

COMPLETE

Nr. 02/22

The complete machining magazine

[SUCCESS STORY](#) | ArianeGroup - Entering Earth's orbit more efficiently

[IN THE INTERVIEW](#) | Mobile Robot Automation with the mobileCELL

[ALL EYES ON](#) | The challenges of titanium machining



All eyes on:
The auto-
mated
MILLTURN

Holistic solutions for a
competitive production.



Innsbruck: alpine-urban

Enjoying a cappuccino in the sun with your favorite person, strolling past great works of art, exploring charming stores and winding alleys. Finding new regeneration in the mountains and nature, exploring history in special places and enjoying regional delicacies in lovely restaurants and inns. In short: discovering new things and rediscovering yourself – that is Innsbruck..

„Action is the
fundamental key
to all success.“

Pablo Picasso

Dear customers and readers,

Visitors could experience concentrated machine power live at this year's WFL Technology Meeting in Linz. The focus was on 10 different machine models presented on an exhibition area of over 4,000 m², with all machine types being represented, from the smallest and newest to the largest and heaviest. It was also important for us to familiarize our visitors with digitization at WFL. The new programs for operational data acquisition, myWFL Cockpit, myWFL Energy and myWFL Condition Monitoring, were presented live based on various use cases. The programs visualize machine and program statuses over time, productivity and technical availability on the control, a PC or a mobile device via browser. The user is thus always informed about the productivity of the machine in detail. In addition to the acquisition of production data, process monitoring is also a top priority for us. With iControl it is not only possible to design highly efficient manufacturing processes, but also to avoid downtimes or even crashes in the case of difficult machining by using learning systems.

Other important highlights this year are the new M20 MILLTURN and the mobileCELL, a mobile robot automation system that completely autonomously changes both workpieces and tools on a M65 MILLTURN. The concept enables a wide variety of expansion stages and thus also offers the greatest possible security for the future. The M20 MILLTURN shining with its new, innovative design, was also presented to the audience. On the M20-G you could experience live machining of a technologically sophisticated chuck part. Moreover, not only special gearing technologies such as gear skiving of internal and external gears as well as complex turning, boring and milling operations on the main and counter spindles, but also the automatic tool change on the two individual tool carriers were demonstrated.

In this issue of the Complete magazine, we deal with mobile robot automation (mobileCELL), machining of difficult materials, sustainability and our turning centers, the TURNS. Of course, our customer stories should not be missing either. The WFL editorial team visited the company Mikrosan located in Turkey, which specializes in the manufacture of extrusion machines,

and the company ArianeGroup, which has already manufactured some interesting components for the aerospace industry on our MILLTURNS. But we won't let go of sports either. In this issue we therefore present our testimonial Carolina Sandhofer, so you can find out what high-performance sport has to do with our machines.

Enjoy reading!

The WFL Management Team



Günther Mayr
Managing Director Sales, Technologies
and Services

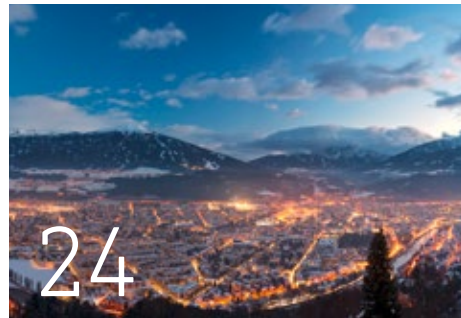
Norbert Jungreithmayr
CEO



08



16



24



30

08 | BEHIND THE SCENES
The changing face of trade
Interview with Head of Purchasing Franz Reichhart

13 | ALL EYES ON
MRA – A new dimension of automation

16 | SUCCESS STORY: ARIANEGROUP
Entering Earth`s orbit more efficiently
The prime contractor for the European Ariane launcher families manufactures the Vinci engine in the M80 MILLTURN.

21 | ALL EYES ON
T series – the WFL turning machine concept

24 | WE LOVE...
Tyrol
The special flair of the old town with its famous sights is only a breath away from the next hiking or biking tour, the next skiing ski resort or winter hiking experience.

28 | ALL EYES ON
Titanium machining – special materials in complete machining

30 | SUCCESS STORY: MIKROSAN
The right twist
Mikrosan produces extruders and screws for the plastics processing industry at a high-quality level.

34 | ALL EYES ON
Green machine

36 | INTERVIEW
Mobile Robot Automation
Interview with Sales Manager Andreas Bitzyk, FRAI Robotic Technologies and Managing Director Manfred Fahrion, Autania Engineering.

40 | PORTRAIT
Carolina Sandhofer
Man and Machine – A comparison that draws many parallels.

46 | CLOSE UP
Focal Point
The Disc Hub

– WFL Technology Meeting –
Highlights 2022



1.000 visitors

Absolute novelty: Mobile Robot Automation with the mobileCELL

4.000 m² exhibition area

21 exhibitors

10 MILLTURNs live



**ONE FOR ALL,
ALL FOR ONE**

„What I particularly appreciate about my team is their reliability. My team is a real team. Everyone complements the others and is above all helpful and reliable.“

Purchasing

The changing face of trade

An interview with
Head of Purchasing Franz Reichhart

It all began with flint stones, sea shells and cowry shells. In primeval times, these items had a value and were used for trade. Homo sapiens and Neanderthals understood the importance of trade. This economic spectacle has played a major role throughout all eras – and continues to do so today. Throughout time, these simple processes have become ever more complex, beginning with stock and goods receipt, demand for raw materials, and right through to strategic market intelligence. In the meantime, these tasks have become sophisticated strategic services.

But what does „purchasing“ mean in today’s big companies? Simply put, it is all the necessary operative and strategic activities which aim to ensure supply at an optimum price-performance ratio. Purchasing at WFL is thus always in a state of flux and tries to work according to the aforementioned definition as far as possible, skilfully maintaining a balance with a prosperous ratio.

To lead a team and direct them as a single unit, you need ability as well as talent. With great finesse and, above all, a sustainable strategic approach, Franz Reichhart, Head of Purchasing, gives us an insight into the world of trade at WFL.

Please tell us about yourself in a few words.

My name is Franz Reichhart. I am 57 years old, married with three daughters and four and a half grandchildren – one is on the way! So we are a big family. I started out as a trained lathe operator, which I learnt at voestalpine. Since I’m of an advanced age, I remember the „before-WFL“ time.

Can you tell us a bit about your milestones at WFL, throughout your career?

As mentioned, I came from voestalpine and, after completing an industrial apprenticeship as a lathe operator, I did CNC programming and attended the vocational school for foremen as a second educational career path. Afterwards, in 1992, still under Voest-Alpine-Steinel, I joined a procurement team. Purchasing production parts and parts based on drawings didn’t yet exist at that time. VOEST-Alpine-Steinel then ceased to exist and I was moved directly to join WFL’s purchasing team. So on January 1, 1994, I began my career in the WFL Purchasing division, in the Production Parts department. It was an exciting area and a manageable small group with a total of 4 employees. It was a great, and really interesting time. I worked in this department until 2008 and completed advanced training, for

example as a qualified purchasing manager. I then took over at Purchasing in 2009: but not just Purchasing, but also all materials management. This included the warehouse and dispatch. So it is a large area of responsibility, which I really enjoy managing, and above all, appreciate. In terms of milestones, in 2012 there was the purchasing portal where suppliers can obtain a range of information. That portal has been repeatedly developed and adapted. In 2014, the warehouse was then completely rebuilt. In fact gutted would probably be a better word, so that only the basic structure remained. As a result, everything was set up afresh and brought up to date. In the warehouse and dispatch department, the automatic small parts storage was set up and installed in 2018. Today this contains around 30,000 storage positions. We have many more milestones to come and we will drive these forward with maximum efficiency to ensure the best possible work and quickest possible delivery times.

On what essential values do you base your daily activities, decisions and plans?

The first is definitely trust and communication. I.e. an open approach and honest communication. These are very important building blocks for me. But it’s also



important to be aware of your responsibilities, both towards your colleagues and to the WFL product and associated suppliers. Another of my values is a solution-oriented mindset, but efficiency also plays a major role. And last but not least, appreciation, which we should always show to each other.

How does a typical day look in your department and how do you begin your day?

A rough plan can be made for the day, but this depends on the current situation. Whether it be a telephone call or important emails, internally or externally, which need to be dealt with. Pressing situations are always handled together as a team as quickly as possible. In my experience, you achieve the most with open communication.

What would you say is particularly important when working in your department?

I see our Purchasing department as a service provider, smoothing the work-

flows between the various other departments, whether that be R&D, Production, Design or Marketing. On the other side, we have our suppliers. We are the hub where everything converges and which operates in all directions. As already mentioned, it's about having the right communication and also contributing ideas; by which I mean improving processes. A standard process is good, but it's always better to allow suggestions and ideas within the company and also from outside to be taken into account. The aim is to make processes simpler, safer, more sustainable and cheaper. In the long run, this creates really strong partnerships and boosts team spirit.

How do you maintain a good work-life balance and what are your hobbies?

You definitely have to be resistant to stress to some extent. I have developed a morning Nordic walking routine which does me a lot of good and recharges my batteries. My day begins at 4.30 a.m. with

a Nordic walk, as I already mentioned. I use these 40 minutes to clear my head and begin the day full of energy. During this time, I also come up with ideas and solutions for some of the day-to-day challenges in purchasing. After these sessions, I feel completely refreshed and can start the day as needed. I live in a rural area so there's a lot of nature around me. This is my time to myself, and I enjoy this quiet time, come winter or summer. And yes... this is also my hobby, I always enjoy a lengthy run. I also like music and playing the guitar. I like to play a wide range of songs, and always have the lyrics in my head. This also helps me to de-stress and clear my head. My family also help me to find balance and are the most important thing to me. With 3 daughters and my grandchildren, and two of those daughters still living at home, there is always something going on. My grandkids are naturally quite demanding and they also give me a boost. They say, „Granddad, we're going fishing this weekend!

We need to find worms.“ And of course I'm happy to take them on a fishing trip. So this is how I keep my work and professional life separate in a way so I can recharge.

What do you appreciate about your team and where do the strengths lie in general?

I really appreciate my team's reliability. My team is a real team. Each person complements the other and is helpful and reliable. „Lone warriors“ are good but collectively a team can pool its resources at any time. In my opinion, you progress more quickly by working together. My team also has the freedom to make decisions themselves. There are certain boundaries, of course, but in principle, each person can let their ideas run free, to ensure WFL's continued success. Everyone should be able to realise their potential. I believe we have an excellent environment and will for many years to come.

How do you handle difficult decisions and situations?

Making difficult decisions is not easy. I take a pragmatic approach. If there's a far-reaching or difficult decision to be made, which may have a significant impact, I like to make a list of the pros and cons. I also like to discuss such situations with my team leaders and get other people's opinions too. I also describe the situation to people who have a neutral, non-biased view of things. In the meantime, I also take a step or two back to change my perspective and avoid tunnel vision. My view is that it's better to make a good decision than to never come to a perfect decision.

If you could improve or adapt something at WFL, what would it be?

I think there are many ideas for ongoing development, both in terms of people and the company, for strengthening WFL. In the meantime, more can be

done together again. Sports groups are being formed, and a wide range of external activities and projects which promote team spirit. So there are also discussions in the community and problems which previously often seemed impossible to solve are easily solved. Communication is, as with so many things in life, the key and here WFL is always striving to strengthen each other.

How would you describe your typical leadership style?

I think I have a very open leadership style with certain objectives or basic conditions. Discussions are always conducted at eye level with mutual respect. I demand performance and full commitment to the company from each of my employees. If they are prepared to do this, they also have a certain amount of coordinated freedom to develop and shape themselves. I support and encourage each of my employees to further



„How something is produced or the CO2 footprint of the purchase is a crucial concern as part of our purchasing activities.“

360 DEGREES

„We are the hub where everything converges and which operates in all directions.“



their professional training, and I can even say that I motivate them to complete additional training programs (language courses, specialist courses, studies). Because well-trained and motivated employees are the capital of every company. Should anyone need advice from me, be it professional or private, I am of course available.

Do you have a personal vision for the future of WFL and where do you see WFL in 5 years?

My vision focuses on development that will take us into the future. Innovation for new technologies or even enabling easier, more efficient work is probably

the key to being successful in future. Sustainability is also very important – from our suppliers, who carry out sustainable production through to the technology that we now use in our machines. We owe this to the next generation. How something is produced or the CO2 footprint of the purchase is a crucial concern as part of our purchasing activities. In-house at WFL, not only are our machines equipped with energy-saving measures, but the building itself has a photovoltaic system. We also have electric vehicles in our fleet and the WFL Retrofit programme reconditions old machines, delivering savings and sustainability. This is only the tip of the ice-

berg, however. Many new developments will gain ground and pick up pace over the course of the coming years. Whether energy saving is stipulated by law or not, we have to safeguard the future and live and work as sustainably as possible. In 5 years, there will be no way around the matter of energy efficiency, and it will probably also be a purchasing criterion. I think that the price will take somewhat of a back seat if the sustainability is right and we move towards a cleaner environment. With every step we take in this regard, both the environment and the buyer and seller can rejoice in having done something for future generations. And with a clear conscience.



„My view is that it's better to make a good decision than to never come to a perfect decision.“

PERSONAL INFORMATION

Name: **FRANZ REICHHART**

Age: 57

Home town: Tragwein

Education:

Qualified lathe operator, vocational school for foremen in mechanical and industrial engineering, CNC programming training, REFA training, qualified purchasing manager

Career:

After my apprenticeship at voestalpine, I worked as a boring machine operator. I was then a CNC programmer for CNC boring machines and gantry milling machines, after that I moved to the „Procurement of production parts“ team. In 1994, I moved to the Purchasing division at WFL, where I was responsible for the Production Parts department. In 2009, I became Head of Purchasing and the Materials Management department and have since carried out numerous projects.

All eyes on...

MRA – A new dimension in automation

by FRAI Robotic Technologies

Humanity's greatest developments are based on enabling highly effective work processes. In Ancient Egypt, workers used machinery to construct remarkable structures in a simple manner. This is a culture which understood, even back then, how important it is to simplify processes. Today, continuous progress has made its way into many industries and helps WFL to automate extensive processes.



All eyes on

Mobile Robot Automation

by FRAI Robotic Technologies



Concepts such as the mobileCELL are considered an absolute novelty, enable a wide variety of expansion stages and thus offer the greatest possible future security and competitiveness.

After gripper arm robots, linear systems, and gantry systems, another big development is now picking up pace: the MRA (Mobile Robot Automation) will soon play an important role at WFL and FRAI. One of WFL's main aims is to always be productive and to provide customers with solutions that suit their requirements. As it requires minimal operating effort and offers 24/7 productivity, Mobile Robot Automation is also suitable for smaller batch sizes. But what exactly is an MRA? This is a robot which, for example, can take blanks from storage location A to machining location B, clamps

them in a machine while also storing them in a vehicle storage location and transporting them away. The specified travel paths are fully automated and satisfy the highest safety standards to avoid any kind of collision. The vehicle also has an on-board navigation system and special load securing equipment. Its omnidirectional wheels enable sophisticated manoeuvres through narrower areas of the production hall. The MRA solutions can be operated on several machines, if the machining times are aligned with the travel paths. When it comes to design, WFL and FRAI have opted for an elegant, linear design.

The perfectly structured shape and the safety system offer protection and, above all, ensure a quick and sustained flow in production. As usual, the design goes hand in hand with ergonomic features. Accessibility and excellent handling were focal points during the development process.

The fully autonomous vehicle charges at the socket provided and is a huge boost for a company's future production. The mobileCELL from WFL and FRAI is off to a flying start, looking to the future with a combination of safety and high productivity.



The AGV (Automated Guided Vehicle) picks up the requested tools and workpieces in the warehouse, then drives in front of the machine, locks itself to the ground and changes parts and/or tools.

Advantages

- 24/7 production with minimal operating effort
- Also suitable for small batch sizes
- Ideal for repeat orders
- Customer-specific options such as outward transfer of samples, inscribing, cleaning, blank measuring, etc.
- Additional machining using robots (e.g. deburring)
- Camera-based recognition system
- Data exchange via Profibus or OPC-UA
- Space in front of the machine is completely clear
- The mobileCELL is only briefly at the machine for workpiece changes
- The mobileCELL can transport and replace both workpieces and tools
- Takes on intralogistics tasks
- Set-up station can be anywhere (not tied to the machine locally)
- The mobileCELL can incorporate upstream or downstream processes
- Washing, deburring, painting, measuring, checking, etc.
- If running times are suitably long, four machines can be automated with an MRA solution, for example

Entering Earth's orbit more efficiently

ArianeGroup is a world leader in access to space, working for its institutional and commercial customers and ensuring Europe's strategic independence.



As the lead contractor for the European launchers Ariane 5 and Ariane 6, ArianeGroup is responsible for the entire life cycle of a launcher – from design, entire production, marketing and operation through its subsidiary Arianespace. ArianeGroup has a workforce of approximately 7,000 highly-qualified people in France and Germany and is equally owned by Airbus and Safran as a joint venture. The company is also the lead contractor for the French navy's ballistic missiles. ArianeGroup and its subsidiaries are internationally recognised specialists in aerospace equipment and propulsion, services and space surveillance. Their expertise is also used in other industrial sectors and in critical infrastructure.

One of ArianeGroup's key sites is Ottobrunn near Munich. This is home to the ArianeGroup Liquid Propulsion Centre, where components for engines for European Ariane launchers are developed and produced. The focus is currently on the thrust chambers for the Ariane 6 main stage engine, the Vulcain 2.1, as well as the new re-ignitable upper stage engine, Vinci.

A glimpse into the world of space travel

Stefan Winter, Head of Production at Ottobrunn, provides us with some interesting insights during a tour of the production facilities: „We have almost 300 employees here in Ottobrunn, around 100 of whom work in production. All the processes for manufacturing our components take place in house so our lead time is very short. The majority of our processes are carried out in our production centre, from machining and welding (EB and TIG) to integration and quality testing. Electroplating and component cleaning take place in neighbouring buildings. These short distances are a huge advantage for us.“

To leave the Earth and its gravitational pull behind, a rocket needs a lot of energy. The Ariane launchers achieve this with solid rocket boosters which deliver a thrust of around 13,000 kilonewtons and lift the 800-tonne rockets off the ground in the first two minutes after launch. The main stage with the Vulcain-2 engine which is started first after the countdown provides further thrust until the rocket has reached a height of approximately 160 kilometres around nine minutes after launch. In space, the upper stage takes over. This is powered by the HM7B engine for Ariane 5 and Vinci for Ariane 6. Depending on the mission, this engine is operational for around 15 minutes to put the upper stage with the satellites in space in the correct orbit.

The thrust chamber – the „heart“ of the engine – for the Vinci engine for Ariane 6 was developed and manufactured in Ottobrunn.

Vinci works with cryogenic hydrogen and oxygen as the expander cycle: „First, the hydrogen flows around the combustion chamber, cools it and vaporises. The gases produced are used to drive fuel pumps and are then injected into the combustion chamber with the oxygen and burned,“ says Head of Production Stefan Winter. „There is only one expander cycle engine with this level of performance in the whole world. While conventional cryogenic engines almost always need a gas generator to drive the turbo pumps, this process works differently in the Vinci combustion chamber. With the expander cycle engine, although the hydrogen is allowed through the cooling channels to cool the chamber, the clever design means that this remains in



COMPLETE MACHINING OF A CHAMBER

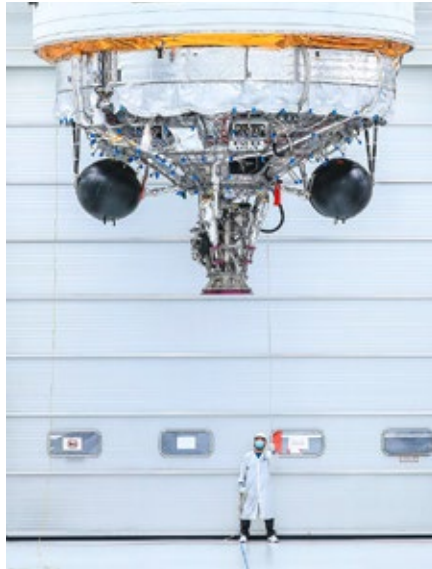
„The MILLTURN technology enables a variety of different processes to be combined. Tasks that were previously only possible with complex fixtures and complicated clamping can now be carried out with relative ease using the MILLTURN technology,“ says Head of Production Stefan Winter from the ArianeGroup Centre of Expertise in Ottobrunn.

With a thrust of
13.000
 kilonewtons the
 800-tonne rocket lifts
 off from the ground.



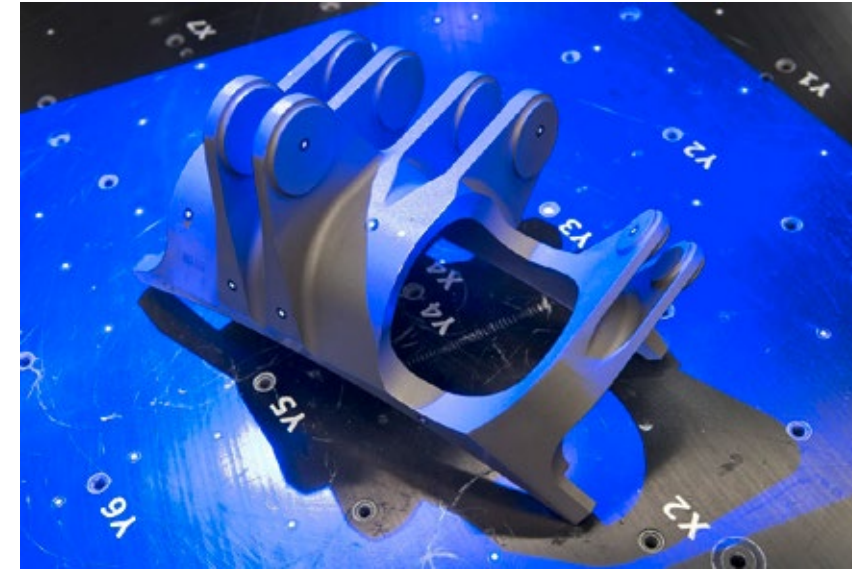
NEW GENERATION

The Vinci engine represents the latest generation of cryogenic upper stage engines for launchers. It is designed so that it can be manufactured industrially. It was developed by ArianeGroup in collaboration with its European partners as part of an ESA programme.



DRIVE SOURCE

Thrust chambers for the Ariane engines are manufactured in Ottobrunn. Here you can see the first two flight models of the main stage engine Vulcain 2.1 and the upper stage engine Vinci.



PRECISION

Components for space travel must fulfil high quality requirements. ArianeGroup therefore uses the latest methods to inspect them in Ottobrunn, such as laser measurement shown here.

the chamber for a long time, until it is as hot as possible. We then use the expanding gas to drive the turbo pumps. This is the big advantage of the Vinci engine."

M80 MILLTURN used to produce the Vinci engine

The majority of the engine parts from Ottobrunn are manufactured on a WFL M80 machine. This also includes the combustion chamber base body for the engine. First, the base body is prepared for turning of the inner contour, followed by the turning and milling of the outer contour. These two processes were previously carried out on two machines.

Thanks to the M80 MILLTURN, both processes – turning and milling – are combined and stable clamping is ensured. This is a huge advantage, especially for long, thin parts such as the Vinci combustion chamber. The zero point clamping system also provides maximum flexibility in production. „This is excellent," emphasises Winter.

A special alloy is used for the Vinci engine's base body. The patented copper-silver-zirconium alloy is characterised by high strength, an excellent heat transfer value and excellent machinability, which is particularly relevant for the Vinci chamber. Due to the aforementioned long, thin design, the material properties are very important. The material is first cast in blocks and then forged into the desired shape. Quality is ensured by means of ultrasound and then it is released for production.

The main production steps for a Vinci combustion chamber following delivery of the blank are turning, milling, electroplating, welding and finally finishing. Eighty percent of the workload is carried out with the M80.

Furthermore, cutting tests for the future are also carried out on the M80. The sturdy design and excellent kinematics provide more opportunities than thought. The first tests on the M80 MILLTURN have already been carried out with ceramic cutting materials. In the medium term, this process is also to be carried out on the WFL machine for Inconel and nickel. „I am very confident that we will be able to do this on the WFL machine," says Winter.

„When it comes to machining times, our investment in the WFL M80 MILLTURN / 3000 mm brought enormous added value"

Innovative spirit for technology and personnel

The MILLTURN is currently being used to manufacture other components besides the Vinci parts. The production team also uses the machine to produce satellite parts, as well as in R&D and for the construction of jigs. „This mix makes the best use of the machine's capacity," explains Stefan Winter. „I am also a fan of development work, as this is undoubtedly the workload of tomorrow and we have to continually face new challenges. For instance, we are currently working on components for the drive of the future – Prometheus for example."

The various versions of the Prometheus engine are to be driven by liquid hydrogen and liquid oxygen, as well as liquid oxygen and methane. These will be the first European engines with controlled combustion, enabling them to adapt to the launcher's flight conditions during the various phases of the mission. A digital system will provide control over a range from 30 to 100 percent maximum thrust. Prometheus will also be equipped with artificial intelligence and a health monitoring system that will enable diagnostics to be run on the engine's functioning.

The family of Prometheus demonstrators also benefits heavily from the latest 3D printing technology. Parts produced in this way account for 70 percent of the total weight of the engine.

„The WFL is very well suited for all of these exciting future projects," says Stefan Winter. It takes a motivated team of engineers and skilled workers to bring all this to life. In particular, highly complex machines such as the WFL require excellent, conscientious employees. When the finishing process for an item worth over half a million euros is taking place on the machine, it's a tense moment for the employees. „It is hard to find good employees, so we are always on the lookout for good skilled workers," states Winter.

„As Head of Production, it is particularly important to me to make the workplace interesting for employees. We mainly have senior engineers and technicians working in production at Ottobrunn. Good skilled workers are thirsty for knowledge and therefore need to be challenged and supported. Which is why we try to make the workstations as interesting as possible. For this reason, we are extending the programming with an additional programming system. Our medium-term goal is to have a pool of specialist personnel assigned to a machine and for this to also be independently implemented from programming to

production of the component. We will then deploy this job rotation on other machines. Over the next 5 years, I want to change production to this effect. To do so, we need dedicated, qualified personnel," says Winter with conviction.

He also adds: „We are working with extremely expensive materials in accordance with the highest industrial standards and to the highest levels of quality. When a rocket is launched, there are no second chances, so we cannot make any mistakes. Quality-driven personnel are essential here and we have them."

Why MILLTURN?

„When it comes to machining times, our investment in the WFL M80 Millturn / 3000mm brought enormous added value," explains Stefan Winter. The WFL replaced a 3-axis lathe and a 3-axis milling machine. A zero point clamping system was implemented on the M80 so that setting-up is still very quick. This reduced the lead times and wait times by at least 30%. „One of the biggest advantages of the WFL machine is its large tool magazine. Because of the Inconel machining, we always have between four and six sister tools in use, so we need sufficient tool stations. This is not a problem thanks to the magazine's modular concept. If we need even more tools, we can just buy another tool turret disc. It's fantastic! In the past, three processes would require three NC programmes or more. Now we only need to release and maintain one NC programme for the same work. It also makes configuration management much easier, as there is less data to manage. This was a big step forward," explains Winter enthusiastically.



When asked why they opted for a MILLTURN and the M80 model, Winter responds: „Ultimately, the machine kinematics and references won us over. A quick supply of spare parts, components from renowned manufacturers and also the proximity to the manufacturer were also important to us.“

The machine is equipped with a pick-up magazine and a WFL system boring bar. „We worked with WFL and Sandvik to procure a special 1.4 m-long boring bar so that in future we can also machine the Vinci’s inner contour on the WFL.“ Winter continues: „To turn the inner contour on the WFL, we also developed a new device, which is now complete.“

The machine also had to satisfy certain reliability and accuracy requirements. „The machine had to meet a tolerance of around 1/100 in the required working range. That is our requirement. Temperature influences play a huge role here, so our production hall is also air-conditioned. Therefore this is regularly checked and controlled by us and the machine is also temperature-monitored. WFL is really on the ball with the technology,“ says Winter.

Sealing surfaces are manufactured at ArianeGroup using the Utronix software cycle – the virtual U-axis. Circular surfaces are needed on certain workpieces, at every angle. „At around 135 degrees, we have to circular machine a sealing surface of 28 mm around a 20 mm hole with a boring bar. This then becomes increasingly larger. So the Utronix cycle is often in use here and is very important,“ says Winter in regard to the machining process.

Winter also emphasises how the new machine is an advantage when manufacturing a nozzle demonstrator: „We were asked to build a nozzle demonstrator. The challenge was to manufacture a complex conical inner contour with cooling channels. Thanks to the machine’s stability, we were able to carry out the broaching process with a length of almost 500 mm. The combination of stability, flexibility and the required working area in the machine allows this kind of special machining to be tackled and carried out.“

facts

- 7.000 employees in Germany and France
- 11 subsidiaries and majority holdings
- 50/50 joint venture between Airbus and Safran
- Revenue of 3.1 billion euros in 2021



KNOWHOW

The machine calls for the highest levels of expertise. Which is why ArianeGroup focuses on continuous personnel development and advanced training. Head of Production, Stefan Winter, believes it is particularly important to make the workplace interesting for employees, to attract motivated and specialist personnel.

All eyes on...

T series – slant bed turning machines

by WFL MILLTURN Technologies

Based on the proven MILLTURN complete machining centre, WFL offers a turning machine concept for the highest standards: the T and TB series. These slant bed turning machines, available in varying sizes between T40 and T150, enable high-precision machining of workpieces up to 1480 mm in diameter and 12000 mm long.



All eyes on

T series – slant bed turning machines

by WFL MILLTURN Technologies

The T40 to T150 series are slant bed turning machines with one or more tool turrets for difficult machining and the high-precision machining of shafts and chuck parts as well as ID turning with long boring bars. The TB series with individual tool holder is the optimum solution for complex turned parts and for turned parts which require a high tool stock level.

WFL turning machines in the TB series are equipped with Y- and B-axes, as well as an external large-capacity tool magazine and an automatic tool changer. The optional prismatic tool system enables automated use of especially long and heavy tools: The options for challenging machining are therefore massively increased.

Machining units on the top guide way



Tool turret



Individual tool holder with B-axis in rotary design



Boring bar slide

Components on the bottom guide way



Tool turret



Steady rest



Tailstock



Counter spindle

Fast and reliable: the tool change



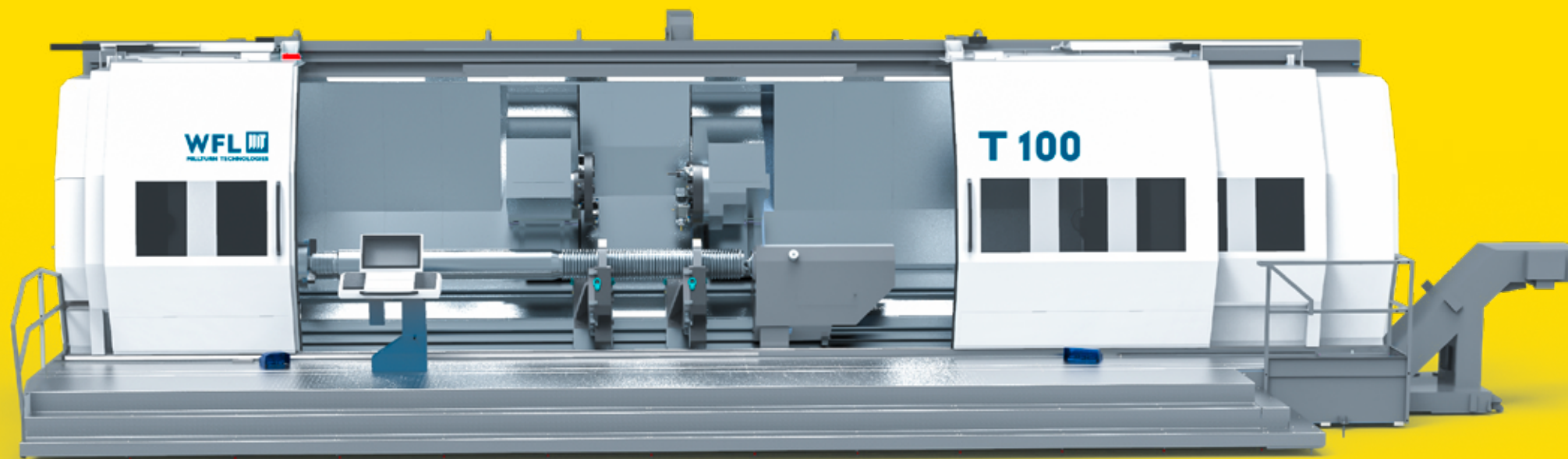
- Fully automatic tool change with double gripper for tools at the standard interface
- Highly dynamic change processes save huge amounts of time
- Reliable change of processes, even with heavy tool weights
- Tool change in any Z-axis position
- Change tools up to 900 mm long and weighing up to 35 kg (depending on the machine type)

Disc magazine for standard tools



- Maintenance-free standard disc magazine with up to 108* tool stations
- Can be equipped from the front side of the machine during machining
- Extremely user-friendly
- Convenient software functions support the foresighted and cross-task equipping of the magazine
- Some machine types have an optional chain magazine version with increased storage capacity

*Larger number available upon request (chain magazine)



More features of the T series

- Tool turret
- Pick-up magazine
- Prismatic tool magazine
- High-precision workpiece measurement
- Coolant units for deep hole drilling
- Boring bar slide for T and TB machines
- Ultra-High Pressure Coolant (UHPC)



FORESIGHT

The unique scenery of Innsbruck casts a spell on its inhabitants and visitors alike.

We love...

...Tyrol

From the Golden Roof, a landmark in the heart of Innsbruck's Old Town, to the Imperial Palace and the impressive Nordkette rising to 2,000 meters above sea level, you've not truly embraced the Innsbruck region until you've seen and experienced these sights and attractions.

When it comes to culture and nature, highs and lows, traditions and trends, no other region combines such opposites in such a charming manner as Innsbruck. In just 20 minutes, you can float from the heart of the Tyrolean capital to the lofty heights of the Nordkette, to experience this Alpine jewel up close and view the hustle and bustle from above. Or you can take a trip through time from modern architecture to historical buildings and discover Alpine-urban style. The special flair of the old town and its famous sights is just a breath away from the next hike or cycling tour, the next ski region or winter hiking experience.

The Nordkette

The highest city stroll in the Alps – the ride to the top of Innsbruck's 'own' mountain soars high above the River Inn, spruce

forests and jagged rocks to the home of the ibex. The futuristic-looking Hungerburg funicular, designed by architecture superstar Zaha Hadid, transports visitors from the centre of Innsbruck up to a plateau above the city. Guests then take the Seegrube cable car to Seegrube station and then the Nordkette cable car up to Hafelekar – the window to the Karwendel mountains.

On days when a thick blanket of cloud obscures the view to the Hafelekar, guests wait for that magical moment when the gondola breaks through the wall of cloud and soars into the blue sky. The Nordkette thrives on breathtaking contrasts – one reason why the region enjoys cult status, even among locals. Warm Indian summers, the first snow, Innsbruck's busy streets and the summit cross, the hustle and bustle of the city and the complete silence are all just a short cable car ride away from each other.



A FUTURISTIC
ride up to the high plateau. Exit of the Hungerburgbahn, designed by star architect Zaha Hadid.



RESPLENDENT
The Golden Roof has glistened for almost 400 years in the Stadtplatz, Innsbruck.

„On the Bergisel, steeped in history 200 years ago, courageous Tyroleans fought for the freedom of their country.“

The City Tower

The City Tower was completed in 1450 on the site of the old town hall. It might not seem huge compared to modern buildings, but in 1450, 51 metres was very impressive and a proud symbol of the self-confidence of the people of Innsbruck. Its onion dome was added a hundred years after its completion. It rises

The alcove balcony gets its name from the **2,657** fire-gilded copper tiles.

majestically skywards amongst the medieval buildings of the old town, providing an excellent vantage point for finding one's bearings and enjoying a romantic view of Innsbruck.

Guards kept watch from the city tower for almost 450 years, warning citizens about fire and other dangers. The lower storeys also served as a prison. Over 133 steps lead visitors up to the 31-metre-high viewing platform. This overlooks the medieval streets, and also provides a view of the Bergisel hill, Patscherkofel mountain, the River Inn and the Nordkette.

The Golden Roof

Innsbruck's most famous landmark is almost 50 years younger than the City Tower but it still shines today in the heart of the historic old town. The alcove balcony gets its name from the 2,657 fire-gilded copper tiles. The building has reigned over medieval houses and shady arcades for over 500 years. It was built by Emperor Maximilian, who enjoyed the view: he would gaze out at the smorgasbord of activity in his city, watch jousting tournaments and let people pay homage to him. The front depicts the Emperor and his two wives. As rumour has it, the Emperor liked his first wife better and so only Maria of Burgundy looks out from the relief, while his second wife, next to him on the image, keeps her gaze lowered.

Court Church

Moving on from the Golden Roof to the Court Church. The Court Church is called the „Schwarzmander Church“ („black men church“) by locals thanks to the 28 life-size bronze figures that stand guard, not just over the church but also the tomb of Emperor Maximilian I within. Interestingly, eight of the „black men“ are actually women and the Emperor's tomb is empty. Maximilian is actually buried in Wiener Neustadt. However, the church walls and foundations there were not strong enough to bear the weight of his carefully crafted tomb. He had meticulously planned its construction prior to his death, but it was not completed until three decades later.

The Silver Chapel is a must-see for all visitors to the Court Church. Two other famous people from Innsbruck are buried here: Archduke Ferdinand II and his wife Philippine Welser. During her lifetime, she was a local celebrity: the „Queen of Hearts“, a herbal expert, and a bathing beauty, who was even accused of witchcraft by detractors. A magnificent silver altar with Madonna by court architect

Giovanni Lucchese dominates the room alongside another special feature: an organ with pipes made exclusively of wood.

The Triumphal Arch

A Roman-inspired triumphal arch surrounded by modern city life and impressive, timeless mountains: The Triumphal Arch is one of Innsbruck's most striking sights. Like a triumphal arch of antiquity, it bears witness to Innsbruck's history. And yet it is not that old. The baroque structure was built by order of Maria Theresia in the 18th century.

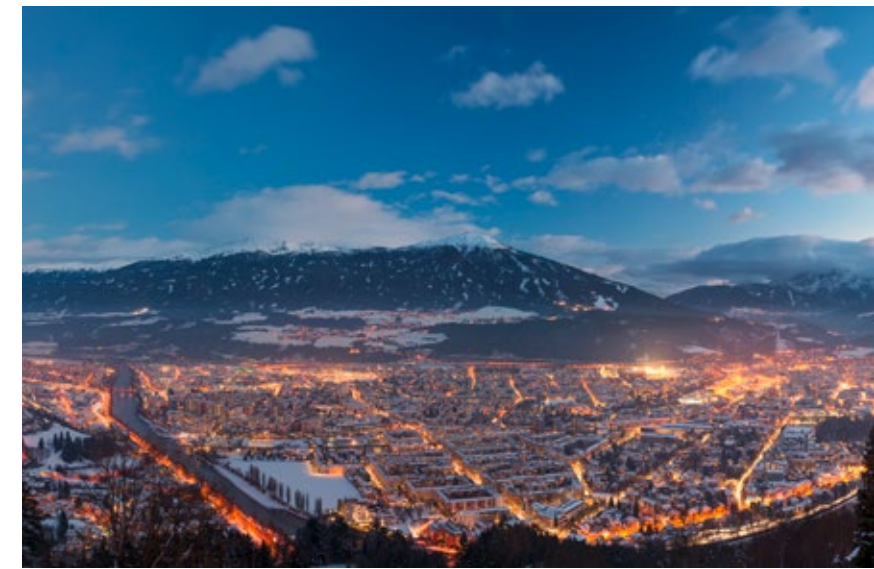
At that time, the Empress was planning the wedding of her son Archduke Leopold in Innsbruck. Numerous changes to the cityscape can be traced back to this imperial „wedding planner“. For example, the medieval city gate at the entrance to Innsbruck's old town was demolished, with the stone being used to build the Triumphal Arch. However, it was richly decorated with skilful marble reliefs and inscriptions. It stands at the end of Maria-Theresien-Strasse and marks the edge of the city centre.

Bergisel ski jump

The ski jump sits majestically above the Olympic city of Innsbruck on the historic Bergisel hill, which has always been of great importance for Tyrol and especially for Innsbruck. Around 200 years ago, brave Tyroleans, led by Andreas Hofer, fought on this hill for their country's freedom. The first ski jump was built on this historic ground in 1925.

The sports site has hosted the Olympic games twice: the Olympic flame burned on the Bergisel at the Olympic games in 1964 and 1976. Other spectacular, major events have taken place at the stadium, such as the mass celebrated by Pope John Paul II in 1988 for 60,000 believers.

Historical treasures and modern architecture, untamed nature and urban hustle and bustle. Sightseeing in Innsbruck is all about contrasts, especially between the city and mountains. Innsbruck animates, endows and inspires the soul of every single one of its visitors.



AFTER THE OTHER
133 steps lead visitors to the top of the City Tower.



FEAST FOR THE EYES
Artwork and Olympic history in a single location – the Bergisel ski jump.

FACTS
Population: 754.705
Size: 12.640 km²
Capital: Innsbruck
Districts: 279



EDITOR'S TIPS

- [Ambras Castle Innsbruck](#)
Schlossstraße 20, 6020 Innsbruck
- [Swarovski Crystal Worlds](#)
Kristallweltenstraße 1, 6112 Wattens
- [Helbling House](#)
Herzog-Friedrich-Straße 10, 6020 Innsbruck
- [Nordkette Cable Car](#)
Rennweg 3, 6020 Innsbruck
- [Alpenzoo Innsbruck](#)
Weiherburggasse 27, 6020 Innsbruck



All eyes on

Titanium machining – Special materials for complete machining

by WFL MILLTURN Technologies

Complete machining places particular requirements on the machine and working processes. If this involves a material such as titanium, which is particularly hard to cut, specific know-how is necessary to deal with these requirements. Thanks to its expertise, WFL Millturn Technologies GmbH & Co. KG impresses in this field with a machining solution for aircraft landing gear.

The aviation industry represents an important market segment for WFL. This industrial sector increasingly requires ever more materials that are deemed to be difficult to machine. Titanium machining in particular is a field in which WFL shines with its wealth of expertise.

Material with particular properties

Titanium has always placed particular demands on tools and machines during the cutting process. In recent years titanium 3.7165 has become prevalent among lightweight materials as a material with outstanding properties, especially in the aviation and space industries and also in the medical sector. It is one of the most frequently used titanium alloys, containing 6% aluminium and 4% vanadium. This alloy, normally referred to as Ti-6Al4V, exhibits a very good combinati-

on of strength, corrosion resistance and capacity to withstand stresses. Although this material does have good empirical values and cutting data, processing it still remains one of the supreme disciplines in machining.

The titan of all metals

New titanium alloys are constantly being developed for special applications and these are often on the basis of specific customer requirements. A number of WFL customers require Titanium 5553 (Ti5Al5V5Mo3Cr) for the production of landing gear in the aviation industry. This material stands out due to improved properties with regard to strength and toughness. It is also less sensitive to structural changes during heating. This material is indeed one of the real Titans in the field of machining and takes its name from Greek mythology.

Ti 5553 is at present one of the hardest materials on the market to machine. During machining, a cutting speed of 45 m/min should not be exceeded, as the tool life decreases dramatically at higher cutting speeds.

Challenges in titanium machining

Problems like point heat due to poor heat conduction and associated chemical

changes in the material (embrittlement at higher temperatures) and the formation of built up edges occur to a greater extent with this material than with other titanium alloys. Therefore it is particularly important that cutting speed, feed rate and cutting depth are matched to one another accurately when working with Ti 5553. The use of suitable cooling lubricants is just as important as the correct cooling strategy. A quick and continuous removal of swarf must be guaranteed. Removal of the forging skin, referred to as „elephant skin“ by experts, is an additional challenge with this material. The upstream forging process and the resultant thermal and metallurgical influences give this skin a very high level of surface hardness.

The low modulus of elasticity means that titanium tends to evade the pressure of the tool and to fuse with the cutting edge. The machining should therefore, as already mentioned, occur at a low cutting speed but with a relatively high cutting depth and adapted feed rate. Vibration free, clamped, sharp tools and a securely clamped workpiece must be ensured in any case.

Experience is the decisive factor

It is essential that the ability to cater for critical aspects of machining during ma-

nufacture is demonstrated as early as the design phase. For example it is necessary to take into consideration the fact that different material thicknesses in the blank workpiece require modified machining strategies. Heat affected zones must also be taken into consideration together with the cutting forces which occur.

Materials which are hard to cut like titanium have influenced the development of the WFL machines. WFL provides individual solutions for exactly these kind of demanding applications. These also cover aspects such as cooling and production strategy as well as the actual machine.



Thanks to WFL's own spindle development, the cooling lubricant can be directly fed to the cutting edge through the milling spindle at a pressure measuring up to 200 bar. This ensures rapid, continuous removal of swarf.



As well as the Millturn complete machining centres, WFL provides the necessary software solutions in the form of tailored machining strategies, process design and programming.



Titanium 5553 (Ti5Al5V5Mo3Cr) is required for the production of landing gear in the aviation industry. This material stands out due to improved properties with regard to strength, toughness and increased heat resistance. However „Titanium triple-five-three“ as insiders call it, is currently one of the most difficult-to-process materials.

„In order to be able to offer WFL customers reliable solutions, WFL has developed modules which make it possible for us to match the design of the machine precisely to the relevant application case.“

Reinhard Koll, Head of Application Engineering WFL

Mikrosan – has the right twist

Mikrosan is a plastic extrusion line manufacturer, with its headquarters near Istanbul.

The company was formed in 1978 which means 43 years of expertise in the sector of manufacturing extrusion machines. The company was founded by Naci Sönmez, everything started with a small group of people, today the company has more than 140 employees. Mikrosan operates two factories, the screw manufacturing is located in the main factory. All extrusion lines are manufactured and assembled in house. In the headquarters they also do assembly and the testing of the machines. The other factory is about 60 km away from the headquarters and in this factory the assembly of the machine frames as well as the painting of the components is being done. The company totally has about 20.000 m² production area in two factories. Another advantage of the company is that the nitriding (heat treatment) process is based in the factory, everything is done inhouse. This is a specific advantage that Mikrosan is offering compared to the competition. Mikrosan's products range from pipe extrusion lines, profile extrusion lines to granulation lines. The company is producing especially for the plastics industry and the PVC market. Important products manufactured on extru-

sion machines are for example window profiles. Further products are PVC pipes, clean water pipes, pressure pipes and granules. Mikrosan has already supplied more than 5000 extrusion lines all around the world so far, in more than 65 countries. The main markets are Turkey, Europe, USA and various Arabian Countries. The export rate is 60-70%, depending on the market conditions.

All from a single source

"Having the complete manufacturing process chain directly at Mikrosan is very important for us", Abdullah Demirci, Technical Manager, is explaining. The core competence is the manufacturing of all the screws and barrels in house, as customer requirements can be better fulfilled. Mikrosan is using a universal software "Unigraphics" to program screws and barrels. "To make a good extruder you need to make a good screw. You need a good software, you need a good machine, you need good stuff. The universal software has the advantage that you are not limited with screw programming, you can use different machining strategies, depending on your machine and on your

products", is Demirci expounding. Actually, Mikrosan is using a M40-G MILL-TURN with 4500 mm center distance and a swing of 520 mm for screw manufacturing. Important for Mikrosan's decision for the WFL was the superior output and torque values of the spindle drives. "The advantage of the WFL machine is

„Being the number one in the plastics industry with the manufacturing of screws and barrels is our major objective.“

the chuck and the tailstock function of the counter spindle. The size is perfect for us, because of the long center distance and the strength of the machine. It can easily handle different screws and barrels. The power of the turning spindle with up to 54 kW and the milling spindle with 33 kW was also an important point



SCREWS AND BARRELS

for extrusion lines are the main products that are manufactured at Mikrosan. The WFL is mainly used for the manufacturing of those screws and barrels. The longest screw ever done on a WFL had a length of 4000 mm.

for us. WFL was from the very beginning the right partner. As far as communication is concerned, we had just one face, one contact person that we gave all the feedback within the project execution. So, the process was very easy for us”, Abdullah Demirci is describing.

The WFL is used for high precision machining operations but as well for pre machining for screws and barrels. Middle sized to big sized screws are done on the WFL. The range size of screws machined on the WFL starts from just 90 mm diameter. With the WFL machine Mikrosan achieves the manufacturing of a screw in only one clamping. The longest part ever produced on the machine was approximately 4000 mm. The usage of nitriding steels, with a DIN Norm of 1.8519/1.8550, is the industry standard of the market. Screws are normally made of 1.8519/1.8550 and barrels are made of 1.8550. After machining the workpieces they need a heat treatment to harden the surface. In another step nitriding needs to be done, otherwise the parts would have a very short lifetime. “We have more than 250 extrusion line production capacity per year, one extrusion line includes at least 5 machines. That means we are producing more than 1000 machines per year”, stated Demirci.

Versatility counts

“Now we are still learning and developing with the WFL. We are always adapting cutting strategies or are creating new ones. Fact is that a lot of different screw and barrel geometries are being produced on the WFL machine. It is not a serial production, it always changes. Our software and the machine is capable for various designs. We are open for developing anything and the machine is capable for doing complex geometries of screws and barrels. So we can cover a wide range of parts. The 5-axis simultaneous machining cycle in the machine is a big advantage, this technology is especially used for manufacturing twin screws. When the geometry changes then you are getting a smooth transition with this cycle. This offers us continuous machining”, summarizes Demirci.

Top requirements

Priority when choosing the new machine was the size of the machine. Furthermore, the structure of the machine was a big point why the machine has been bought. 5-axis simultaneous machining was one of the major requirements. The steady rest and the ability to clamp the part only

one time was also an important advantage. WFL provided the postprocessor for the simple usage of the programs. That was a very critical issue. To run the machine as a turning machine as well as a milling machine the tailstock function of the counter spindle was very important. For screw machining special steady rests are required because the parts are very slender. The length/diameter ratio is up to 40/1, so a special machine structure is needed, otherwise there would be a risk of vibrations and the required good surface quality could not be achieved. For a good surface quality, it is also necessary that the clamping and workpiece support is very stable and steady rests must be capable to move during machining operations. While moving the milling head, the steady rests are moving simultaneously, everything is synchronized with the milling head. This is a great advantage. “After starting to work together our production times for screws and barrels have been reduced significantly. Furthermore, the delivery times decreased accordingly. However, we still see a potential of a further productivity increase, stated Demirci.

The tool measuring in the machine is a big advantage. The machine compensa-

tes the correct dimension by measuring the tool length by laser. Another advantage is the simulation software, CrashGuard Studio. Before machining we are using CrashGuard Studio to simulate the program. Possible collisions can already be detected in the programming phase. Operators are able to use the software on the machine and can therefore adapt the programs. WFL cycles are useful for easy machining. Furthermore the CrashGuard anti-collision software protects the machines during machining and stops the machine even in case of operating errors. Additionally, Mikrosan is using the WFL software iControl Advanced to optimize and monitor the machining process.

Future steps

Mikrosan will continue to focus on their core competence. Being the number one in the plastics industry with the manufacturing of screws and barrels is the major objective. In the future some new investments will be done. The strategic location of Mikrosan as well as the fact that everything is done inhouse is providing a huge flexibility. Due to the special requirements of the customers all the machines are tailor-made. This is a big advantage of Mikrosan.

Mikrosan’s machines are already prepared and ready for Industrie 4.0. The customers are starting to use the advantages of predictive maintenance. When companies have several extrusion lines in the factory they are always best informed about what is happening. “Planned stops are always better than an unplanned stop. Companies can act more consequently and are able to make provisions for the future. Our customers are very demanding, and we react quickly. Industry 4.0 is a very important tool for us”, is Demirci closing.



COMPLEX WORKPIECES

Complex geometries and difficult materials are the typical challenges for the machining of components for plastic machinery. Very tight tolerances in the range of a few microns can be reached using an integrated measuring probe and special measuring software. A huge advantage when manufacturing a screw.



HIGHLY EFFICIENT

When producing screws and barrels on the M40-G, the operator is using the WFL process monitoring tool iControl. The machining process can thus be optimized and monitored.



The production of extruders and the manufacturing of screws and barrels is Mikrosan’s profession. Mikrosan has 250 extrusion line production capacity a year, one extrusion line includes at least 5 machines. That means more than 1000 machines are produced in a year.



From left to right: Abdullah Demirci, Technical Manager at Mikrosan and responsible for the project management in house, Berkay Sönmez, General Manager at Mikrosan, Hakan Koc, Senior Regional Sales Manager WFL.



All eyes on

A green machine

WFL takes its responsibility for the sustainability of the company and its activities very seriously and has done so for many years. Since customers are increasingly factoring sustainability into their purchasing decisions, WFL continues to pursue this path.

The ever increasing environmental damage and its negative effects are a call to action. Our fossil fuel reserves will start to run out sooner or later, which will go hand in hand with rising energy prices. This has prompted companies to fundamentally rethink their approach to business. Sustainability in industrial production has therefore become a decisive matter when it comes to the future. Specific projects for reducing or preventing CO2 emissions have already been developed. Clear aims and measures help WFL to continually improve its sustainability and energy efficiency.

Greenside Technologies

Greenside Technologies enables machines to be put into energy-saving mode (the hydraulics, pneumatics, lighting, drive supply, cooling system, etc. are deactivated) during the production process (after completion of the workpiece in the commissioning) when they are not in use.

Savings in machine technology

Only energy-efficient components with the option of energy recuperation or use of waste heat are used in the MILLTURN turning-boring-milling centres. Frequency-controlled pumps are used alongside highly energy-efficient motors and drives, meaning that electricity is drawn only in the exact amounts required. When the spindle drives brake, the machine works as a generator and feeds valuable electrical energy back into the grid. The additional energy-saving standby mode for organisational downtimes requires around 65% less energy compared to conventional idling.

The number of WFL energy-saving features is clear to see:

- WFL energy-saving standby mode
- Frequency-controlled high-pressure pumps
- Cooling units through water-to-water heat exchangers
- CrashGuard Studio – preliminary simulation without machine operation
- WFL Adaptive Control – fewer non-productive machine movements
- Process monitoring – more efficient machining processes and less damage
- Machine room lighting with LEDs in place of halogen and fluorescent lamps

Efficient operation for a lifetime



Stable & valuable

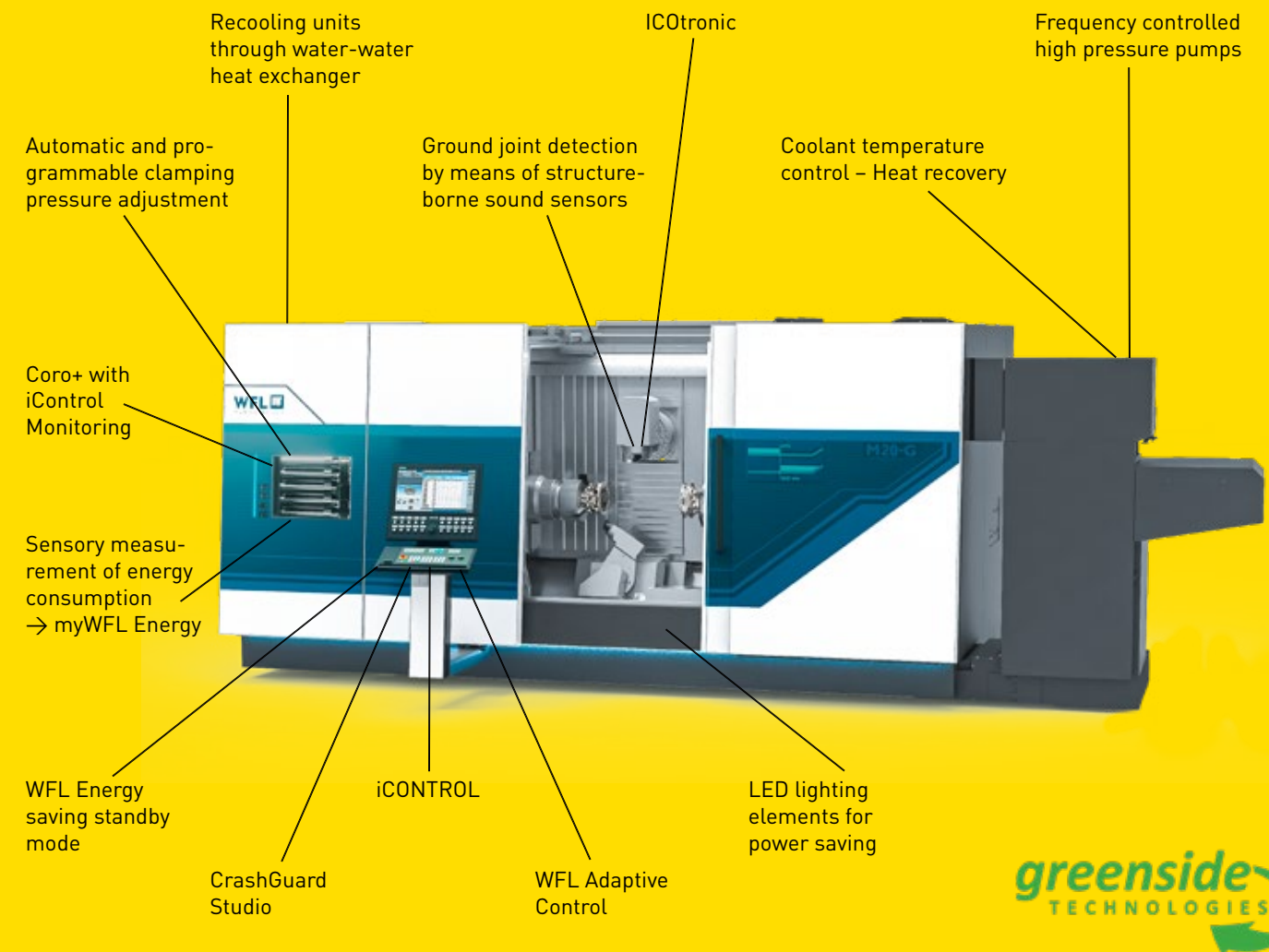


Resource-optimized design



CO2 Footprint

Savings in the area of the basic machine



Example energy-saving calculation

WFL after-work mode / energy-saving mode:
M40 MILLTURN / 2000mm

Calculated for an example company:

- 52 weeks of production per year
- 5 days of production per week
- 2 shifts per day
- Reduction in consumption due to energy-saving mode on average around ~6 kW

Savings:

$$6 \text{ kW} \times (8 \text{ h} \times 5 + 24 \text{ h} \times 2) \times 52 = -27.456 \text{ kWh} / -13,9\text{t CO}_2$$



Thanks to energy-saving mode, an example company can save up to **5,940 kWh** or **13.9t CO2**.

Mobile Robot Automation

An interview with Sales Manager **Andreas Bitzyk**, FRAI Robotic Technologies and Managing Director **Manfred Fahrion**, Autania Engineering.



OUTLOOK ON THE FUTURE

Customers are increasingly looking for holistic solutions. The mobileCELL makes companies more competitive.

Andreas Bitzyk
Automation Expert
at FRAI Robotic Technologies.



Automation tasks are becoming ever more challenging. Using intelligent software in combination with the relevant automation solutions not only enables workpieces to be loaded and unloaded but also means that machine tools can be set up fully automatically through automatic replacement of tools and clamping devices. FRAI strives to be an innovative automation partner and is therefore developing highly flexible robot systems to respond to this trend. Concepts such as the mobileCELL are a complete first and enable a wide range of expansion stages, making them as future-proof and competitive as possible.

Which technical innovations are there currently in regard to automation of work processes for a machine tool?

Manfred Fahrion: A general distinction must be made in regard to the industry in which the machine tools are being used and whether we are talking about pure series production or smaller batch sizes. Several industries are experiencing a paradigm shift, leaving many manufacturers unsure whether the latest product will still be on trend in the coming year or stuck on the shelves.

Autonomous production is also being increasingly sought after. Machines are equipped with larger tool magazines and automation must be able to keep up with this. So we have the following requirements for automation: it must ensure autonomous production 24/7, be flexible to use (product change) and compatible with Industry 4.0.

In addition to the classic changeover of parts, automation also takes on the other tasks such as tool change, parts transport, logistics, host computer functions, part tracking and product history.

Andreas Bitzyk: If you want to retain flexibility and yet achieve a high degree of capacity utilisation for individual machines, then this places more demands on the automation. The more complex the task, the more elements you need from the „knowhow kit“. The „knowhow kit“ is what I call the solutions that have already been successfully implemented in practice and work under real production conditions. FRAI has already developed a large number of kit elements: parts and position recognition, bin picking, reading and inscribing a DMC code, parts contour monitoring, automatic gripper exchange, jaw changes, etc. Depending on the task in question, we also have a network of partner companies which cover other aspects such as host computer solutions.

What is the current state of play in regard to automation in the industry and which developments do you foresee in the next two years?

Andreas Bitzyk: Overall networking, in particular information data acquisition, will become even more important in the coming years. We need to be able to acquire, process, evaluate and/or pass data on. This allows us to optimise production, the sequence and subsequently the capacity utilisation, and also meet customer requirements, which call for 100% traceability and parts history. Improving the capacity utilisation lowers unit costs, while higher quality lowers the cost of poor quality. These are well-known requirements, however they are becoming increasingly important. So in future, automation will be about using corresponding hardware to ensure a flexible material flow, handle components and also implement a variety of set-up processes.

Manfred Fahrion: There are several mega and macro trends which will shape

not only automation, but also virtually all industrial sectors in the coming years. Firstly, we have individualisation: there will be smaller series and more frequent product changes/innovations. Secondly, we have connectivity: everything is networked, each component has a QR code and can be tracked through to recycling. If you think about a smartphone, making a phone call is no longer the key function. The same is true of automation, in the sense that transporting a workpiece from A to B is not necessarily the main task in every application. Instead, the focus has shifted towards recognition, tracking and multitasking. Camera recognition and gripper exchange systems combined with host computer solutions have become the core components of a flexible solution that is compatible with Industry 4.0. Globally, I believe the trend will move towards a small cell solution with high intelligence and a high proportion of IT.

What challenges need to be overcome?

Manfred Fahrion: When it comes to modern automation concepts, holistic customer support starts with the technical sales team. Here, experienced technicians must work hand in hand with visionaries, 3D designers and software specialists to create the most useful overall concept for the customer. These resources must be provided at both the quotation stage and also later on for order processing. This is a very challenging task for management. You have to train young people yourself and ensure a good mix in all

departments so you are well prepared for the new tasks; develop high-tech expertise in your own company and continually adapt as development in these areas progresses at an incredible pace.

How does the new mobileCELL/the Mobile Robot Automation work?

Manfred Fahrion: Our mobileCELL is a hybrid solution, which impresses with its combination of wide-ranging functions and advantages. There was a time when the classic robot cell could only load and unload workpieces. This basic function was then enhanced with gripper exchange systems.

The disadvantages of the robot cell we are all familiar with are that the workpiece buffer is right in front of the machine and takes up valuable space on the production line and that the tools are tied to the machine locally, meaning they can

only be used on this one machine. The robot is positioned directly in front of the machine, significantly limiting manual loading and access for measurement, etc. It can only be used on this machine, is location-bound; unless it is placed on a linear axis. However, this is often difficult, as the machines are not exactly in a line or next to one another. Then there is the matter of internal transport from machine A to B or to and from the warehouse.

Due to the significant disadvantages of a location-bound robot cell and the costs for intralogistics tasks, a solution was discussed which would produce advantages for the customer from the aforementioned disadvantages. This is how the concept of the mobile robot matured and was converted into a prototype.

A generously-sized automated guided vehicle (AGV) with a robot cell design with

everything that you need. In other words, the robot, workpiece and tool gripper, along with buffer positions for workpieces and tools, and the necessary control & safety technology. As already mentioned, the machine is freely accessible. It is not blocked or obstructed. The AGV collects the required tools and workpieces in the warehouse, it then travels to the front of the machine, locks itself in place on the floor and exchanges parts and/or tools. The vehicle then moves away again and receives the travel instructions for the next machine. The space in front of the machine it has just loaded becomes clear again.

What preconditions must be met?

Andreas Bitzyk: For a mobileCELL to be useful, there has to be a long enough cycle time or there must be other advantages such as flexible, internal transport with the use of several mobile robots.

Manfred Fahrion: The travel paths must be suitably wide (3 m), but that is usually the case for normal forklift operation. The wheels are designed to travel over expansion joints and slots, such as we might have with fire doors or similar, without any problems. A virtual server and a WLAN network must be available, but that is also industry standard these days.

What are the advantages of automation with the mobileCELL?

Manfred Fahrion: The advantages offered the mobileCELL can be summarised as follows:

- Space saving in front of each machine that is being served
- Optimum access to the machine for operators and service personnel
- One robot can be used for several machines
- Interlinked machines and processes do not have to be in a line or next to one another
- The storage area is in the low cost warehouse space, not in the expensive production hall
- Tools can be used universally on several machines, they are not locally tied to individual machines
- Intralogistics costs are reduced, as the AGV takes the parts to the next process or to the warehouse
- Compatibility with machines that could not otherwise be automated or for which a separate robot cell would not be possible



„Our mobileCELL is a hybrid solution, which impresses with its combination of wide-ranging functions and advantages.“



Manfred Fahrion
Managing Director of
Autania Engineering

THE DISCIPLINE OF SUCCESS

Fast like a Lamborghini, strong like hydraulic grippers, smart like a high-end PC or durable like a gear unit. This is exactly what many people aim for in a converted and adapted form. Not far from this perfection is Carolina Sandhofer. A young athlete on her way to the top of the triathlon sports world.



We dare to say that WFL is sporty. We are sporty in terms of fulfilling company goals, achieving precision in the processing of complex workpieces or developing new innovations in our machines. The health of our employees is particularly important to us. We want their well-being at work to be constantly improved and maintained in the long term. For this reason, we decided to give a sponsorship to Carolina Sandhofer this year. As a triathlete, she deals with health, exercise and nutrition on a daily basis and is used to delivering top performance. This is why we can learn a lot from the values and attitude of a top athlete. At WFL we regard the motivation that drives athletes to reach their limits as inspiration. On the one hand as a sporting inspiration for our employees, but on the other hand as a mental inspiration for all situations in life.

Of course, a person will never reach the speed of a Lamborghini on their own, but still demand maximum performance for themselves. In truth, the human being is an infinitely complex construct with many facets, which definitely shows some parallels to today's machine world.

A MILLTURN from WFL stands for maximum precision, enduring performance, power, stability and, above all, reliability. However, these attributes are not only essential for the machine tool industry, but also very important for athletes. A person's strength and endurance must be carefully trained. High performance results from commitment and the will to achieve unique performance. A direct comparison between man and machine is thus closer than you might think. The triathlon area in particular combines a wide variety of skills into an effective overall package.

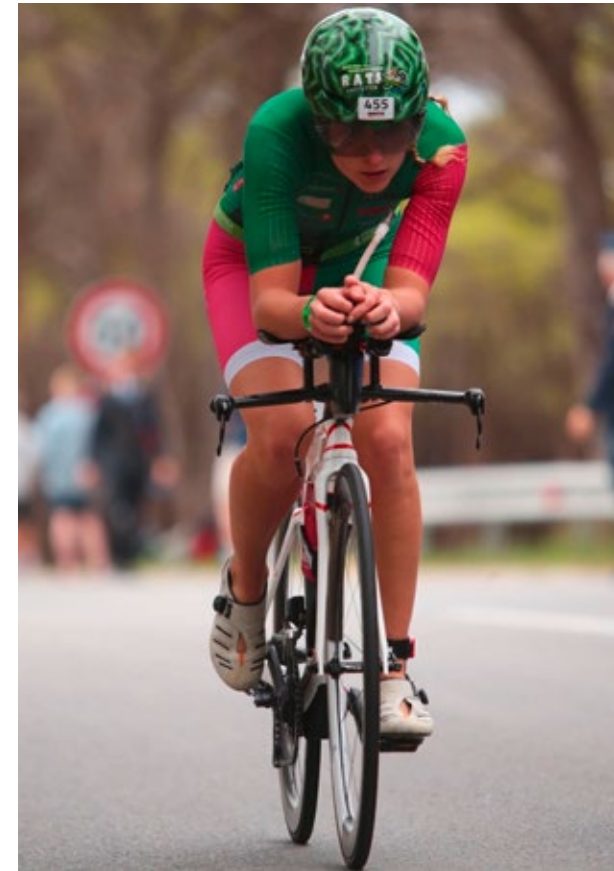
Carolina Sandhofer, a young athlete on her way to the top of the triathlon sport world, is not far from this perfection. After graduating from the BRG Waidhofen/Ybbs in 2015, the athlete began her bachelor's degree in teaching for primary school, which she successfully completed in 2019 and also passed the state examination to become a triathlon instructor. With a lot of knowledge under her belt, Carolina Sandhofer got off to a flying start and laid the foundation for her current success at a young age. WFL accompanies „Caro“ part of the way and

supports the athlete in approaching her goals. At the top of Caro's bucket list is a life as a professional and above all the Mecca of triathlon – the „Ironman Hawaii“. But first, she will compete in the Triathlon World Championships in St. George/Utah/USA in October.

Carolina Sandhofer now gives us a glimpse behind the scenes and, above all, tips on how to do sports professionally.

How did you get into triathlon in the first place?

I was a very active child, and I was able to try out many sports at a very early age. At the age of 12, I got stuck in road cycling and was allowed to compete in many



„My biggest motivation is to get better and faster at what I love to do.“

races and even for the Austrian national team. I first came in contact with triathlon at the age of 16. After a great success at the Age Group EM in Kitzbühel in 2014, I decided to continue with triathlon.

What motivates you, what drives you to achieve your goals?

My biggest motivation is to get better and faster at what I love to do. In addition, I keep getting to know myself and my limits anew and see how I can push them.

How much time do you invest to achieve your goals?

I train between 15 and 20 hours a week. However, the time that I invest in my goals

is significantly higher since you also have to consider the preparation and follow-up work. Basically, you can say that Triathlon is like a second job for me.

What does an efficient training look like?

For me, a training is the most efficient and beneficial when I'm fully focused and with my head and mind on the job. That is when I can train best.

How does a triathlete become successful?

Triathlon is an insanely tough sport not only in physical, but also in mental terms. Successful triathletes can go beyond their limits and have a strong mind. At a certain point in the competition, it is all a matter of mind over body, because the latter is already very tired and would like to stop. Those who then manage to keep a clear head will be successful in the end.

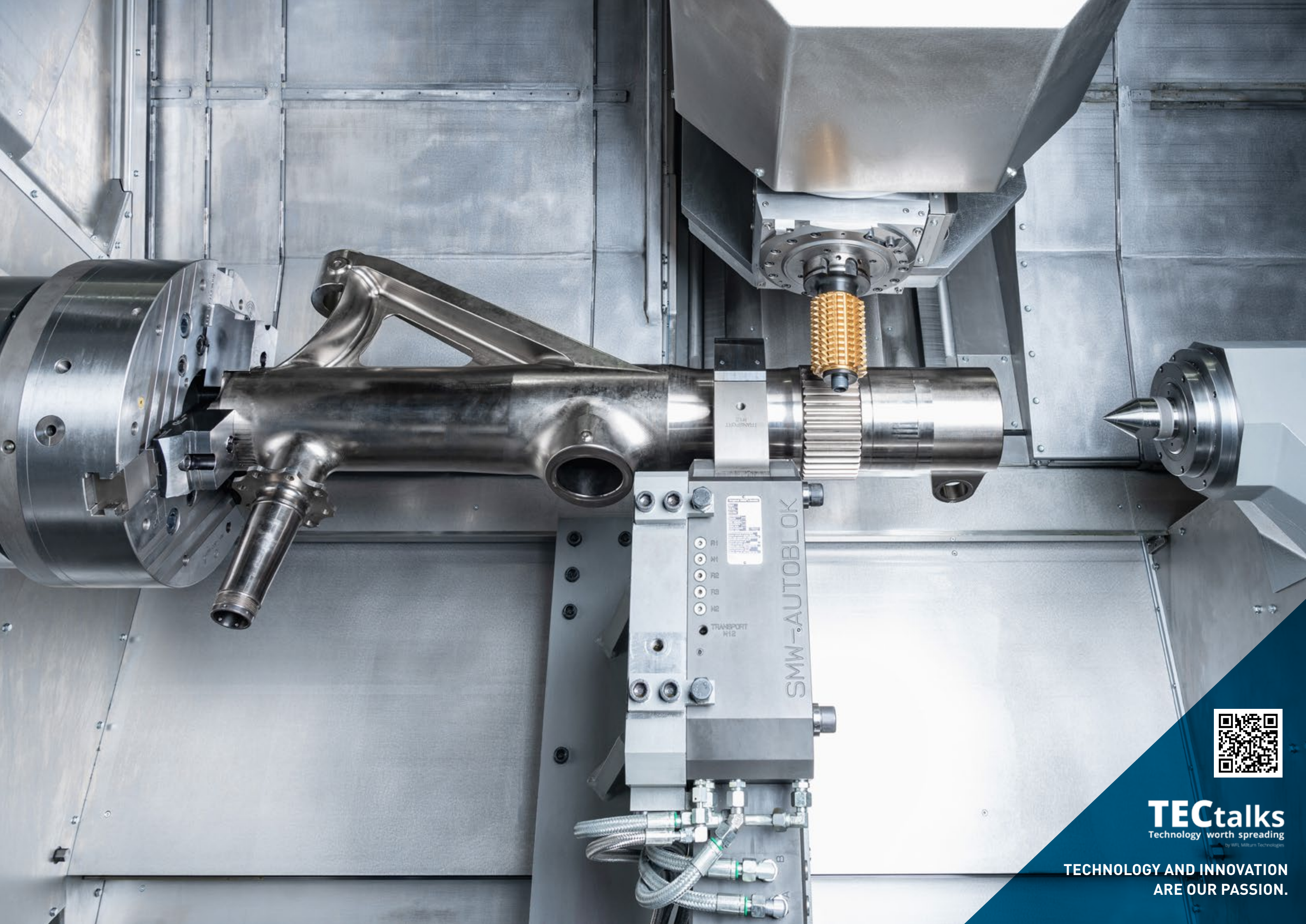
Do you see any parallels in achieving goals in companies, creating successful products, etc. with sport?

Achieving goals requires a lot of perseverance, ambition and determination, no matter if in sports or in a company. If you don't lose sight of your goal and work on it in a focused manner, you will achieve it. Detours are always part of it and make life interesting and worth living.

The 25-year-old triathlete Carolina Sandhofer accompanies WFL in 2022 as a testimonial. She supports WFL in terms of sports and motivation, for example with training sessions for the City Night Run in Linz, online training on the topic of trunk stabilization and lectures on the topic of nutrition and sports.

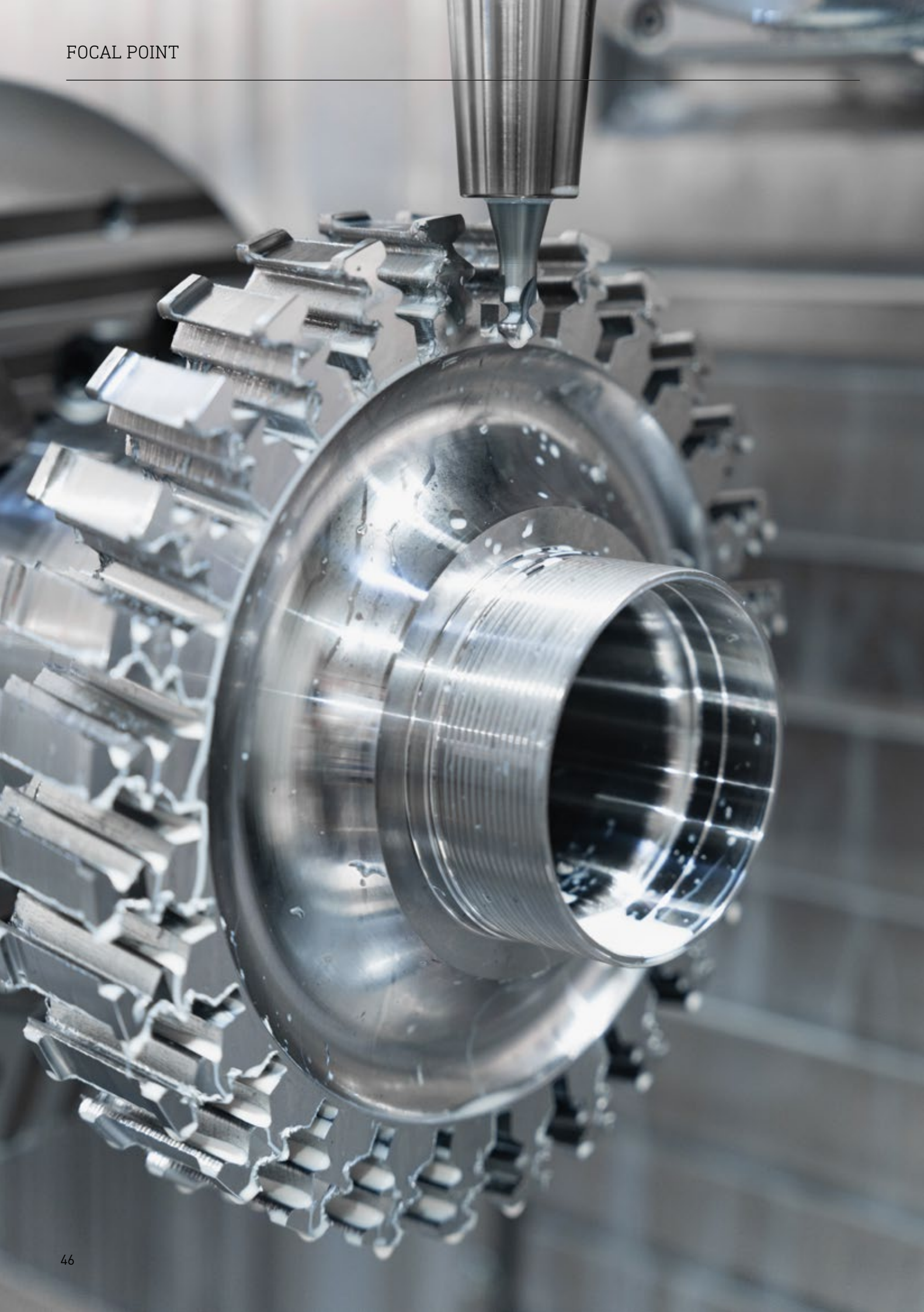
Sporting achievements in 2021

- Win Ironman 70.3 Sardinia AK 24-29 with a 10-min. lead (5th lady overall)
- Austrian Champion AK 24-29 middle distance (5th lady overall ÖSTM)
- State champion overall middle distance
- Qualification Ironman 70.3 World Championship 2022



TECtalks
Technology worth spreading
by WFL, Millium Technologies

**TECHNOLOGY AND INNOVATION
ARE OUR PASSION.**



C02 Footprint Demo part

Technology:

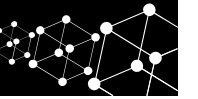
- Complete machining in 2 clampings
- Fir tree cutter
- Gear hobbing of OD gear
- Gear hobbing ID gear
- Measuring of finished part

Highlights:

- Determination of the energy consumption during the machining of the workpiece
- Comparison of different processes
Turning milling vs. turning in interrupted cut
- Comparison of different cutting materials
Carbide vs. ceramic vs. CBN
- Comparison of different machine configurations
Single tool carrier above vs. turret vs. single tool carrier below

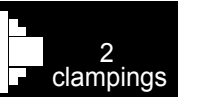
M20-G

42CrMo4

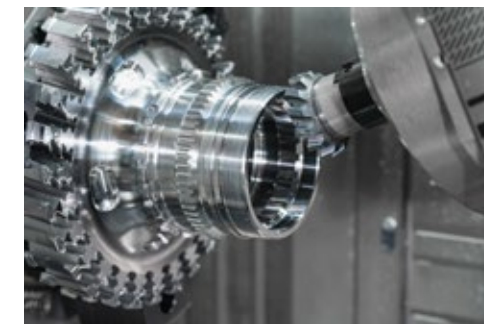


L: 250 mm
10 in

Ø: 216 mm
8,5 in



7,2 h



»» 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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