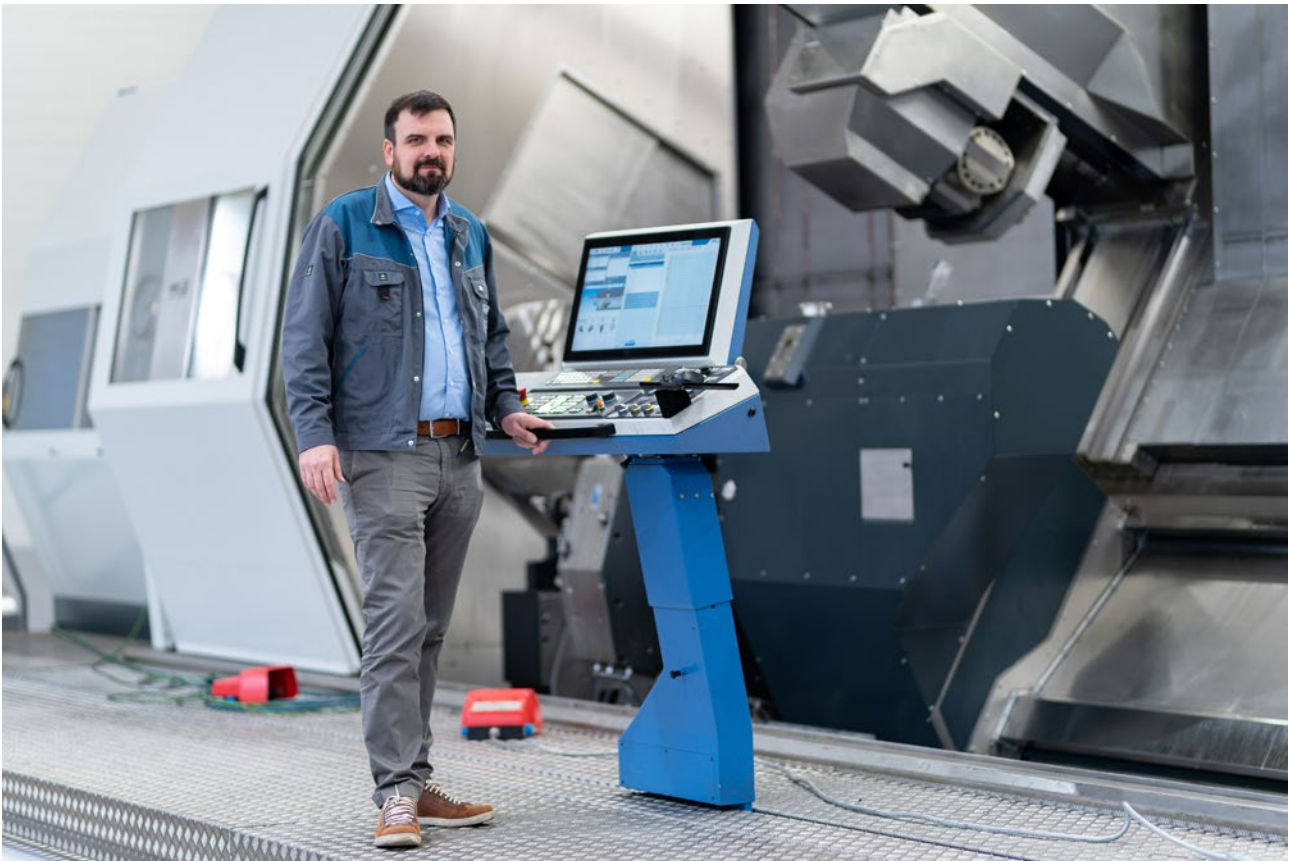
Pre-development and testing:

Between idea, machine and customer

Günther Siegwart's field of work lies at the intersection of ideas, market requirements and technical feasibility: in testing. He knows that only by testing ideas under real-world conditions can one develop truly robust, field-ready solutions. In our interview, he provides an insight into his day-to-day work, the challenges of the testing world and why patience and customer feedback are among the most important tools.



For Günther Siegwart, it is clear that new solutions must not only work under ideal conditions, but must also be reliably durable in order to be included in the product portfolio.



His biggest lesson in his job so far: taking greater account of customer views and putting himself in the machine operator's shoes.

What do you focus on in pre-development – and how does this differ from traditional Research & Development?

Siegwart: Pre-development involves exploring the technical limits of a system and identifying the physical operating principles best suited to a particular problem. Typical questions include: Can an ultrasonic inspection be implemented on a MILLTURN? Which technical systems are suitable? Ideally, I test the concepts in preliminary trials before they move on to detailed development. I also deal with market studies and customer requirements.

What makes experimental work particularly exciting for you?

Siegwart: The high practical component. I spend around 40 to 60 per cent of my time directly at the MILLTURN. There, new assemblies are tested, performance limits are explored and components are tested under extreme conditions. The aim is to ensure that new solutions not only function under ideal conditions, but are also reliably durable and can later be incorporated into the product portfolio without hesitation.

Can you give some examples of such tests?

Siegwart: A current example is the testing of a MILLTURN motor spindle with a speed of 20,000 revolutions per minute – this speed must be reliably achieved and maintained under real-world conditions. This also includes long-term tests of other components such as chain magazines, hydraulic actuators, etc., lasting from several weeks to several months. In doing so, we examine factors such as wear and operational behaviour, service life and thermal stability.

What technological topics are currently the focus of attention?

Siegwart: At the moment, I am working on, among other things, performance turning tests, the contour accuracy of a B-axis swivel gearbox and grinding tests, as well as the operational behaviour of various cooled attachment tools. Another topic is a new concept for collet adjustment under load, which is currently being implemented in collaboration with the design department. Challenges relating to purchased parts also play a major role in my day-to-day work. Here, I work closely with suppliers to find satisfactory solu-



His responsibilities also include assessing how the machine's geometric behaviour affects metal cutting, or the resulting displacement caused by thermal influences.

tions for all parties involved in the value chain and for our customers as end-users.

What types of tests do you carry out on MILLTURN machines?

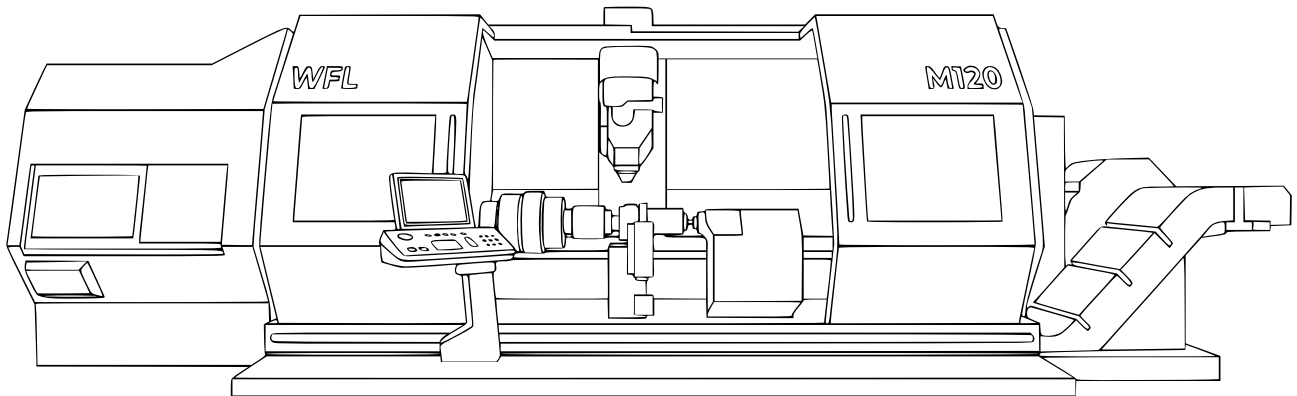
Siegwart: The tasks essentially fall into the following categories:

- Performance and stress tests to analyse the thermal behaviour of individual components. A thermal imaging camera and various temperature-measuring devices are used for this purpose. Typically, a test setup is constructed and then examined to determine which components are subject to particularly high thermal stress, whether the cooling system is balanced, whether voltages or noticeable temperature gradients arise within the assemblies, and what cooling capacity is required from the cooling unit.
- Secondly, investigations into the machine's geometric behaviour during metal cutting or the resulting displacement caused by the thermal influences described above.

- Thirdly, optimisations in the area of control and regulation, in which the system is deliberately pushed to its limits through parameter variation in machining tests, so that the ideal operating points for an assembly or a process can subsequently be derived.

What are the biggest challenges here?

Siegwart: One of the biggest challenges is to fully grasp a problem intellectually whilst at the same time not losing sight of a solution that can be realised within the given system limits. Sometimes, the search for the right lever to pull is like Sisyphus's labour, particularly when dealing with complex vibration issues. There are moments of frustration, but also great feelings of achievement when a technical challenge has been solved in a sustainable way. It is important not to merely treat the symptoms, but to eliminate the root cause of the problem permanently. Prerequisites for the work include, alongside a sound theoretical understanding of technical interrelationships, curiosity and a commitment to lifelong learning, as well as a certain resilience and tenacity.



Often, Plan A is not feasible in practice, even if the solution appears logical on paper. There is a constant conflict between theory and practice. For example, because factors may come into play that were not considered in the theoretical analysis or whose significance was underestimated beforehand.

What does your day-to-day work involve?

Sieglwart: 40% involves interventions for project-related issues, a further 40% involves field testing of components from Research & Development, and 20% consists of theoretical feasibility or market studies.

What has been the biggest lesson you've learnt in your career so far?

Sieglwart: The most important lesson I've learnt in my career so far is to take the customer's perspective very much into account right from the Research & Development stage. In the Research & Development office, there is a tendency to apply and solve problems on the assumption of idealised conditions. However, for a product to be fit for the field, it is essential to take production conditions, the end-user's perspective and even foreseeable operator errors into account right from the design phase: how resilient does the solution need to be to be truly fit for the field? Discussions with fitters and users are therefore essential.

What trends do you see in turning, boring and milling technology and complete machining?

Sieglwart: Machines must become increasingly reliable whilst also being easier to operate – and not solely because of the increasingly acute shortage of skilled workers. Smart automation solutions and user guidance are becoming far more important. Consequently, topics such as digital products, AI-supported assistance functions, or predictive maintenance based on pattern recognition of the operating data available as by-products in the machine tool sector will offer significant added value in the future. Even if many of these applications are still purely visionary due to the greatly overestimated state of the art.

Do you have a personal vision for your future at WFL?

Sieglwart: The silo mentality established in mechanical engineering must be broken down. I would like to see an even more holistic approach to Research & Development. Mechanical engineering, control and electrical engineering, installation and Applications Engineering must work together on solutions right from the start. The early involvement of all disciplines promotes elegant, lean and practical solutions, which are given less scope in a Research & Development organisation operating according to the waterfall principle.

What helps you recharge your batteries in your spare time?

Sieglwart: My partner, hiking and spending time in nature.

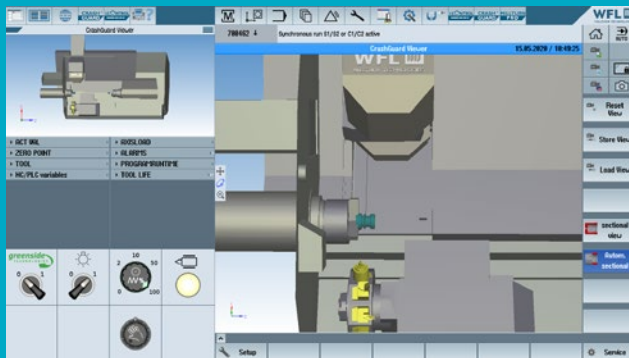


Smart software for maximum performance on your MILLTURN

On the following pages, we will take a look at WFL software solutions and the benefits of having them supplied directly by the machine manufacturer:

- WFL software perfectly tailored to the MILLTURN (MillturnPRO, CrashGuard Studio and CrashGuard)
- Convenient programming on a PC and at the machine control panel
- Extensive range of standard and special technologies
- Significant reduction in programming effort with WFL technology cycles
- Sophisticated solutions for process optimisation and maximising process reliability
- Tool requirements analysis for improved tool management
- Ready for the future thanks to excellent connectivity

DID YOU KNOW?



CrashGuard Studio – collision prevention starts at your desk

CrashGuard Studio is an innovative tool for the CAD-CAM-NC process chain. With the CrashGuard Studio 3D simulation, CNC programs in DIN code, including all WFL cycles, are verified in advance on the PC and optimised with ease. This prevents collisions before they occur. In combination with the established CrashGuard online safety system, maximum safety and optimal data consistency are ensured in both manual and automatic mode.

Simulate applications for machining on the PC!

Verifying an NC program on a PC is more cost-effective than doing so directly on the machine. The CrashGuard Studio 3D simulation realistically simulates the application of the workpiece in advance – programs can be easily improved in terms of efficiency and machine safety. Particularly on machines with a counter-spindle, where two machining slides are in use simultaneously, these can be optimally coordinated to avoid prolonged downtime.

The CrashGuard Studio visualisation tool complements CAD/CAM systems and is therefore fully compatible with them. Data for tools, fixtures, etc. can be added as required and is incorporated into the integrated CrashGuard collision prevention system.

Online collision prevention versus offline simulation?

Online collision prevention and offline simulation are not mutually exclusive – but rather an ideal complement, offering two benefits in one.

The effort required by the user to create 3D models for tools, fixtures, workpieces and script files yields a twofold benefit:

- on one hand, improved quality of new NC programs, resulting in a significantly reduced run-in time on the machine thanks to pre-simulation with CrashGuard Studio, and

- on the other hand, optimal machine protection in both automatic mode and manual operation thanks to CrashGuard.

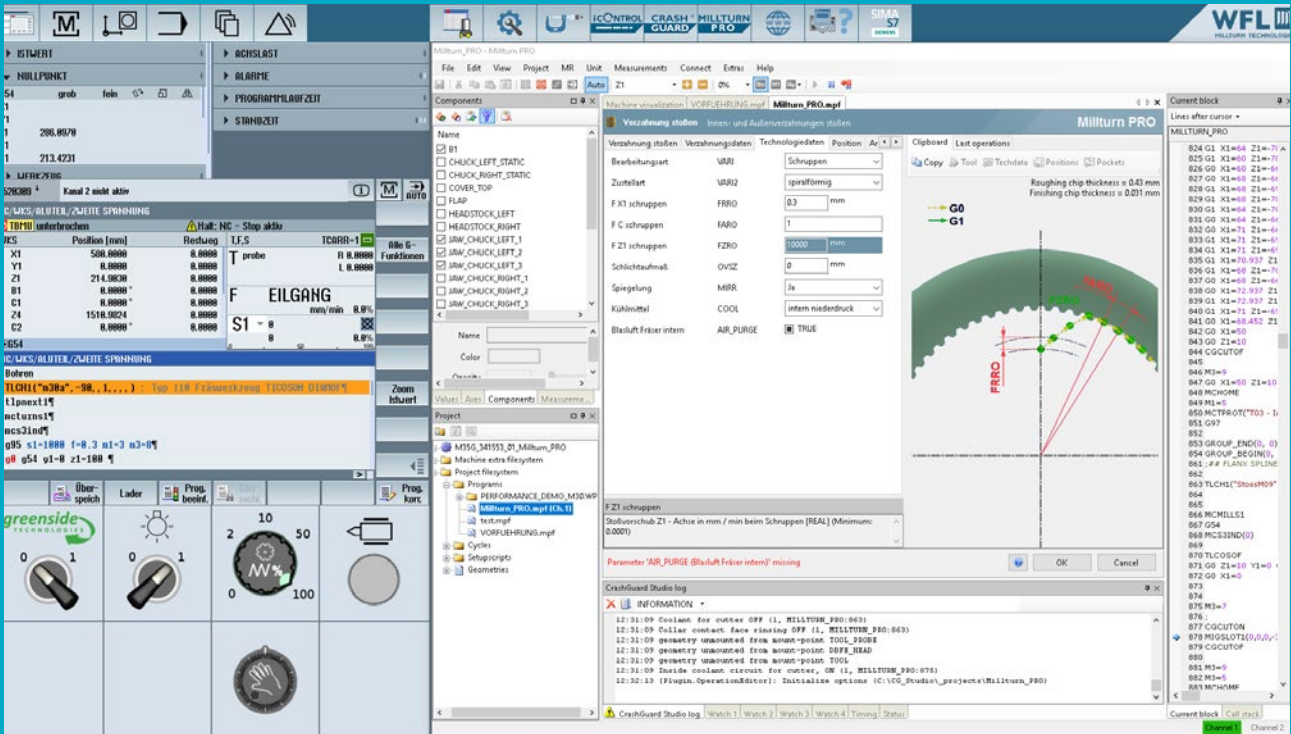
Integrated protection is irreplaceable!

An effective overall concept for collision prevention therefore contributes directly to increased efficiency and is thus of economic benefit to the user.

CrashGuard Studio counteracts poor programming right at the desk, ensuring the machine operator receives an error-free program.

However, experience shows that collisions occur not only when running new machining programmes, but above all when resuming operation after program interruptions or manual interventions. CrashGuard, the 'online' version of CrashGuard Studio, closes these security gaps. The patented software solution is integrated directly into the CNC control.

On multifunctional turning-boring-milling centres, collisions can cause significant financial damage. The probability of a collision is higher than on simple standard machines due to complex motion sequences. High-quality workpieces are often applied using specialised and expensive custom tools – the costs of a production stoppage can therefore be considerable.



The graphically interactive programming editor Millturn PRO was developed for NC programming to enable efficient and effortless creation of programs. This makes the MILLTURN a universal programming system for demanding workpieces. Millturn PRO is available in the control panel version and additionally for the PC. Other benefits include the simple creation of tool requirement lists, the improved user interface in NC programs with text folding, and the step-by-step verification of the machining process with integrated simulation.

The system is designed so that even users without in-depth NC programming expertise can quickly become productive. This is achieved through an intuitive dialogue box, pre-set sensible parameters, time-saving technology cycles from WFL, and a graphical preview of the applications. This results in significantly reduced programming time and, consequently, greater efficiency.

Millturn PRO can be used in conjunction with CrashGuard Studio. In this combination, the NC code is not only generated but also simulated and checked step by step – for example, to check for collisions or errors before the program runs on the machine.

- Millturn PRO – Programme creation
- CrashGuard Studio – 3D Simulation & Op
- CrashGuard – Collision prevention softwa
- ScrewCAM – Specialised software for bolts & special workpieces
- Tool and process data management – for better tool control & production data

Aerzen relies on WFL's automated MILLTURN technology

Aerzen's machines and units are used wherever air and gases are conveyed or compressed – from water and wastewater treatment and pneumatics to chemical and process engineering, the food industry, and the cement and lime industries. The list of applications is diverse and covers virtually all industrial sectors. There are now ten WFL M65 MILLTURNs at the headquarters in Aerzen. The first machines were commissioned as early as 2007 – a successful concept that has been consistently developed further. This is demonstrated by the last two M65 MILLTURNs purchased, which feature automation via loading robots and pallet storage from Kardex.



The two M65 MILLTURNs with automation and storage tower are Aerzen's latest acquisitions.



The robot with a yoke gripper is firmly anchored to the floor and is larger than usual due to the required radius between the two M65 MILLTURNs. With these dimensions, the robot can theoretically handle a load of up to 800 kg.

The history of Aerzen is the history of rotary lobe blowers. In 1868, the company built Europe's first such blower, thereby introducing the technology to the European mainland; in 1911, the first turbo blowers; in 1943, the first screw compressors; and in 2010, the world's first rotary lobe compressor. Now in its fourth generation, the company in Lower Saxony has retained its family-run and medium-sized business character. Today, more than 2,600 employees across over 50 subsidiaries are working on new solutions for energy-efficient, sustainable and reliable compression technology. At Aerzen, you will find the right product for every process, whether it be a screw blower, rotary lobe blower, screw compressor or turbo blower.

Blower and compressor technology with the highest precision

A highlight in the modern production hall is the fully automated machining cell featuring two M65 MILLTURNs, a Kardex lift and an ABB industrial robot with a bin-picking system. The machines are primarily used to manufacture rotors for rotary lobe blowers. These products are mainly installed in the Delta Blower series. These versatile and compact units can be used in any climate zone on Earth. Production covers small to medium profile sizes. The workpieces are mainly made from C45 and EN-GJS-500-7 materials. In theory, the entire Aerzen product range at this site – namely screw blowers and screw compressors – can be produced on the MILLTURNs. Delta Hybrid rotors are also planned for the plant in the future.

"The main challenge in metal cutting the components is the application of grey cast iron. This is because it is important to remove the cast skin with sufficient cutting depth. Grey cast iron tends to exhibit unpredictable variations in

hardness between different batches. Due to the nature of the components, each of our rotary lobes has interrupted cuts, which place a particularly heavy load on the tool and the machine. The large wrap-around of our profile milling cutters places particular strain on the tool spindle. That is why we opted for a 55 kW spindle here, in order to achieve stable and precise results," emphasises Tobias Krebs, Team Leader for the Mechanical Application. Batch sizes on this plant range from 22 to 44. In some cases, several orders of the same type are produced consecutively to further minimise the already short set-up process. The axial and radial runout accuracies are 0.02 mm, and the machining tolerance is also 0.02 mm.

Automated production with integrated ERP and tool management

One challenge in Research & Development for the automation system was the interface between the ERP (Enterprise Resource Planning) system and the host computer, which was needed to automatically identify orders. The operator approves the order in SAP, and it is automatically assigned to the machine. The forklift operator then delivers the pallets of blank parts and the corresponding pallets of finished parts; the machine operator selects the order, and the robot first retrieves its blank part from the relevant pallet via bin picking. It then retrieves its program from the tool management system – another interface in the machining process, in this case to Tool Doc. Here, the host computer checks whether there is sufficient material in the Kardex lift, i.e. whether all tools are present and have sufficient service life. Once the status check is successful, the program is started. The robot then retrieves the blank via bin picking and places it on the pre-storage area. It measures the position of the finished part pallet, which has been preset by the operator.



The Kardex lift has a total of twelve bays. Theoretically, one tonne can be accommodated per pallet; in the current application, the load is 800 kilograms.



Project Manager Tjard Körber, Mechanical Machining Team Leader Tobias Krebs and WFL Sales Representative Andreas Rose during an on-site inspection of the plant at Aerzen.

The doors of the M65 MILLTURN's working area open, the blank is clamped into the machine, and the program then starts automatically. The same process is carried out on the second M65 MILLTURN. This creates a fully digitised process – from order creation through application to storage in the Kardexlift with twelve storage slots.

The CAD programme used, Excapt+, has been in use on WFL machines for many years. This is also the case with the new plant. Programmer Sören Reinhardt emphasises: "The programme is already a well-established system that works very well. Individual commands for the robot required some fine-tuning – this necessitated a dedicated interface."

The move towards automation

With automation, Aerzen has achieved a significant increase in efficiency. Whilst the actual machining times have increased slightly due to automatic position detection, waiting times caused by manual operation have been almost completely eliminated. The robot, firmly anchored to the floor, is ready as soon as the machine door opens – the workpiece is changed immediately, and the process continues without interruption. Visually, the blank has three different flanges. Therefore, the alignment must be precise so that the robot

can recognise it and lift it with the yoke gripper. It takes between 24 and 40 minutes to go from the blank to the finished part in the MILLTURN.

"Bin picking emerged from the feasibility study. Without this feature, we would not have been able to realise this project to our specifications," emphasises Tobias Krebs. He continues: "The bin-picking system has the advantage that we can leave our blanks on the Euro pallets as they are delivered, without having to pre-sort them separately. Accurately identifying the position of the blank parts on the pallet is of immense importance and presented us with a challenge. As parts are often very close together, the bin-picking software required significant optimisation." "Ultimately, the decision was made in favour of the Kardexlift, as it requires significantly less space compared to other solutions. We also save on unnecessary forklift journeys," says Krebs.

The plant was purchased to expand capacity, although this is not yet necessary. In future, the plant is set to operate 24/7. Due to the fact that Aerzen has one or more Duplo tools for each tool to minimise downtime, the 90-position tool magazine is almost reaching its limits.



The blank has three blades. The alignment must therefore be precise so that the robot can work with the yoke gripper.



This blower comes from the WFL-cell .



A total of ten M65 MILLTURNs are located in Aerzen's production halls.



Aerzen was founded in 1864 and is located in the town of Aerzen near Hamelin (Germany).

In addition to productivity, ergonomics also plays a central role: many workpieces weigh several hundred kilograms. Automated handling significantly reduces the physical strain on skilled workers and thus contributes to long-term job security.

Proven technology, trusted partner

Aerzen has relied on WFL's MILLTURN machines for almost 20 years. According to Tobias Krebs, the most important requirement placed on the machines for manufacturing the workpiece is: "In short, complete machining in a single clamping." Project Manager Tjard Körber adds: "We know exactly what we're getting – robust machines that you can rely on. What's more, thanks to our many years of experience with the MILLTURNs, our operators and maintenance staff are thoroughly familiar with the technology. There's a reason why we've purchased five M65 MILLTURNs over the last three years."

Operator Anton Wanner also highlights the positive experience with the machines. He has been working on the MILLTURNs for 15 years: "The handling is good, innovative and simple. Thanks to the automation, there are few manual steps required, and the Kardex system is excellent."

"The collaboration with WFL went very well. The team was competent, solution-oriented and always available. Even when faced with unexpected challenges, they reacted quickly and pragmatically. This significantly simplified the entire commissioning process," says Tobias Krebs.

In conversation, Tobias Krebs and Tjard Körber also highlight WFL's exemplary service: "Another definite selling point for WFL is after-sales service. Both the support provided by WFL colleagues when problems arise and the availability of spare parts work flawlessly. Most parts are delivered within 24 hours – it doesn't get any better than that," says Tjard Körber. Thanks to WFL's rapid delivery times, Aerzen only maintains a spare parts stock for a few items that can be replaced quickly.

With WFL's automated MILLTURN manufacturing, Aerzen has taken its production processes to a new level: greater efficiency, improved ergonomics, maximum process reliability and a fully digital information flow. The partnership with WFL stands for trust, quality and innovative strength – a combination that has been successfully guiding Aerzen into the future for almost two decades.

AE0: Aerospace Competences

The aerospace industry is one of the most technologically demanding sectors worldwide. The highest quality standards, maximum process reliability, and the machining of complex, safety-critical components place extreme demands on machines, technologies, and expertise. In the aerospace sector in particular, integrated manufacturing solutions are becoming increasingly important to ensure precision, efficiency, and reproducibility at the highest level.

WFL's complete machining solution offers ideal conditions for this. By combining turning, milling, drilling, and grinding in a single setup, highly complex aerospace components can be manufactured economically and with process reliability. Especially for large, rotationally symmetric, or structurally complex components, a MILLTURN enables a significant reduction in cycle times and manual intervention.

Typical applications in the aerospace industry include the machining of difficult-to-machine materials such as titanium and nickel-based alloys, high-strength steels, or special aluminum alloys. These materials are essential for lightweight construction, temperature resistance, and structural

strength. However, they place the highest demands on machining strategies, tool technology, and machine stability. WFL machines offer the necessary rigidity, performance, and precision to reliably machine even the most demanding geometries and tightest tolerances.

Thanks to in-depth aerospace expertise, modern automation concepts, and process-integrated measurement technology, WFL's complete machining solutions form a future-proof foundation for innovative solutions in the aerospace sector, ranging from prototypes and small-batch production to the series production of safety-critical high-end components.



MILLTURN – The first choice for the aerospace industry

Small batch sizes of complex workpieces made of high-temperature-resistant metals are common in the aerospace industry. Here, maximum precision and process-reliable manufacturing of complex geometries are particularly in demand. The diverse technological challenges of these machining processes usually require specially adapted solutions. With cost-effective manufacturing as the goal, the superiority of complete machining is particularly evident in this industry.

Internal machining solutions

1. **Deep-hole drilling tool**
Rotating, with coolant supply
2. **Deep-hole drilling tool**
Non-rotating, for centered holes
3. **CNC contour boring bar**
Rotating, with radial feed (valve seat machining)
4. **CNC contour boring bar**
Non-rotating, with radial control (bottle boring)
5. **CNC face turning head**
Rotating, with radial control
6. **Internal machining tool**
Driven, for internal machining (milling, tapping, deburring, ...)
7. **Boring bar**
High length-to-diameter ratio, vibration-damped
8. **WFL system boring bar**
For various cutting heads, automatic head change
9. **Angle head**
Driven for axial machining (milling, tapping, deburring, etc.)





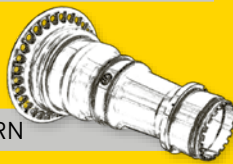
Turbine shaft

Machine:	M100 MILLTURN
MILLTURN-Technology:	6 clampings
Material:	HRSA
Dimension:	Ø=295 mm, L=1750 mm
Time:	19,5h (without loading/unloading)



Stub shaft

Machine:	M60 MILLTURN
MILLTURN-Technology:	2 clampings
Material:	Steel (1400N/mm²)
Dimension:	Ø=500 mm, L=680 mm
Time:	4h (without loading/unloading)



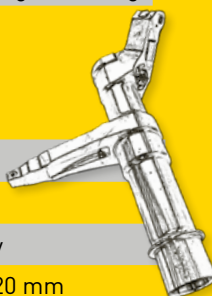
Bearing ring

Machine:	M40 MILLTURN
MILLTURN-Technology:	4 clampings
Material:	Inconel 718
Dimension:	Ø=250 mm, L=85 mm
Time:	5h (without loading/unloading)



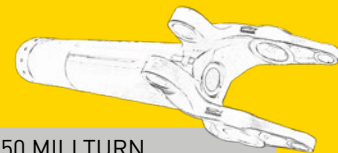
Flap lever

Machine:	M80 MILLTURN
MILLTURN-Technology:	2 clampings
Material:	Aluminium-alloy
Dimension:	Ø=750 mm, L=920 mm
Time:	2,2h (without loading/unloading)



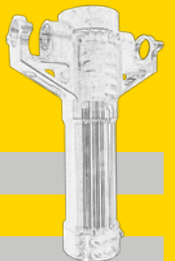
Slider, main landing gear

Machine:	M150 MILLTURN
MILLTURN-Technology:	4 clampings
Material:	Titan 5553
Dimension:	Ø=650 mm, L=2200 mm



Steering cylinder, nose landing gear

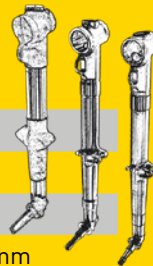
Machine:	M65 MILLTURN
MILLTURN-Technology:	4 clampings
Material:	Steel SAE 4340
Dimension:	Ø=380 mm, L=517 mm
Time:	6,6h (without loading/unloading)





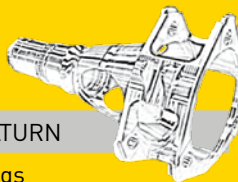
Trailing arm, main landing gear

Machine:	M80 MILLTURN
MILLTURN-Technology:	4 clampings
Material:	Steel 300M
Dimension:	Ø=500 mm, L=1500 mm
Time:	28h (without loading/unloading)



Tail rotor shaft

Machine:	M65 MILLTURN
MILLTURN-Technology:	5 clampings
Material:	Stainless Steel 15-5PH 48 HRC
Dimension:	Ø=400 mm, L=600 mm
Time:	22h (without loading/unloading)



Rotor head

Machine:	M65 MILLTURN
MILLTURN-Technology:	6 clampings
Material:	Titan alloy
Dimension:	Ø=600 mm, L=210 mm
Time:	30h (without loading/unloading)



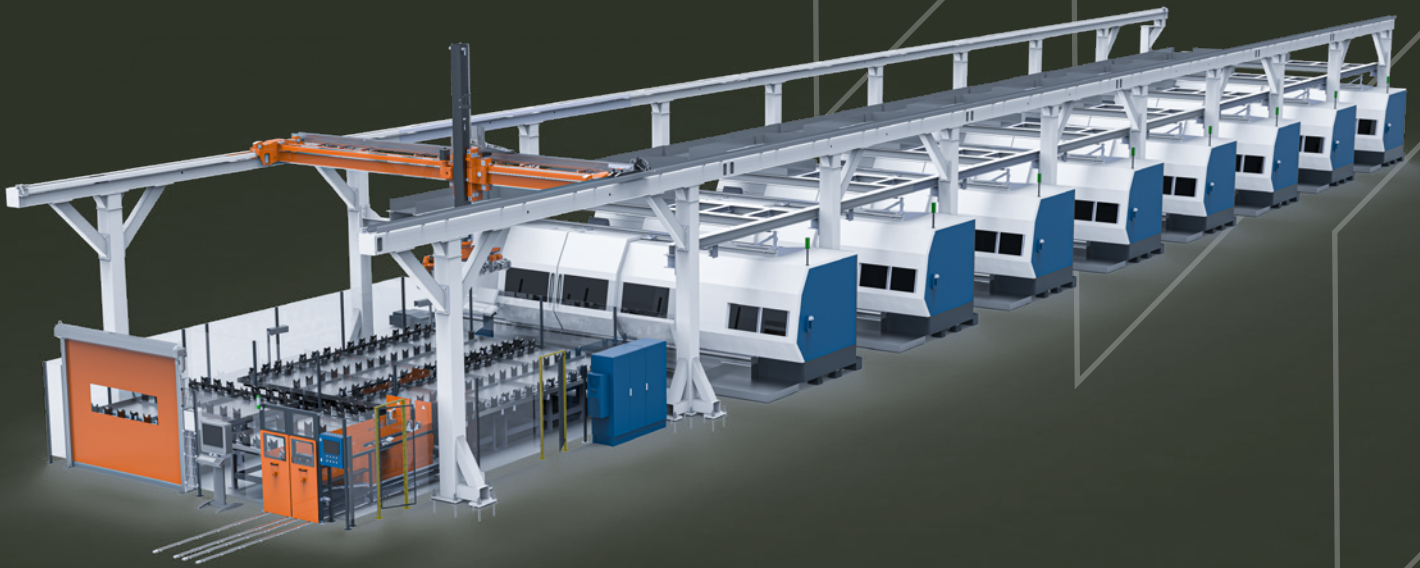
Complete machining of chuck parts

The complete machining of chuck parts for the aerospace industry is one of WFL's core competencies. A MILLTURN performs complex machining tasks of this kind with high productivity and precision. For chuck parts with diameters that are often equal to or many times larger than the workpiece length, WFL has developed a competitive advantage over the years. Among the most suitable chuck parts are "discs" and "rings."

The latest developments enable the complete machining of chuck parts up to 2000 mm in diameter.

Advantages of machining chuck parts in a MILLTURN

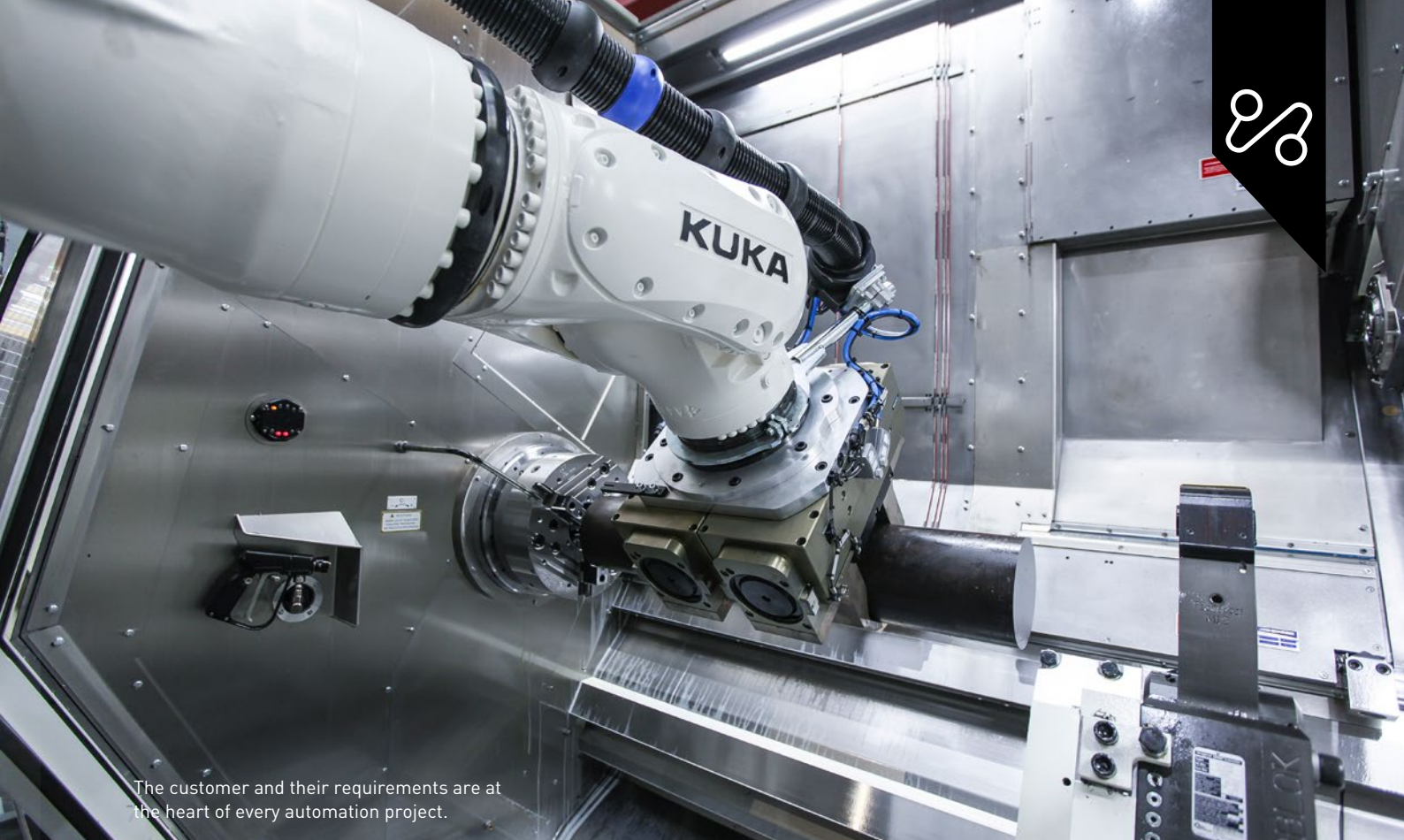
- Single clamping – complete machining
- Highly productive 4-axis complete machining of disc-shaped chuck parts
- Cutting force compensation via opposing tools for thin-walled workpieces
- Setup of fixtures and workpieces during machining time
- Fast and precise fixture change including the workpiece inside the machine
- Optimal chip flow
- Use of multiple tools simultaneously
- Machining of fit holes with very tight positional tolerances
- Process monitoring
- Manual, semi-automatic, or automatic loading
- Significant increase in productivity through maximum coolant pressures and reduced tool wear (for stainless steel materials), coolant supply
- HPC/UHPC (up to 350 bar)
- Automatic change of all tools and measuring probes
- Large magazine capacity
- Maximum productivity and quality
- Automatic concentricity and roundness measurement with scanning probe
- Turn-milling, as an alternative to turning, for interrupted cutting or severe imbalance
- Process design and turnkey solutions from WFL
- Long-term accuracy and durability



WFL Automation Solutions:

Intelligent automation as the key to competitive manufacturing

The demands placed on modern manufacturing companies are increasing rapidly: greater flexibility, consistent process reliability, and maximum output are no longer optional extras, but requirement. WFL Automation Solutions has been meeting these challenges for years with intelligent, tailor-made automation concepts — consistently positioning itself as a solution provider for the manufacturing industry of tomorrow.



The customer and their requirements are at the heart of every automation project.

Rising personnel costs, increasing international competitive pressure, and the demand to operate machines efficiently around the clock make automation indispensable for many companies across all industries. At the same time, the world of work is changing: night and weekend work are becoming less attractive, while expectations for productivity and delivery capabilities continue to grow. Automation closes this gap – and enables cost-effective 24/7 production.

From machine manufacturer to solutions provider

Today's customers expect much more than a single machine. They want turnkey production systems that map processes holistically and secure long-term competitive advantages. WFL recognized this change early on and therefore attaches great importance to well-thought-out automation concepts – both for new systems and for the expansion of existing systems.

The goal is clearly defined: to reduce production costs, increase output, and secure jobs at the same time. Because automation does not mean staff cuts, but rather qualification. Experience shows that the requirement profile is changing – toward skilled workers who understand, control, and optimize complex turnkey processes.

Customized solutions instead of standard concepts

The focus of every automation solution is on the customer—and their actual requirements. "Customers usually know what they want, but not always what they really need," explains Manfred Fahrion, Director Turnkey-Projects / WFL Automation Solutions. Only through intensive dialogue can we determine which automation concept will be efficient in the long term. Customers are often surprised by the potential that modern automation offers today – far beyond simple loading and unloading.

That's why our solutions are always developed in close cooperation with the customer. The experience and expertise of the future operators are also incorporated into the development. This allows different levels of complexity to be realized – always according to the principle: Keep it simple. Processes are simplified, productivity is increased, and complexity is reduced in a targeted manner.

A structured path to turnkey automation

It takes around twelve months from order placement to commissioning at WFL. After the order is received, all requirements are precisely defined in a detailed design phase lasting two to three months. This is followed by the implementation and production phase at the St. Konrad plant. The



Manfred Fahrion, Director Turnkey-Projects / WFL Automation Solutions

automation system is then installed, tested, and approved at WFL in Linz. After successful approval, it is transported to the customer and set up and finally commissioned on site.

Limits? None so far.

“To date, we have not encountered any limits to automation in any of our projects,” says Manfred Fahrion. Almost everything required for the respective application is technically feasible. Although there are still physical limits in robotics — for example, with very high payloads or limited space—WFL always works with the customer to find alternative solutions that are optimally tailored to the respective production environment.

Intelligent communication and predictive data usage

Intelligent communication is a key element of WFL automation. This takes place on three levels: fixed communication, basic communication, and a higher-level host system for comprehensive data acquisition. Not only is the status of the machine monitored, but predictive planning is also carried out.

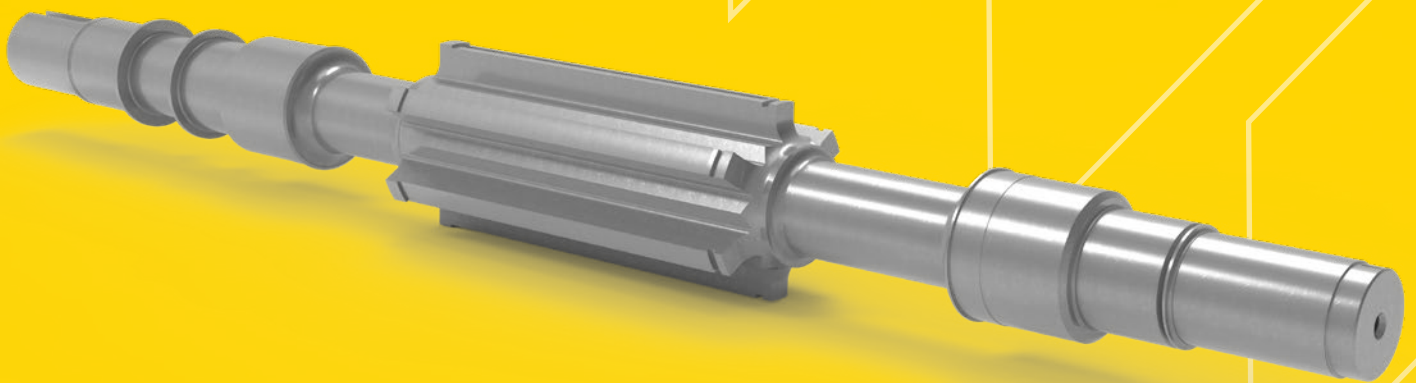
The system checks, for example, the tool magazine, tool availability, and remaining service life, and compares this

with the NC program. Only when all requirements are met is a workpiece automatically loaded. Otherwise, the next component is selected from the queue. After machining, the robot takes over unloading. Depending on the signal sent by the machine, the robot or gantry places the finished workpiece in the storage area or rejects it – with optional manual rechecking by the operator.

More than technology: experience, process knowledge, and future-proofing

WFL not only supplies automation technology, but also a holistic concept. This includes proven processes, in-depth experience from numerous projects, and expertise in how machines and automation interact optimally. The result is solutions that provide lasting relief, reduce production costs, and ensure long-term competitiveness.

An additional effect: modern automation is not only efficient but also makes a strong visual statement. State-of-the-art technology in your own production hall inspires employees, customers, and potential skilled workers alike – and impressively demonstrates that your company is moving with the times.



Generator shafts – the unsung heroes of power generation

Nothing works without them: generator shafts are key components in modern energy and drive systems. Whether in wind turbines, power stations or sophisticated machines – they are subjected to immense stress, must demonstrate the highest precision and function reliably under extreme conditions. But how are these complex shafts produced, what demands do industry and technology place on their manufacture, and what role does complete machining play in modern production technology? In this article, we take you on a journey from material selection through high-precision manufacturing processes to the finished product, which delivers top performance day in, day out.

ALL EYES ON

Complete machining of generator shafts is used wherever there are high demands on dimensional accuracy, concentric running, operational reliability and cost-effectiveness. Typical applications are found primarily in power generation, such as generator shafts for wind turbines, hydroelectric power stations, and steam, gas and diesel power stations. Here, the shafts must transmit high torques and operate reliably under constantly changing loads.

Furthermore, complete machining is used in mechanical and plant engineering, particularly for industrial and emergency power generators, test bench applications and special-purpose generators. This manufacturing method is also widespread in marine and offshore technology, for example in ship generators or offshore wind turbines, as it ensures high process reliability and reproducible quality in addition to cost-effectiveness.

How does the application work?

The stress-relieved blank for generator shafts is often delivered to the MILLTURN pre-turned and with welded-on webs. It is particularly important during the application of the welded-on webs that the blank is aligned circumferentially so that the allowance for the welded-on webs is centred as effectively as possible. Using the WFL measuring cycles, this blank measurement is carried out fully automatically, whereby even welding defects can be corrected. In the shaft area, angled holes must be placed, which meet the deep-hole hole in the centre. All holes can be placed in the MILLTURN without a fixture, whilst the rounding of the hole edges is also carried out very quickly and with high repeatability. The outside diameter of the webs, which must be machined with precision, is finished to IT7 fit quality using turn-milling and milling. Bearing seats on the journals are turned to the finished dimensions with the highest precision, and the surface finish is then brought up to the required drawing specifications using finishing processes, e.g. roll finishing. WFL in-process measuring guarantees process reliability even with the tightest manufacturing tolerances.

However, it is not only welded generator shafts that can be produced economically on the MILLTURN; some customers prefer to apply a saw-cut section to solid stock for the application of the shafts. The heavy and torsionally rigid machine bed, the generously dimensioned guide systems and the powerful drives offer optimal conditions for efficiently handling this task as well.

Advantages of the MILLTURN

Production on the MILLTURN offers numerous advantages, as multiple machining steps can be carried out on a single machine. This significantly reduces machining operations, minimises set-up time and reduces space requirements. At the same time, labour costs are reduced, whilst shape

and position tolerances can be maintained more accurately than with separate machining operations. The labour- and time-intensive re-clamping and aligning of the workpiece between the various machining steps is largely eliminated; furthermore, continuous process monitoring with WFL iControl, as well as in-process measurement and closed-loop corrections, ensure high process reliability, consistently high quality and prevent costly scrap.

Limitless possibilities

The blank is pre-turned and then, after welding, placed into the MILLTURN, where automatic circumferential orientation is carried out during the programme run using a probe via WFL measurement cycles. Alternatively, solid stock is used. The bearing seats in the shaft areas are rough- and finish-turned, or turn-milled. Where necessary, subsequent finishing processes are used to improve the surface finish. Similarly, the outside diameter at the welded ribs and the longitudinal grooves are rough- and finish-turned and milled in interrupted cuts, achieving the highest angular accuracy of the ribs relative to one another. The groove widths are machined to exact dimensions, supported by integrated workpiece measurement using the WFL measurement cycle package.

Process chain



Potential savings in the application of generator shafts





Precision from the black forest:

Kammerer Gewindetechnik relies on MILLTURN technology from WFL

For more than 75 years, Kammerer Gewindetechnik GmbH & Co. KG from Hornberg-Niederwasser has stood for the highest precision in the conversion of turning to linear motion. The third-generation family business employs around 150 people and is one of the most sought-after experts in ball screw drives, linear guides and customised screw drives. Its components are found in sectors such as automotive engineering, medical technology, mechanical engineering and the packaging industry – wherever precise movements are essential. To ensure it can meet this standard in the long term, Kammerer has relied on MILLTURN technology from WFL for several years. Following excellent experiences with an M40 MILLTURN, the company decided to take the next step: investing in an M30-G, including automation and a storage tower.



The M30-G MILLTURN with automation and storage tower has been in the production hall at Kammerer Gewindetechnik since 2025.

For Kammerer, the decision to opt for another MILLTURN from WFL was the result of many years of experience and clear technical requirements. In the manufacture of high-precision ball screw nuts, process reliability, repeatability and machine stability are crucial – factors in which WFL has consistently excelled for years. “Our ball screw nuts require extreme precision. The tolerance between the thread pitch and the deflection system in particular is a real challenge – here, hundredths of a millimetre determine whether a part works or is rejected,” says Martin Huber, Lean Manager at Kammerer.

The M40 MILLTURN, in use since 2021, had already demonstrated that even the most complex thread profiles and tight tolerances can be achieved with exceptional precision. Added to this is the holistic approach of WFL Millturn Technologies: machine and automation from a single source, which significantly simplifies integration and minimises risks. For Kammerer, this means: a single point of contact, a seamless system and maximum process reliability.

Complex machining process

The ball nuts manufactured in the M30-G MILLTURN are predominantly made of 100CrMo7 or, in the food sector, of 1.4112 stainless steel. The application involves complex machining: first, the outer contour is machined, then a through-hole is drilled and a thread is cut. Pockets are then milled and edges deburred. Afterwards the outer contour is applied again and – depending on the design – a deflection system is installed. This is followed by drilling holes for

connections and lubrication points. Finally, an articulated robot removes the workpiece, places it in the storage tower and inserts a new workpiece. The major challenge here is achieving the required accuracy of the thread pitch and deflection system. Tolerances of ± 0.015 mm must be maintained across multiple layers.

Automation: Greater capacity, lower resource requirements

With the introduction of the M30-G, Kammerer has established a fully automated manufacturing process that contributes significantly to increased efficiency. The WFL machine is equipped with a Kardex storage tower capable of holding up to 300 workpieces across 28 shelves. When changing part types, which alters the dimensions of the raw and finished parts, an automatic jaw change on the main and counter spindles is carried out reliably.

This allows the entire machining process to be handled continuously and automatically from a quantity of 1. For a company that primarily manufactures batch sizes of between ten and 15 ball screw nuts, this flexibility is a decisive competitive advantage. The high process stability is also evident in the quality: with 600 parts now manufactured on the MILLTURN, there have been only six scraps – proof of the plant’s reproducible precision.

In practice, the plant’s potential is particularly evident: the M30-G can produce autonomously for up to 21 hours. “We have already run the plant independently once from 3 pm on



Ball screw nuts are manufactured on the MILLTURN.



The positive experience with the M40 MILLTURN in recent years has prompted the decision to opt for another MILLTURN.

Friday until midday on Saturday. The machine was switched off at midday on Saturday – who knows how long it would have continued producing,” emphasises Huber.

Thanks to automation, operators have additional capacity as they can simultaneously attend to other machines or processes. For Kammerer, therefore, automation means not only higher productivity, but also stability, predictability and the ability to deliver consistently high quality despite limited staff resources. Together, WFL technology and automation form the basis for reliable, future-oriented manufacturing that consistently meets customers’ high demands.

This is precisely where Kammerer benefits from the strengths of the MILLTURNS. Huber sums it up: “The WFL gives us the stability and accuracy that we wouldn’t otherwise achieve. Tools that don’t work on other machines run smoothly here.” This makes the M30-G the centrepiece of a flexible, high-precision production process.

Precision, stability and process reliability

Production is supported by a well-designed CAD/CAM set-up. Kammerer programmes his workpieces using TopSolid, including post-processors for the MILLTURNS. On the M40 MILLTURN, just as on the M30-G MILLTURN, the WFL thread-cutting cycle is programmed, along with all standard conventional measuring cycles.

The fact that the decision to purchase once again fell on a MILLTURN is not only due to the outstanding performance of the M40 MILLTURN, but also to the synergy of the partnership. “It is excellent that we can place our process knowledge to use on this major project and that WFL brings its many years of experience in optimising processes to bear. It’s a wonderful synergy where everyone learns from everyone else,” says Martin Huber with conviction.

Equally noteworthy is the expert knowledge of WFL Customer Services. Kammerer praises the fast response times, expert solutions and rapid availability of spare parts – an

aspect that can be crucial in day-to-day operations.

For Kammerer, this is a key element in being able to produce both customised one-off items and recurring series with consistently high quality – economically, reliably and sustainably. “In WFL, we have a reliable partner who understands our requirements – and with whom we will continue to grow in the future,” says Lean Manager Martin Huber.

The WFL-Kammerer cycle

Some of the ball screw drives manufactured are in turn used in WFL machines, such as recently in the M200 MILLTURN. These ball screw drives are characterised by a specially adapted pitch, which allows the use of a larger ball profile. This enables them to withstand higher axial loads within a compact installation space. The innovative design ensures performance, durability and, at the same time, space-saving. This makes the components suitable for demanding applications in machine tool manufacturing, where precision and load-bearing capacity are crucial.

Kammerer ball screws come into play during axis movement: they convert a rotational movement into a linear movement with zero play and high dynamics. The drive components must meet the highest standards of precision and speed. With repeatable accuracy and precision, they ensure the positioning accuracy of the axes and exact tool guidance, which is particularly important for complex milling or drilling operations. The high efficiency and low friction of the spindles ensure fast traverse movements whilst maintaining low energy consumption.

Sustainability – responsibility in action at Kammerer

At Kammerer, sustainability is not a trend, but a corporate practice that has been in place for many years. The focus is on the responsible use of resources – from production and Logistics Operations right through to internal processes. A key component is the consistent use of retrofit solutions: whether for machines, the storage system or the tool dispensing station. Software and control systems have been modernised.



In the energy sector, too, Kammerer focuses on long-term efficiency. A photovoltaic system, in operation for over 20 years and now generating around 100 kW, supplies large parts of the production facility with self-generated electricity. This is complemented by a comprehensive energy and environmental management system. The company has held environmental certification for over 10 years. Sensors monitor the consumption of every machine and every area to identify potential savings at an early stage. Peak loads – for example in summer – are automatically smoothed out by temporarily switching off systems such as the air conditioning or adjusting their output.

Sustainability is also evident in the day-to-day handling of materials: packaging cardboard is shredded on-site by a service provider, filled into bags and reused as packing material. Customers can also reuse this material, thereby closing loops and significantly reducing waste. At the same time, communication and documentation processes are being systematically digitised, which considerably reduces paper consumption.

Through this combination of technical modernisation, intelligent energy optimisation and resource-efficient processes, Kammerer succeeds in combining environmental responsibility with economic efficiency – and embedding sustainability permanently within the company.

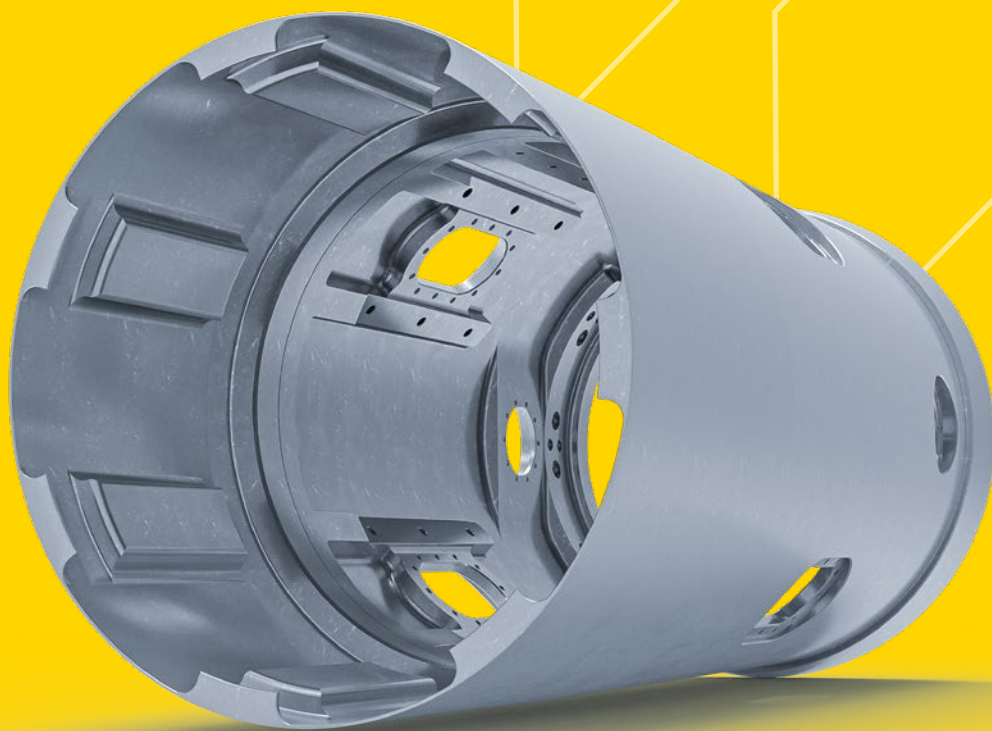
Equally important: a modern and attractive working environment for skilled workers and apprentices. “Digitalisation and automation are crucial today for attracting and retaining good staff in the long term,” says Lean Manager Martin Huber with conviction.

The history of the Hornberg-based company

Founded in 1938 by Anna and Franz Kammerer, the company quickly became a pioneer. As early as 1946, Kammerer manufactured the world’s smallest watch movement, followed in 1962 by the first manual turning machine capable of thread whirling. In the decades that followed, the company increasingly specialised in threading technology, expanded its production facilities, professionalised manufacturing processes and established quality and environmental certifications (ISO 9001 since 1996, EMAS for over ten years).

Today, the production facilities cover more than 8,500 m². In 2014, the company opened a second production hall for its automotive division, and in 2017, it switched to line-oriented production with optimised material flow.

The appetite for investment remains strong: whether it’s overhead lines for coolant supply, software solutions or expansions of the production areas – Kammerer keeps moving forward.

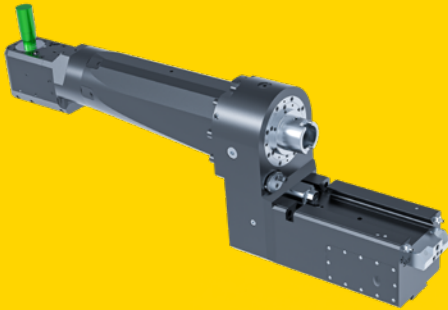


New high-performance angular head with automatic tool change

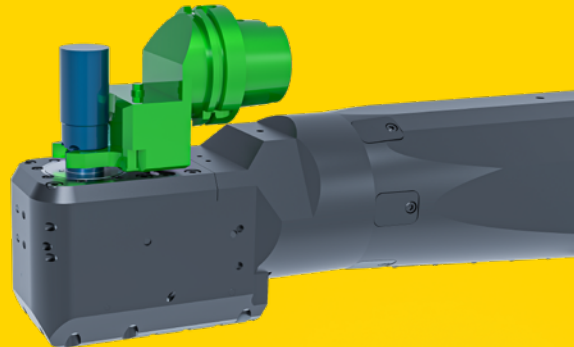
**for the cost-effective internal machining of
aluminium components**

A specially developed angular head with integrated automatic tool change has been developed for the highly productive internal machining of complex aluminium components. The solution combines an HSK-A32 tool interface, a hydraulically operated clamping mechanism, a rotating media interface for hydraulics and electrics, and an oil-mist-lubricated high-speed bearing.

ALL EYES ON



The angular head is based on an HSK-A32 interface. Its distinctive feature is the integration of a hydraulically operated tool clamp within the 90° unit.



The tools are mounted in a 90° orientation using cost-effective adapters. This allows standard HSK A32 tools to be used without the need for special versions. The tool change is automated on the machine side.

The angular head achieves speeds of up to 12,000 rpm in continuous operation and allows the automated use of over 20 different tools within a single machining process. In conjunction with a simultaneously interpolating B-axis, a new machining strategy has also been implemented to significantly reduce the number of passes for radius geometries.

Automatic tool change in the angular head

At the heart of Research & Development is a special tool interface based on HSK-A32. Unlike conventional angular heads, the new version features an integrated automatic tool clamping device that hydraulically clamps and releases the tool. This enables fully automatic tool change directly in the angular head.

The tools are supplied via the machine's standard tool magazine. Using cost-effective adapter sleeves, HSK-A32 tools can be automatically changed into the angular head in a 90° orientation. A mechanically operated clamping mechanism handles the precise positioning and clamping of the tool.

Whilst conventional angular heads must be loaded manually, this solution allows for an uninterrupted machining process – a decisive advantage for complex workpieces requiring extensive internal machining.

Media interface for hydraulics, electrics and lubrication

The integration of the automatic tool clamping mechanism requires a specially developed media interface. This interface transmits all necessary media – hydraulics, electrical power and lubrication – to the rotating angular head.

A key design feature is oil mist lubrication (minimum quantity lubrication). Standard angular heads with grease lubrication reach their limits at high speeds and under continuous load. The new design, however, enables speeds of up to 12,000 rpm in continuous operation.

The oil mist unit required for this is integrated directly into the machine periphery. The expertise behind this technology stems from many years of experience with oil mist-lubricated drive trains in the turning-boring-milling unit and has been specifically applied to the angular head.

Designed for high-performance machining of aluminium

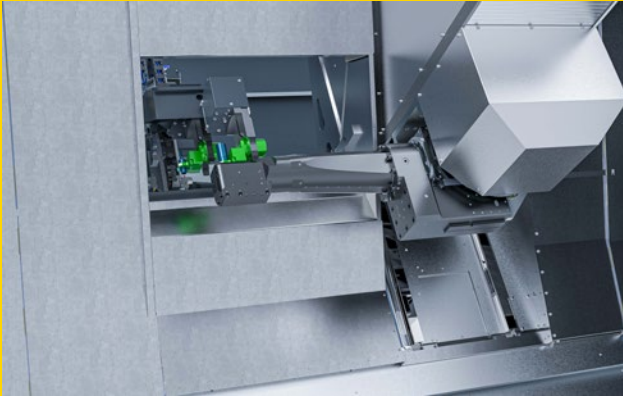
Research & Development was specifically designed for large-volume aluminium components with complex internal geometries. In one particular project, over 20 different tools are used – for milling, drilling, reaming and thread-cutting operations within a single workpiece.

Aluminium allows for high cutting speeds, but at the same time places high demands on machine dynamics and process stability.

Only through the combination of:

- high speed (12,000 rpm in continuous operation)
- automatic tool change
- optimised lubrication
- stable coolant supply

does the cost-effective production of such components become possible.



Tool changes from the tool magazine are carried out via the tool change flap directly onto the angular head.



In the standard tool magazine, the various tools are stored in the adapter and can be accessed automatically.

Innovative machining strategy with B-axis combination

An additional efficiency gain is achieved by combining the angular head with the machine's B-axis. Instead of conventional radius machining using ball nose type cutters and numerous narrow feed paths, a new strategy has been developed:

The angular head is specifically tilted via the B-axis so that larger cutters can be used, which produce the specified workpiece geometry with significantly fewer passes. This significantly reduces machining time – whilst maintaining the same surface quality. This intelligent milling solution makes optimum use of the machine's degrees of freedom and enables massive time savings compared to conventional methods.

Custom design instead of a catalogue solution

The angular head developed is not a standard product. Dimensions, geometry and design are adapted to the specific project. WFL Millturn Technologies has decades of expertise in Research & Development for special-purpose tools and is now consistently applying this experience to demanding milling applications using angular heads with automatic tool change.

Depending on the workpiece, special clamping technologies are also used to prevent deformation in thin-walled or

weight-reduced components. In a recent project, for example, a 120 kg aluminium blank was used for metal cutting to produce a 12 kg finished part – an extreme case that places the highest demands on clamping technology and process control.

Conclusion

With the new high-performance angular head, WFL is pushing the boundaries of cost-effective internal machining. The combination of automatic tool change, integrated media interface and oil-mist-lubricated high-speed design enables:

- fully automated internal machining
- the use of over 20 tools in a single process
- Continuous operation at 12,000 rpm
- significant reduction in machining time
- cost-effective production of complex aluminium components

In Applications Engineering, the solution is designed for large-volume, geometrically complex workpieces. The solution demonstrates how significant productivity gains can be achieved through the consistent integration of mechanics, media handling, lubrication technology and machining strategy.

Spare parts: Global Power by the Numbers

Most spare parts are ordered as part of scheduled maintenance or repair work and do not need to arrive at the customer's location within a day. In these cases, what matters most are precisely planned delivery times that are ideal and transparent for the customer, high availability, and reliable commitments. Additional expedited processes are available for time-critical situations. Global warehouse locations and coordinated processes throughout the entire supply chain ensure that spare parts can be delivered at short notice when needed—worldwide and on a predictable schedule.

5500

Shipments per year.

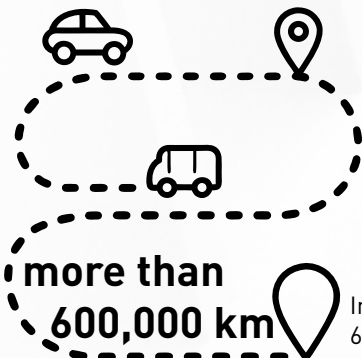
In 2025 5,525 shipments were processed - reliably, on time, worldwide.



Spare parts availability is a key factor in customer satisfaction and equipment uptime at WFL.

80,000

Materials were delivered to our customers in 2025.



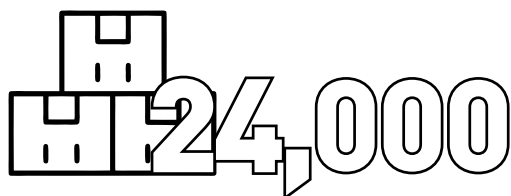
**more than
600,000 km**

In 2025, we traveled more than 600,000 km on behalf of our customers.

178,000 kg

Shipment volume (including packaging)

has been shipped worldwide through our service.



Spare parts are always in stock.

From standard components to critical assemblies—so that repairs can begin without delay.



To ensure that every replacement part reaches the customer quickly, numerous departments work hand in hand.

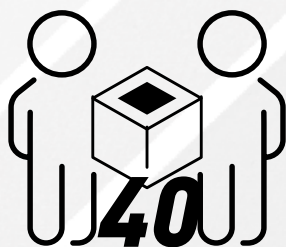
Our promise: Maximum availability. Worldwide. Reliable.

When machine performance matters, the supply of spare parts must not be a source of uncertainty. That is why, with exceptionally high availability, short lead times, and a strong global network, we ensure that spare parts are not only available quickly—but also arrive at your location in a predictable, transparent, and reliable manner.

Our international locations and well-established processes guarantee smooth operations—worldwide. At the same time, we bring extensive expertise in complex specialized processes, allowing us to address your concerns promptly and on a case-by-case basis.

Furthermore, we actively support our customers with all related tasks, such as customs clearance or specific export requirements. This is how we lay the foundation for short lead times and a spare parts supply you can rely on at all times.

So your production runs smoothly. Without detours. Without delays.



Specialists in our supply chain work every day to minimize downtime and improve processes.



Availability and On-Time-Delivery



In addition to Austria, three other warehouses in China, the United States, and India ensure that customers receive their replacement parts quickly and reliably.

Thanks to these global warehouses, our delivery times are efficient and fast: 1–2 days in Europe and 3–4 days worldwide.



Connecting Continents

An interview with Praveen Kurup,
General Manager at WFL.

Discover how our team in India drives innovations, connects across borders, and contributed to WFL's global success

How is the office organized (departments, responsibilities, management)?

The Indian office operates with a lean and efficient structure. It is organized into Sales, Service, Application Engineering, Accounting, and Administration, all managed under a centralized country management approach to ensure quick decision-making and close customer interaction.

Which market trends are currently influencing business?

Key market trends influencing business include:

- Increasing demand for complete machining solutions
- Focus on automation and reduction of human intervention

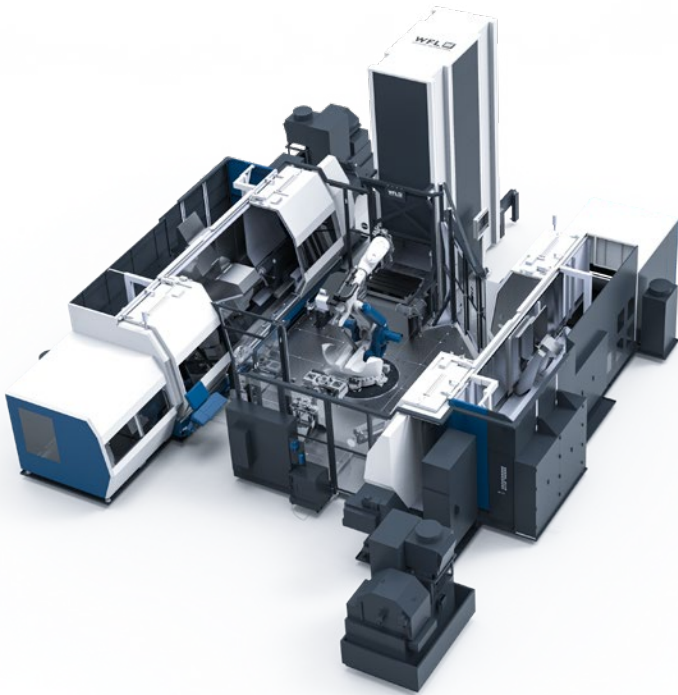
- Strong emphasis on cost efficiency, productivity, and quality
- Growing preference for local manufacturing under "Make in India" initiatives
- Rising demand for machining of advanced and difficult-to-cut materials

Which industries are particularly relevant in the market?

The most relevant industries in the Indian market are Aero-space and Defence, Oil & Gas, Energy and Power Generation, heavy Engineering and Plastics and Polymer Machinery.



General Manager Praveen Kurup provides insights into the Indian market and its customers.



There is growing demand for complete automation solutions worldwide, including in India.



Hakan Koc, Head of Sales Middle East & India with General Manager Praveen Kurup.

Are there any regional characteristics?

Yes, the Indian market has distinct regional characteristics:

- Strong emphasis on cost justification and return on investment
- Preference for long-term partnerships and relationship-based business
- Regulatory encouragement through local manufacturing policies
- Diverse customer maturity levels, requiring customized technical and commercial approaches

What developments are currently shaping the industry?

The industry is being shaped by:

- Rapid digitalization and adoption of Industry 4.0 concepts
- Increasing focus on automation and unmanned machining
- Stricter quality, traceability, and compliance requirements, especially in aerospace and energy sectors

How strong is the competitive pressure?

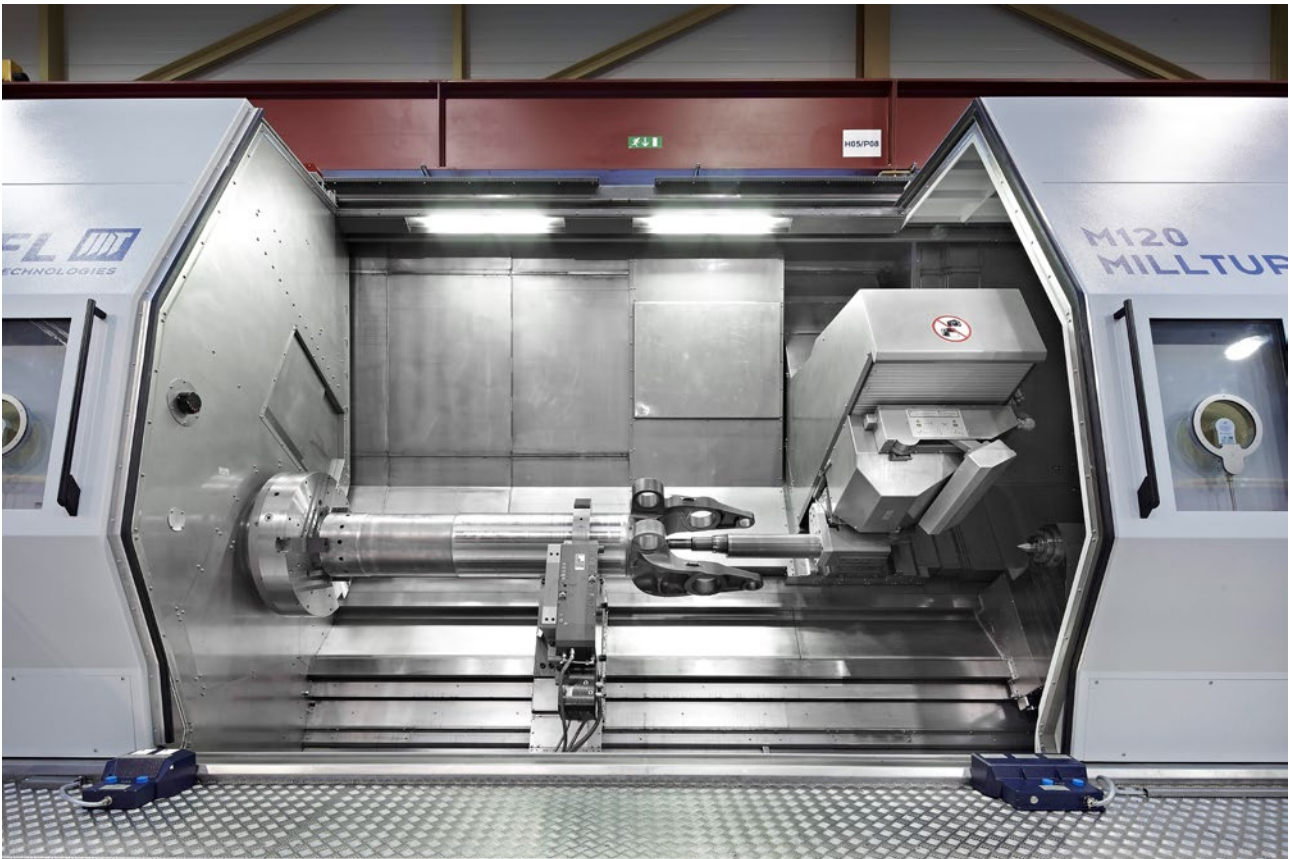
Competitive pressure is high, with strong presence of Japanese, Korean, and European machine tool manufacturers. However, WFL's complete machining capability and technological differentiation provide a strong competitive advantage in high-end applications.

How satisfied are customers?

Customer satisfaction is high, particularly among customers who have adopted WFL solutions for complex and critical components. Customers value machine performance, quality consistency, and long-term reliability.

Which MILLTURN models are selling particularly well?

In the Indian market, medium to large-sized MILLTURN M50 to M120 models with complete machining capability are receiving strong interest, especially configurations with automation, gear machining, and counter-spindle options, driven by aerospace, energy, and oil & gas applications.



The MILLTURNs M50 to M120 are attracting interest from Indian customers in the aerospace industry.

How satisfied are you with the trade fair activities in your country?

Trade fair participation has been satisfactory and improved last year. It has helped increase brand visibility, customer awareness, and lead generation, particularly among high-end manufacturing customers.

How important are trade fairs for your region?

Trade fairs are very important in India as they enable direct interaction with decision-makers, help demonstrate technology leadership, support market education for advanced machining concepts and strengthen brand presence in a competitive environment.

What are the branch's long-term goals?

The long-term goals of the Indian branch include:

- Strengthening market presence and brand recognition
- Expanding the sales and service team
- Increasing local application and service capabilities
- Growing installations across aerospace,

energy, and heavy engineering sectors

- Establishing India as a strategic long-term market for WFL

Which new markets could still be tapped?

Potential new markets include:

- Defence manufacturing and space programs
- Renewable energy sectors (wind, hydrogen, nuclear support industries)
- Large automotive and e-mobility components
- Mining and infrastructure equipment
- High-precision plastic and polymer processing machinery



Portal loader with multiple interlinking.

Technology Meeting at WFL:

**Trade visitors from the metal cutting industry
experience innovation up close**

From 5 to 7 May 2026, WFL Millturn Technologies invites to the Technology Meeting at its headquarters in Linz. Trade visitors from all over the world will have the opportunity to experience the latest manufacturing technologies live and exchange ideas with industry experts. The event will focus on innovative solutions for modern metal cutting, the latest research and development in MILLTURN technology and practical applications along the entire process chain. Live demonstrations on machines, technical presentations and personal discussions will provide immediate insight into the performance and future prospects of modern manufacturing.



The last Technology Meeting two years ago attracted numerous interested visitors.

The WFL Technology Meeting is aimed at international trade visitors from industry, Research & Development who want to find out about trends in complete machining, automation solutions and digital manufacturing strategies. Direct exchange with WFL specialists creates clear added value for decision-makers and users alike.

The in-house exhibition offers the opportunity to experience the full range of metal cutting capabilities in live demonstrations on machines of all sizes – from the M20 to the M150 MILLTURN. Visitors can also find out about WFL software solutions, manufacturing solutions and retrofit machines.

Unfold new possibilities with the M70 MILLTURN

A special highlight of the event is the new M70 MILLTURN. The latest generation of multifunctional turning-boring-milling machines combines the capabilities of a powerful turning machine, a high-precision 5-axis machining center and, depending on requirements, a gear cutting or deep drilling machine. The M70 is designed for very large and heavy workpieces. It can accommodate parts with a center distance of up to 8,000 mm, a maximum swing diameter of 850 mm and a workpiece weight of up to 5.5 tonnes. The machine therefore covers an exceptionally wide range of

applications – from long shafts and solid housings to complex chuck parts.

The main spindle delivers up to 5,860 Newton meters of torque and reaches speeds of up to 2,500 revolutions per minute. This torque corresponds approximately to the combined power of around 20 modern car engines. The robust cast spindle housing, stable spindle bearing and backlash-free holding brake guarantee maximum rigidity – even in applications where difficult-to-cut materials such as Inconel or titanium are used. The milling unit delivers up to 58 kilowatts, reaches 8,000 revolutions per minute and a maximum torque of 640 Newton meters. Particularly noteworthy feature is the interpolating B-axis with a swivel range of 220 degrees and a holding torque of 15,000 Newton meters. This makes the M70 suitable for long and heavy boring bars, which are held in a stable prism interface. The milling spindle is also equipped with an internal coolant supply of up to 200 bar, which guarantees excellent machining conditions even for deep hole drilling.

Despite these dimensions, the M70 MILLTURN achieves maximum precision. This is achieved on the one hand by high-resolution direct measuring systems in all axes and a structurally optimized machine frame made of solid grey



The M70 MILLTURN is the latest addition to the MILLTURN product family and will be on display at the Technology Meeting.



Whether small batch sizes or large series, simple turned parts or complex components such as crank shafts – the M70 covers everything in a single machine.

cast iron with integrated vibration damping. On the other hand, it is achieved by intelligent measuring technologies: with integrated measuring probes, workpieces can be measured directly in the working area and deviations can be corrected automatically. In addition, the iControl software ensures continuous monitoring of cutting force, which enables maximum process reliability even in unmanned production.

In summary, the M70 MILLTURN is particularly interesting for WFL customers due to its maximum flexibility in production. Whether small batch sizes or large series, simple turned parts or complex components such as crank shafts – the M70 covers everything in a single machine. It reduces changeovers, shortens lead times and, at the same time, increases process reliability. For WFL customers, this means higher productivity, lower costs and a sustainable investment in the future.

Intelligent automation

Another focus of the WFL Technology Meeting is on automation solutions. The M70 MILLTURN is designed for continuous 24/7 production. Many other WFL machine models also increase output and reduce production costs through automation. WFL offers tailor-made automation solutions – because every automation solution is tailored to the customer's specific requirements. Only through intensive dialogue can it be determined which automation concept is efficient in the long term. Customers are often surprised by the potential that modern automation offers today – far beyond simple loading and unloading. Today's customers expect much more than a single machine. They want turn-key production systems that map processes holistically and secure long-term competitive advantages. WFL therefore attaches great importance to well-thought-out automation concepts – both for new systems and for the expansion of existing systems.



WFL therefore attaches great importance to well-thought-out automation concepts – both for new systems and for the expansion of existing systems.

The goal of automation is clear: to reduce production costs, increase output and secure jobs at the same time. Because automation does not mean staff cuts, but rather qualification. Experience shows that the requirement profile is changing – towards skilled specialists who understand, control and optimize complex turnkey processes.

At the in-house exhibition in Linz, visitors can see automation solutions for themselves in person and live on site. For example, multiple interlinking can be viewed. This automation solution takes productivity to a new level. Real manufacturing scenarios are used to show how machining steps are seamlessly linked together. The live demonstrations illustrate how continuous processes without manual intervention increase productivity, reduce idle time and ensure consistently high component quality. At the same time, it becomes clear how intelligent control concepts and coordinated automation solutions guarantee maximum process

reliability. Visitors will gain first-hand insight into the efficiency, flexibility and cost-effectiveness of WFL's integrated manufacturing solutions. The articulated robot will also be in use, demonstrating how intelligent robotics can be seamlessly integrated into highly automated manufacturing solutions. WFL's automation experts will be available to answer questions from interested parties throughout the three days of the Technology Meeting.

Further items on the agenda at the technology meeting

These exhibitors will be present at the three-day in-house exhibition: Avantec, Bechem, Blum, Boehler-it, botek, Cogsdill, Diahon, voltec, gravostar, Haimer, Hainbuch, Kennametal, Leistritz, Marh, mimatic, ISCAR Austria, Renishaw, Röhme, Sandvik coromant, Siemens, SMW Autoblok, Zoller. As usual, visitors can look forward to an exciting supporting programme this year, including multilingual tours, live demonstrations and fascinating specialist presentations.

Second-hand MILLTURNs from WFL: high-end machines at attractive prices

As precise as a new machine, but at a reduced price – retrofitted machines are more than just an alternative: they combine proven quality with economic efficiency and environmental sustainability.

The used machines undergo a complete overhaul in-house, are cleaned and thoroughly tested for accuracy and functionality. As with new machines, WFL offers unique opportu-

nities in terms of quality and customer support.

Our machines can be found on the “Machine Finder” portal, or they are offered by our sales staff as a cost-effective alternative to new machines. The machine is then adapted and specified according to the customer’s requirements. In addition, the available used machines are also featured on our website.



CLICK HERE
TO REQUEST:



Have you seen the TECtalk on automation yet?

Manfred Fahrion, Key Account Manager at WFL Automation Solutions, speaks about automation and related solutions in the latest episode of our TECtalk. He provides detailed insights into the Research & Development process for the right automation solution. The accompanying article, **“WFL Automation Solutions: Intelligent automation as the key**

to competitive manufacturing”, can be found on pages 26–29.

You can watch the TECtalk on YouTube by scanning the QR code:



WFL Academy – expertise that drives productivity

Clamp once – machine complete.

At WFL, this principle applies not only to the MILLTURN but also to our training concept. With the WFL Academy, customers receive a well-designed training programme that is precisely tailored to their machine configuration and manufacturing tasks. Ongoing training not only guarantees maximum productivity in your manufacturing operations but also boosts staff motivation and makes it easier to adapt to new manufacturing tasks. Our training programme covers all requirements for programmers, machine operators and service technicians.

Tailor-made programmer training

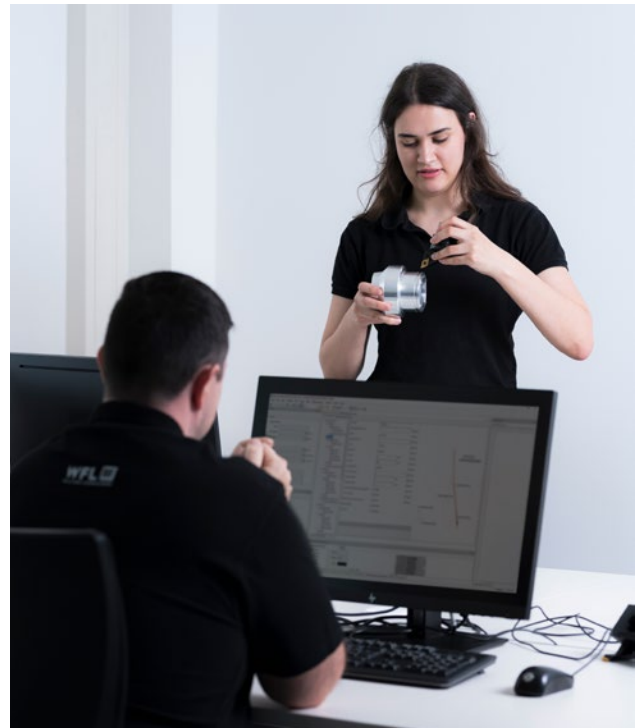
- WFL Basic Programmer Training
- WFL Advanced Programmer Training
- CrashGuard Studio
- Measurement technology
- Special cycles
- WFL iControl
- WFL GearCam
- WFL ScrewCAM
- CNC Operator Training
- WFL Individual Training
- Mechanical service training
- Electrician service training
- Maintenance instructions

Knowledge as a key to success

The WFL Academy stands for more than just the transfer of knowledge. It is a strategic partner for customers who wish to continuously develop their manufacturing processes. Af-

ter all, skilled staff are the key to utilising complex technologies efficiently, safely and cost-effectively.

With customized training, customers can unlock the full potential of their MILLTURN – from specialised tooling solutions to production support.



FACTS ABOUT THE TECHNOLOGY MEETING

4.000m²

Explore 11 MILLTURNs live

1,000 to 8,000 mm centre distance

Discover 16 software solutions

22 exhibitors on site

65 workpieces on display

Automation Solutions by WFL - Redefining efficiency

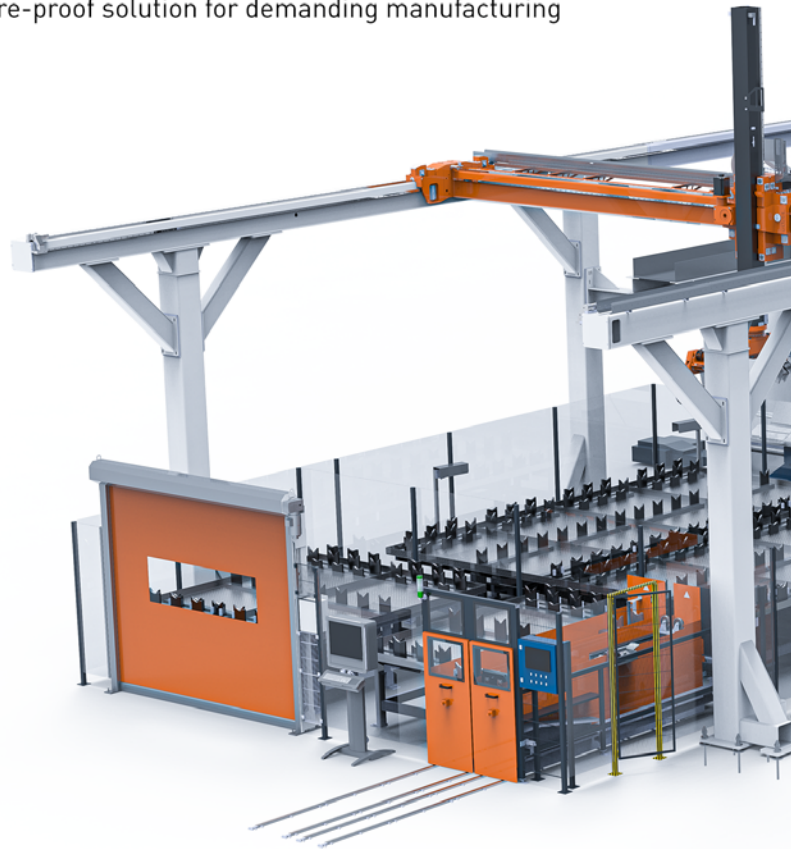
WFL's multi-machine linking connects several MILLTURN machining centers into a fully integrated, highly automated manufacturing system. Customized handling solutions, such as linear gantries, robotic systems, or dedicated transfer units, ensure precise and reliable workpiece transfer from one machine to the next. A centralized control architecture intelligently coordinates all machining operations and material flow processes.

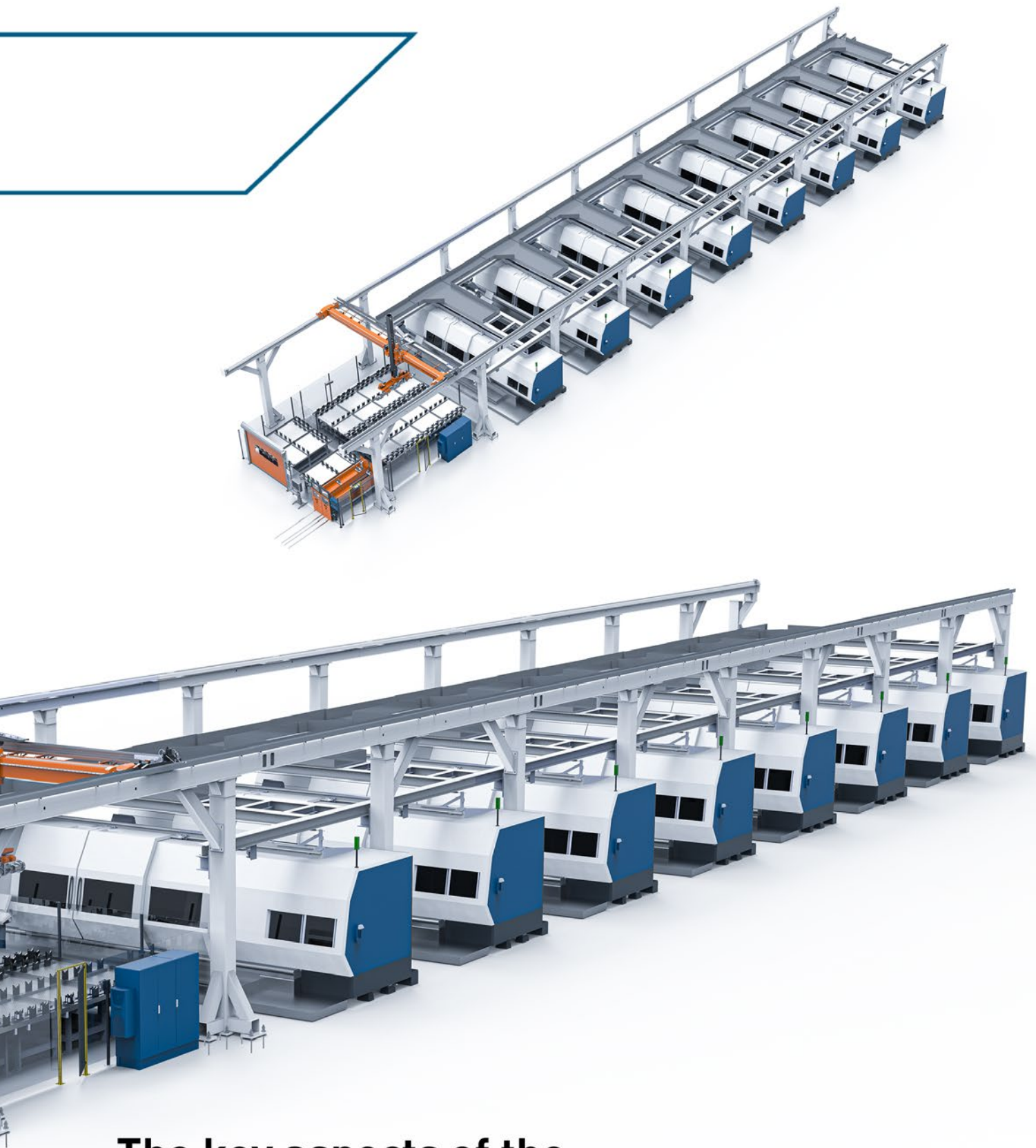
Seamless integration into WFL's automation solutions maximizes productivity, significantly reduces idle times, and increases overall system availability. Setup processes are minimized, manual intervention is reduced, and process reliability is sustainably enhanced. At the same time, continuous data transparency enables comprehensive quality monitoring and optimal utilization of the entire production line.

With multi-machine linking, WFL delivers a scalable and future-proof solution for demanding manufacturing environments - efficient, flexible, and perfectly tailored to individual customer requirements.

Area gantry automation for Millturn M50

- Gantry payload 3.150kg
- Servo gripper, no manual adjustment required
- Different parts/part-types and operations
- Part length max. 3.200mm
- Max. Part weight 1.100kg
- Part loading philosophy
- Forklift possible
- AGV possible
- Single crankshafts possible (see drawer)
- Drawer for INPUT
- Drawer for OUTPUT and measuring/inspection, incl. Motorized rotation of parts
- Warehouse with universal buffer positions
- Host controls system for optimization of machine usage (based on required tools, tool-life and NC-programs) NC-Programmen]





The key aspects of the automation concepts are

- Each machine can be in maintenance mode or loaded manually, without interrupting the automation of the rest
- Area around each machine is completely open, also complete in front ! [secured by laser scanners]
- Transport of crankshafts in a highway to the side of the machine; no parts over the top of operators
- Highly sophisticated software (HOST) selecting the best match part for each machine based on the available tools
- Automatic alarms and ordering of replacement tools to keep each machine up and running (optimization of spindle time)

»» **QUESTIONS | COMMENTS | 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 magazine „COMPLETE“ is available in German and English. Additionally a download link can be found on our homepage.



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Sabine Steinkellner

Chief editor:

Melanie Mai

Editorial team:

Sabine Steinkellner,
Gregor Luckeneder, Stefanie Wagner

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