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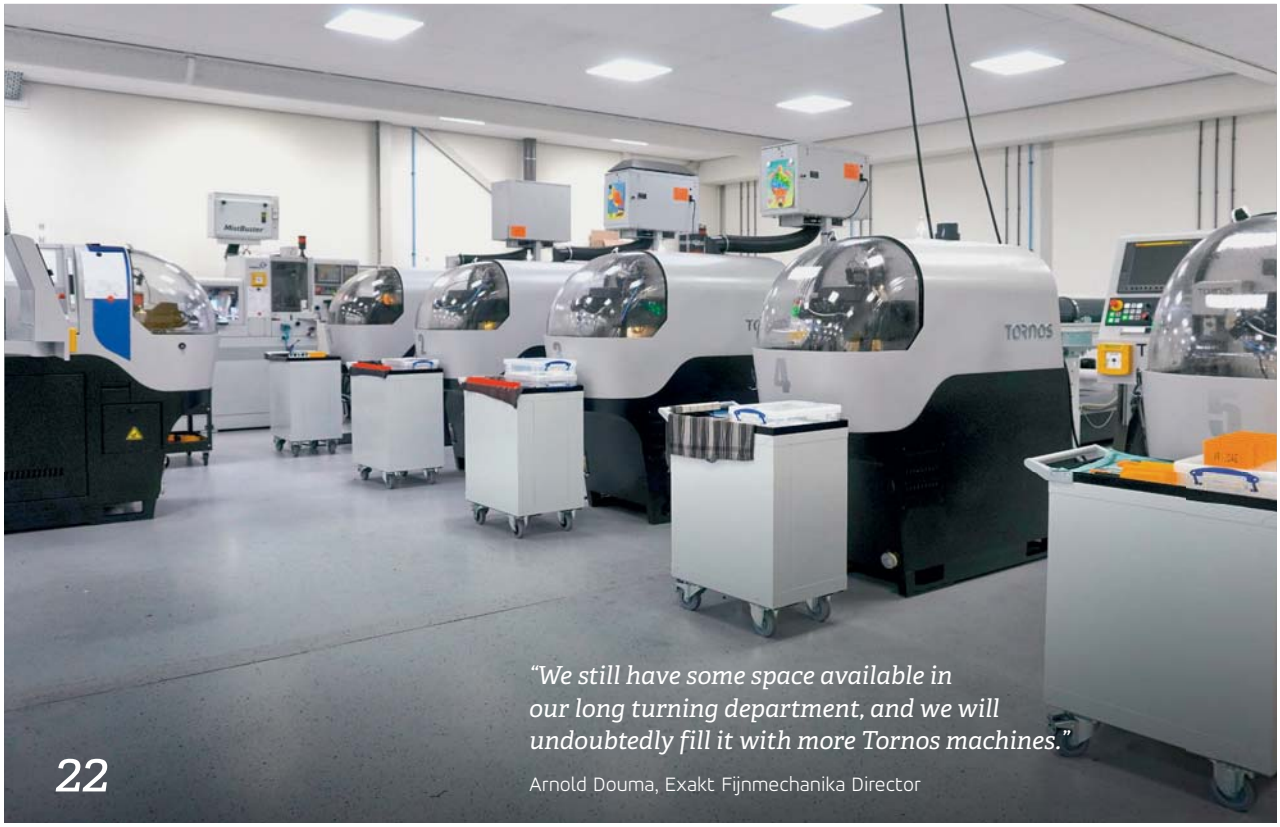

"We still have some space available in our long turning department, and we will undoubtedly fill it with more Tornos machines."

Arnold Douma, Exakt Fijnmechanika Director

22

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SUMMARY

"Sustainability is one of the most important goals of the group. CO_2-neutral production and energy-efficient machines are now an integral part of some customers' requirements."

Jérôme Kayser Managing Director of Tornos Technologies Deutschland

Setting out for new horizons

Jérôme Kayser Managing Director of Tornos Technologies Deutschland

Despite the difficult economic conditions, Tornos, the Swiss technology leader in precision turning machines, is investing in the new site of its German subsidiary. On October 1 of this year, Tornos Technologies Deutschland moved from Pforzheim to Heimsheim. Managing Director Jérôme Kayser explained the objectives of the move and his expectations.

dm: Unfortunately, the mood among machine tool manufacturers is currently subdued. What is the situation at Tornos and at Tornos Germany in particular?

Jérôme Kayser: *The drop in demand for machine tools is currently greater than in previous economic cycles. This is causing real problems for some of our competitors. Of course, we are also feeling the effects, but we are optimistic about the future. Our existing customers are at the forefront of technology and will soon be investing in new machines. And we have the potential to win new customers.*

dm: What are the reasons for that?

JK: *In recent years, we have reduced our dependence on the automotive industry and opened up new market segments in medical and dental technology and electronics. Secondly, we are fortunate to have a wide range of technologically advanced machines with an excellent price/performance ratio, and thirdly, we are working hard to improve our sales and service quality.*

dm: Nevertheless, there is a rumor going around in Germany that Tornos will soon be completely absorbed by Starrag after the merger?

JK: *I've heard that, but it's not true at all. Of course we will use synergies where it makes sense. But both companies are involved in different technologies and the Tornos brand is a force to be reckoned with in turning.*

dm: What advantages does Tornos have over its competitors?

JK: *It would go beyond the scope of this interview to list them all. Let me just highlight a few. Our machines have a multitude of technical features that our competitors can only dream of: The flexibility and concentricity of our multispindle lathes of less than 2 µm, the ease of programming of our control, the fast changeover from long to short parts, the constant high torque at all speeds, the extremely high thermal stability with warm-up times of less than half an hour, and the nine axes of our new Swiss XT, to name just a few. Tornos has been known for years for the technological superiority and precision of its machines. What is new is that we can now offer these machines at prices that are at least on a par with our competitors, and sometimes even lower.*

dm: Germany is becoming less and less attractive as a business location. Yet you are investing in a new German headquarters with its own showroom and training and technology center. What made you decide to do this?

JK: *Unfortunately, we Germans sometimes tend to be a bit pessimistic. Our industry is much more efficient than it is currently portrayed. We have excellent technicians and engineers, as well as courageous and responsible entrepreneurs. Our small and medium-sized companies will face the changes and successfully expand Germany as an industrial location. There will be clear shifts in the near future. The production of simple standard parts will decrease, new technologies will emerge and the requirements for the workpieces and their production will increase. All this suits Tornos. We were not and are not a supplier of simple standard machines in large quantities. We are a partner to our customers, working with them to solve highly complex requirements. This project business will grow over the next few years and we are ready for it. We have the right machines, the experience and the expertise.*

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“My top priority is still to have satisfied customers. Next year, we want to continue to expand our customer base and introduce the many advantages of Tornos to a wider circle.”

dm: And that’s why you’re opening the new site?
JK: That’s right. We’ve been planning this for a while, but it took us a while to find the right property. Now we can finally show what Tornos is all about. Our existing customers are aware of our strengths. However, many users have not really taken notice of us in the past. We had and still have the image of a small Swiss manufacturer of a few very expensive precision turning machines. But now we are an internationally active group with a broad portfolio of technologically leading machines at market-driven prices, without giving up our proven virtues.

dm: How do you intend to convince the market of this?
JK: We will significantly strengthen our sales and service organization in the coming months. The new location will also help us. It is conveniently located in the greater Stuttgart area and offers a pleasant working environment. At the same time, we look forward to welcoming our existing and prospective customers here. We will be proud to show them our machines and solutions.

dm: Will this also improve your training and service offerings?
JK: Absolutely. When we set up the facility, we made sure to make it as comfortable as possible for our training participants. In the modern training rooms and in our technology center, they can learn how to use their Tornos machines in theory and in practice.For our service department, the new site has finally given us the infrastructure they need to work efficiently.

dm: Talking about service, this has been criticized for years. Will the new location solve the problem once and for all?
JK: Objection. I have to stand up for our service here. Our people do a great job and are usually praised by customers. The problems you mention usually occur with machines that are more than 10 years old and due to communication problems. We will solve the latter at the new location and expand the team. At the same time, we will reorganize the spare parts supply to become even faster and better.

dm: Tornos has unleashed a torrent of innovation in recent years and has launched a large number of new machines. Will you be able to accommodate them all in your new showroom?
JK: Given the pace of innovation at our parent company, it might actually be difficult. At the moment, we have some models in the pipeline that will revolutionize turning, similar to the introduction of the first DECO series. Of course, we will try to present all these innovations in Germany as soon as possible. Our goal is also to have a machine from each series ready for demonstration in our showroom.

dm: Your Swiss headquarters is very committed to sustainability. Will some of these ideas be reflected in your new location?
JK: Sustainability is one of the most important goals of the Group. CO_2-neutral production and energy-efficient machines are now an integral part of some customers’ requirements. The building in Heimsheim is almost energy self-sufficient and has a minimal CO_2 footprint.

dm: What are your goals for 2025?
JK: My top priority is still to have satisfied customers. Next year, we want to continue to expand our customer base and introduce the many advantages of Tornos to a wider circle. Germany has huge potential that we need to better exploit with the right organization and commitment, the right technology and the right machines. I am confident that we will continue on our growth path and establish Tornos as an important brand in the turning industry.

"Tornos is completely part of our success. We have 20-year-old Tornos machines that are still holding tolerance and making good parts, day in, day out."
Yan Comment, president and owner, Abratec Swiss Precision

Built on Tornos

Yan Comment was born in Moutier, Switzerland—the birthplace of the Swiss-type lathe and the home of sliding headstock technology pioneer Tornos—and it's no accident that his screw machine shop in Oxnard, California, runs entirely on Tornos machines. Comment and his 10-person team celebrate the 20th anniversary of Abratec Swiss Precision, an enterprise proudly and entirely built on Tornos Swiss-type turning technology.

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Comment grew up in Court, a town with fewer than 1,500 residents, just five minutes by car from Moutier. He fondly recalls the important role Tornos played in the local economy.

'That picture in my head'

"I still have that picture in my head of myself as a kid, walking on the streets in that little town and seeing those transit vans carrying Tornos employees to and from work. The employees went down the valley to go to work in the morning, and then you could see the vans in the afternoon going back up to take those people back home from work," he said.

Back then, in the 1980s, Tornos was the biggest company in the whole valley.

"There were a lot of shops making tooling as well as parts for Swiss-type machines. I've heard that there was a screw machine in almost every garage," said Comment, who completed his first apprenticeship as an electronics technician.

“The Tornos DECO 10 is one of the greatest machines on the market. Today, Tornos’ DECO machines are everywhere in the world—and it’s because they are so good.”

Yan Comment
President and owner, Abratec Swiss Precision

After his mandatory Swiss military service, Comment was unable to find work in his field and accepted a job as a shop helper at Ihmof SA, a Moutier screw machining company that used cam machines and had some early computer numerical control (CNC) machines, including the Tornos ENC 74.

‘Why not?’

The Swiss machining industry was already struggling to find qualified setup personnel and Comment’s boss, Michel Ihmof, was instrumental in establishing an adult continuing education program for this field and offered him the opportunity to start a second apprenticeship. Comment jumped right in.

“Plus, I like cars, and I always saw that machine setup guys were always driving nice cars, so I thought they must be making good money,” he confided.

Meanwhile, Comment’s uncle, Romain Champion—a screw machinist who had moved to California—and his boss, Earl Crews, offered him the chance of a lifetime: an 18-month work experience in the United States at Antrin Enterprises. Comment’s response: “Why not?”

"By then I was a technician in electronics and a certified screw machinist. I figured I would go, learn English, start learning CNC machining, and come back to Switzerland as the perfect candidate to work for Tornos as a technician installing and repairing Tornos machines," Comment said.

The adventure begins

On July 2, 1996, Comment boarded a plane in Geneva bound for California, an adventure that triggered a cascade of life-changing events: On the plane from Amsterdam to California, he met a friendly Dutch passenger named Michiel who had a girlfriend in the US.

"I eventually went to visit them, and that's where I met Michiel's girlfriend's sister, Alili. We were married within a year," Comment said.

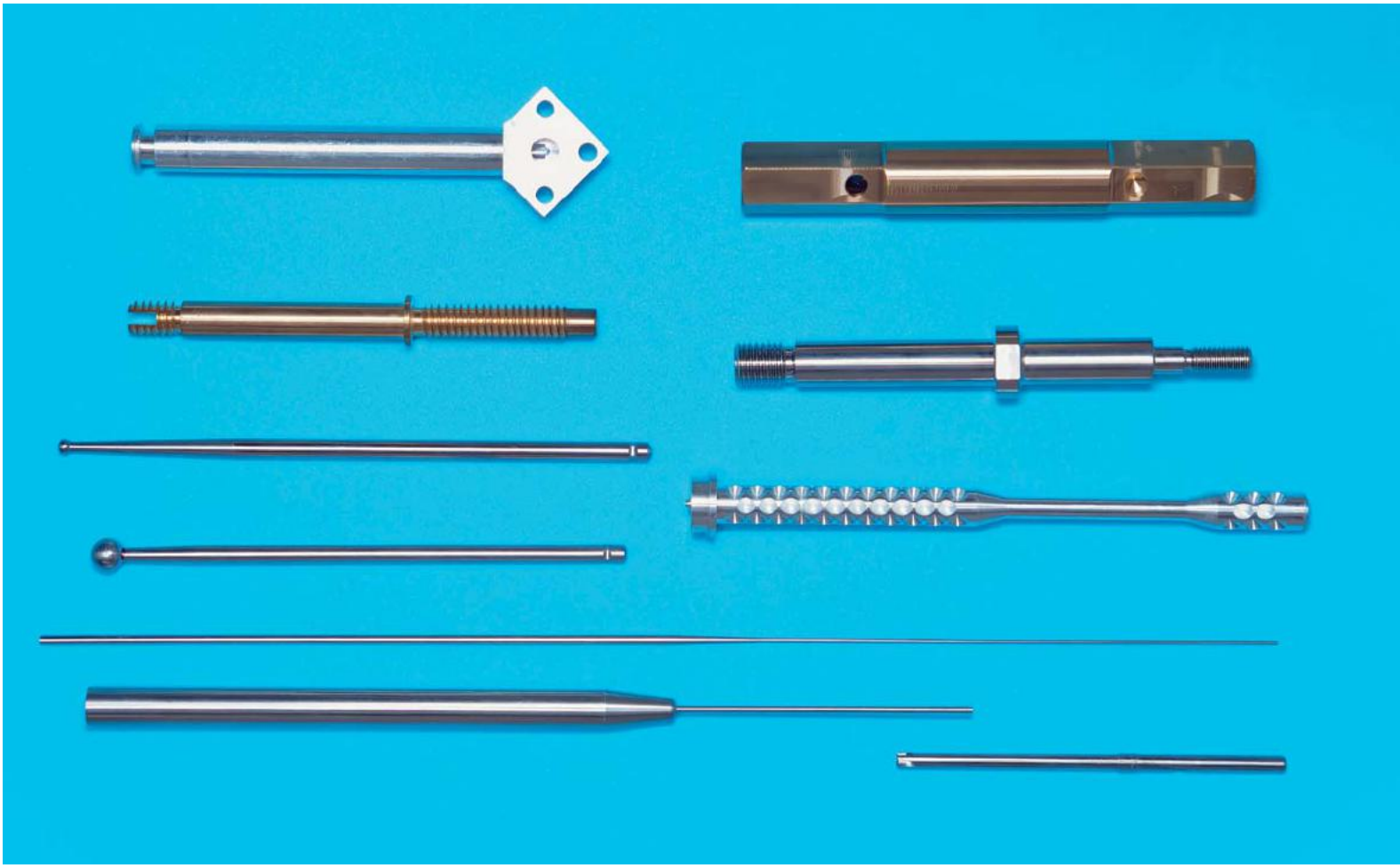
Turning to Tornos

Everything was coming together: Comment had a job, he and Alili had begun dating, and he had begun learning how to use Tornos CNC machines—beginning with ENC 74 and 164 and then the DECO 10 which was launched in 1996.

"I think the Tornos DECO 10 is one of the greatest machines on the market," he said. "I always say that I'm Tornos' biggest fan and I really am. I love Tornos machines. They are in my heart, they're from my town and my country—and Tornos helped put Moutier and Switzerland on the map. Today, Tornos' DECO machines are everywhere in the world—and it's because they are so good."

Fast-forward eight years to 2004: Comment had arrived at a crossroads. The company he was working for offered no potential for his professional growth, so he bought two used Tornos machines—a DECO 10 and a DECO 13—and started Abratec Swiss Precision. He worked at the shop at night and on weekends. "Alili played a key role with her business and accounting knowledge," said Comment.

Today, Abratec Swiss Precison is a full-service screw machine company supplying a wide variety of precision components, from the very basic to the very complex, of a wide variety of materials. The company serves a range of market segments, producing bone screws and medical fasteners for the medical industry; sockets and contacts for electronics, as well as parts for automotive, aerospace, and commercial applications. With 80 percent of its customers in California, Abratec Swiss Precision has 50 active customers, produces 3–4 million parts—ranging from 1–26 mm in diameter—per year, and ships parts to 20 different customers each month. All of the company's Tornos machines have bar feeders and are designed to work 24/7.



New life for a workhorse machine

The business, which started with just two people, today employs 10, and its workshop boasts 23 Tornos machines, including a Sigma 8, six DECO 13s, three DECO 20s, three DECO 26s, eight DECO 10s, one EvoDECO10 and a brand-new, recently delivered DECO 10 Plus.

"I would have liked to have seen the DECO 10 Plus program about 10 years earlier and I even suggested it," Comment said enthusiastically. "These machines are very capable and reliable and Tornos' TB-DECO system is also very capable. These machines can do everything from simple pins for electronics to very complex medical parts."

Comment explained that it can be difficult for small "mom and pop" shops to afford new Tornos machines, and the DECO 10 Plus program—launched to celebrate the 25th anniversary of the DECO 10—offers a solution by transforming workhorse DECO 10s into fit-for-the-future DECO 10 Plus machines. Under the program, DECO 10s are completely refurbished, including:

- *The latest-generation FANUC CNC with USB connectivity and Industry 4.0 readiness*
- *Restoration of the machine's geometry and precision to original condition*
- *Better lighting and improved ergonomics thanks to a pivot arm and new keyboard*
- *Availability of spare parts to guarantee another 25 years of performance*
- *Access to success-enabling options like Tornos Active Chip Breaker Plus (ACB Plus) software, maintenance contract, and connected services*

Looking to the future—with Tornos and the next generation

As the Comments look to the future of Abratec Swiss Precision—a company built entirely on their leadership, the team's hard work, and Tornos Technology—they know they can count on Tornos to keep the business turning and to help train the next generation. The couple's 20-year-old son, Ryan, has been exposed to the business his whole life and, for the past two years, has been learning all aspects of Abratec Swiss Precision.

The future looks bright for the business as it marks its 20th anniversary.

"Today we have eight DECO 10s and of course it would be great over time to have them as well as our DECO 13s, DECO 20s, and DECO 26s returned to new condition through the DECO 10 Plus program," he said. "A lot of companies make good machines, but I do believe Tornos machines are built better. Tornos has an edge as far as the knowledge they've carried for years. Tornos is completely part of our success. We have 20-year-old Tornos machines that are still holding tolerance and making good parts, day in, day out."

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The modern Dawnlough Precision site in Galway is expanding thanks to the Bumotec turn/mill centers.

Bumotec solves medical production puzzle for Dawnlough Precision

Dawnlough Precision is a subcontract manufacturing business that has traveled a relentless journey of growth since it started manufacturing tooling for the aerospace and medical industries back at the start of the millennium. The ascension to success over the last 20 years has arrived through an aggressive growth strategy and investment in high-end machine tools. Part of this high-level investment journey has included the arrival of two Bumotec 191^{neo} turn/mill centers from Starrag.

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Initially founded in 1987, the turn of the millennium has seen the Galway manufacturer gain accreditation to ISO:9001, ISO:13485 and AS:9100D, establish a design department and increase its manufacturing facility – firstly to 20,000 sq/ft and then to 50,000 square feet (4,465 square meters) in 2018. Underpinning this growth is a robust business strategy and the adoption of advanced production tools such as FMEA, PPAP and SPC. The robust management of processes and production is a necessity for the Irish manufacturer to succeed in two of Ireland's core manufacturing sectors.

To maintain its growth trajectory, Dawnlough has invested in the most flexible, capable and productive machine tools – and this is why it has recently taken delivery of two Bumotec 191^{neo} machines. The world-class production facility on the West Ireland

A fenestrated clamp manufactured on the Bumotec 191^{neo} machines in "one hit": Without the Bumotec machines, Dawnlough would not have been able to produce these parts in "one hit" with a price-competitive solution for the customer.

coast has more than 54 CNC machine tools run by a highly skilled and experienced workforce dedicated to providing premium manufacturing solutions. Recently acquired by the Acrotec Group, the 110-employee business is still run by longstanding Managing Director and previous owner Brian McKeon.

Looking at the path the business is taking, Keith Kennedy, Aerospace Production Manager at Dawnlough says: "We manufacture high-precision components for the aerospace and robot-assisted surgery (RAS) industries as well as tooling and production aids for the medical device sector. When I started in 2006, tooling was the main business focus, but as the aerospace and medical device industries have expanded locally, this presented many opportunities. Our aerospace work started with seating components for Rockwell Collins, which led us to 5-axis machining. We then progressed to flight-critical components for the likes of Spirit Aero Systems and Pratt & Whitney. Similarly, we progressed from manufacturing medical tooling and instruments to producing complete assemblies."

"The big thing about Bumotec was the flexibility. It offered everything we wanted."

Keith Kennedy
Aerospace Production Manager, Dawnlough Precision

As Europe's largest employer of medical device professionals per capita, Ireland is renowned for its medical industry expertise. As a country with a medical sector that employs more than 42,000 people in more than 450 businesses and exports more than 12.6 bn € of medical equipment, Dawnlough is well positioned to serve this continually expanding segment.

Discussing the expansion in the medical industry, Keith continues: "Our core business has predominantly focused on vascular work and from this, we have expanded our offering. We now produce an array of components for our RAS customers as well as consumable.

The first Bumotec on the Emerald Isle

It is here that the search for a suitable machine led Dawnlough to purchase a Bumotec 191^{neo} FTL-R in June 2022. Discussing the acquisition, Keith recalls: "We had several components we initially targeted for this type of machine."

"We needed a machine with very high levels of accuracy, short cycle times and incredible efficiency because it's a very competitive market. We visited many companies reviewing high-accuracy machines, but it's only as you look closer and purchase one of these machines for this type of work – you really see the 'value-add' they bring. We were looking for repeatability, flexibility, high spindle speeds, the ability to machine hard material and 2-3 µm precision on production runs. We had very specific requirements and we were not sure if it was going to be achievable."

"Some of our initial trial parts were 46HRc and we are using tools from 0.1 to 0.5 mm. We needed repeatability of 2 to 3 µm, but we needed to hold that overnight. Some of the functions of the Bumotec machine such as the software for monitoring the machine, the cutting load, the contact cutting time and the large 90-tool automatic tool changer (ATC) that enable us to have sister tooling in the machine are incredible."

"It was a huge investment for our business. It was an unknown risk, but the Bumotec ticked all of our boxes and end goals. The big thing about Bumotec

"On the purchase of the second machine, we knew exactly what Bumotec could offer, so we worked with them remotely."

Keith Kennedy
Aerospace Production Manager, Dawnlough Precision

The two Bumotec 191^{neo} machines are the centerpiece of the new department at Dawnlough Precision.

“The Bumotec 191neo is an exceptional machine with accuracy that takes our business to a different level.”

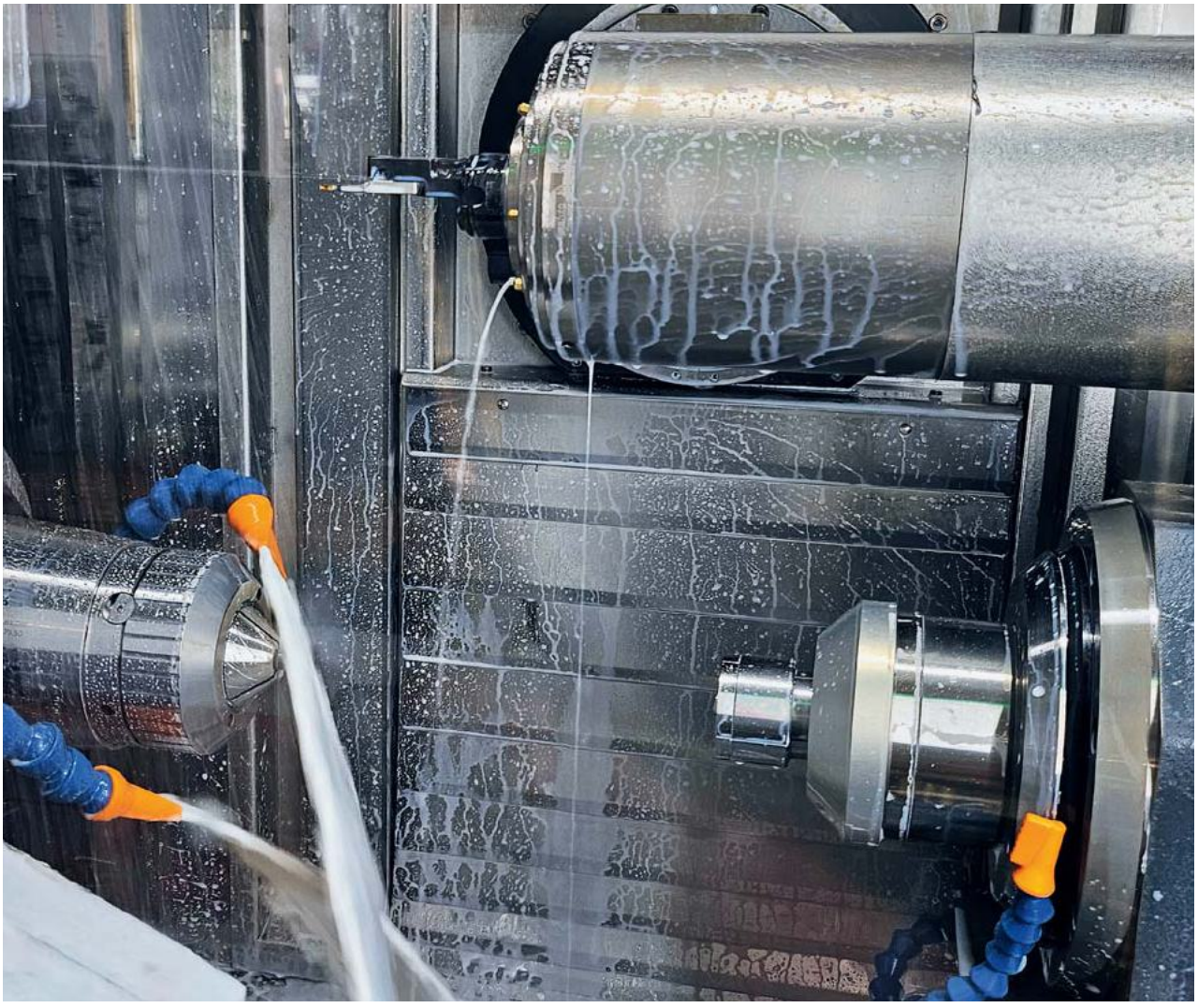
Keith Kennedy
Aerospace Production Manager, Dawnlough Precision

was the flexibility. It offered everything we wanted. It's an exceptional machine with accuracy that takes our business to a different level."

As well as machining 46 HRc parts, there was also a need for specific RAS parts that were a key driver to the first Bumotec installation, Keith says: "We were machining these parts in batches of 200-off up to six times a year and there are 6 different parts in the family with a projected ramp-up of 200 – 300 % a year. So, we wouldn't have been able to support the customer with our existing method. There was also a fallout due to accuracy, as we couldn't 100 % meet the GDT accuracy."

"We needed to put a bar diameter in the machine up to 1.5 inches while also running high-precision production runs of small instrumentation parts.

The work envelope of the Bumotec 191neo FTL-R with the subspindle was the first Bumotec machine to arrive in Ireland in June 2022.



The Bumotec also had the subspindle and a robotic unit which was important, as we need traceability for every part we make. We took demonstration parts and gave Bumotec our end goal. We went to Switzerland in April 2022 and we received the machine in June."

Success brings machine number two...

Following the remarkable success of the Bumotec 191^{neo} with FTL-R configuration, the Galway company then added a second Bumotec 191^{neo} in March 2023. Supplied with an FTL-PRM configuration, the second Bumotec 191^{neo} was introduced with complete automation and a 20-position pallet station for lights-out production.

"We have also made considerable savings on tool costs and changeovers in comparison to our machining centers and this is a credit to the 40,000 rpm spindle."

Eddie McHugh
General Manager, Dawnlough Precision

Discussing the arrival of the second Bumotec machine, Keith continues: "When it came to the first machine, we had a vision and a target and Bumotec delivered on that. What they offered us with the second machine was a complete turnkey solution for our instrumentation components. We had given them a target of for producing instrument parts from a much harder material. This still required extreme levels of precision and production volume with the flexibility to produce families of parts."

Keith Kennedy (left) discussing a medical instrumentation part with Senior CNC Engineer Ronan Faherty

"We needed to machine materials from 46 to 52 HRC such as 17-4 and 420 stainless steel as well as titanium. The instrument parts for use in invasive robotic surgery include tools like grippers, cutting instruments and scissors. We have made many instrumentation components as well as parts of the robotic unit that actuates the instruments. We are producing the parts in medium- to high-volume runs across two different parts in various quantities per month."

Some of the parts had very long cycle times on the five-axis machines and this needed to be reduced to below 30 minutes with 48 HRc material. Not only was the cycle time a challenge, but once again Dawnlough had to attain extreme precision levels in a production environment with the flexibility to produce upward of 30 different components. Initially machining 20 to 50 parts a month, the schedule was set to rise rapidly to 200 parts per month before reaching

production volumes – numbers not possible on a 5-axis machining centre. "It was a learning curve to move from aerospace work to the niche market of medical instrumentation. We didn't have the machine technology to produce the parts to the specifications and production cycles required, but our managing director works on the philosophy of 'build it and they will come'."

"On the purchase of the second machine, we knew exactly what Bumotec could offer, so we worked with them remotely. Based on what we had seen previously, we knew they were the best option. What Bumotec offers is exceptional and way beyond anything we had anticipated. With the original Bumotec 191^{neo} FTL-R machine, we had the subspindle, but with the next set of parts we needed the Bumotec 191^{neo} FTL-PRM.

With this machine, we had the option of the vice, a 3 m bar feed and also a robot loader. We needed the robot loader for traceability. It also expanded the capacity of the machine where we could go from 50 mm barfed stock to 80 mm billet loading and unloading from the robot."

"The subspindle option we had on the FTL-R wasn't feasible for the parts we needed, whereas the FTL-PRM gave us two vices. Without the vices, we would have needed to undertake secondary machining, which would have been difficult given the requirements, so to be able to pick up the component in the vice and conduct the second operation in a single cycle was key to finishing the parts – it was another turnkey solution."

Contributing to the conversation, Dawnlough's General Manager, Mr. Eddie McHugh adds: "We were machining parts on our 5-axis machining centers and we needed to increase output by 400 %. We were machining around 400 parts a month on two different products with a cycle time of 45 minutes. This was tying up two machines and one man permanently every month. On second and third shifts with fewer staff, we had concerns about machine tolerance drift, so output was reduced and it also made inspection labor intensive."

Looking at additional savings with the arrival of the Bumotec 191^{neo} FTL-PRM, Eddie adds: "There is a labor saving with one man running two machines around the clock. Additionally, with the pallet loader, the parts are loaded into the machine and back to the pallet loader in a specific order which made huge savings on inspection. We have also made considerable savings on tool costs and changeovers in comparison to our machining centers and this is a credit to the 40,000 rpm spindle."

"The service from Bumotec is probably the best we have had."

Eddie McHugh
General Manager, Dawnlough Precision

With 54 CNC machine tools from 10 different manufacturers, Dawnlough has one machine alongside the two Bumotec 191^{neo} that is commonly used in the medical industry. Comparing this machine to the Bumotec, Keith continues: "In comparison, the Bumotec has increased capacity, it has a larger tool library, higher spindle speeds, a larger diameter bar capacity and a lot of other features that just offers so much more flexibility. It's not only a better and more flexible option, it's a more robust machine which is what we need – especially as we machine everything from very small medical components to 42 mm bar from hard materials." Referring to the robust build of the Bumotec 191^{neo} compared to the alternate machine in the small part machining department, Keith recalls a story saying: "One night, we were machining 42 mm diameter aluminium between centers on the Bumotec 191^{neo} and a tool broke. When trying to pick the part from the subspindle, the machine bent the 40 mm bar. The next morning, we spoke to the service team, reset and recallibrated everything and started running the machine at our 2 – 3 micron tolerances. On the competitor machine, we had a 6 mm tool that chipped off a vice and tripped the machine out, the machine was subsequently down for 3 weeks and cost us 15,000 € in service, as the whole machine had to be disassembled and rebuilt. That is when you know to buy the second Bumotec machine because the stability, rigidity and overall build quality is second to none."

The future

Looking to the future, Dawnlough has plans for more Bumotec machines and expansion, which will certainly continue with the ambition of the Acrotec Group. "The machines are extremely flexible with a large 90-tool capacity. This means we can just change the programs over, the jaws and collets and it is ready to go in less than 2 hours. For our high-precision business that manufactures mid to high volumes with a high mix of complexity, the Bumotec is the perfect machine for our business."

Service

As a company located on the west coast of Ireland, Dawnlough is well positioned to serve its customers, but its machine tool suppliers have not always served Dawnlough with a level of customer support that a leading manufacturer would expect and deserve. Referring to the service and support from Bumotec, Keith concludes: "The service is exceptional.

There is absolutely no comparison to some of our other machine suppliers. Starrag is a brand with a limited footprint in Ireland and I believe our Bumotec was their first machine in Ireland. Despite other brands having a larger footprint in the area, the Bumotec support is second to none. The after-sales support is unbelievable. I don't think there is another machine brand we have at Dawnlough that offers the same after-sales support – and we work with at least 10 brands." Eddie concurs by adding: "The service from Bumotec is probably the best we have had. If you need engineering support they are there straightaway, whether it's engineering support, post-processors, technical queries or anything else. The support has been fantastic."

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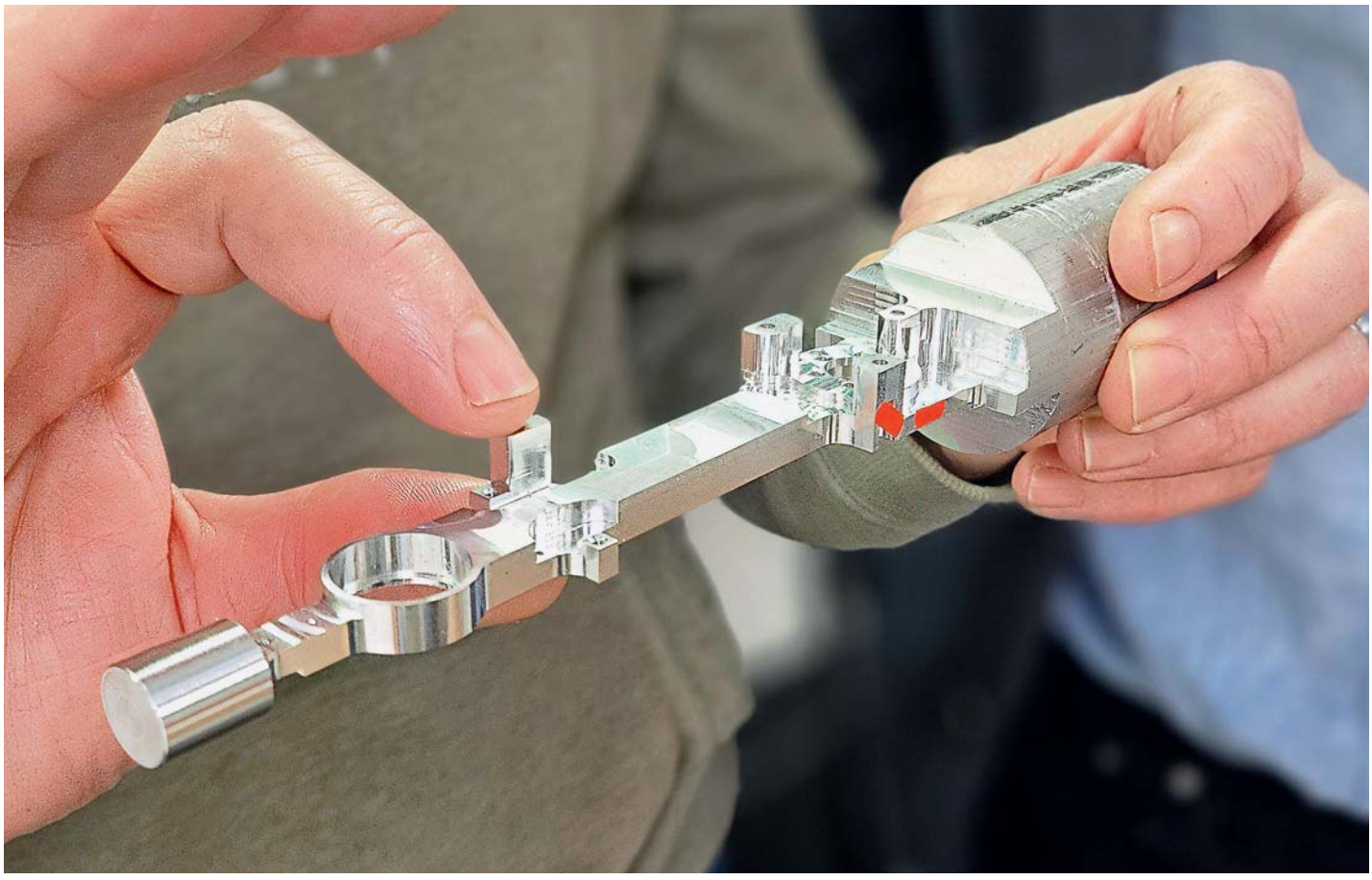
Dawnlough Senior CNC Engineer Eric Leclos shows how an intricate aluminium medical device part is manufactured in "one hit" on the Bumotec 191^{neo} with a cycle time over 70% less than before the Bumotec machines arrived.



Long-turning specialists Mihai Mihaltan (left) and Ranjdar Junaid Ismael are satisfied with the SwissNano 4.

Exakt Fijnmechanika from the Netherlands focuses on

complex precision mechanical long turning work with Tornos

No fewer than eight Tornos long-turning machines are currently operating nonstop at Exakt Fijnmechanika in Drachten. The facility, which resembles a clean room, is fully dedicated to the stable production of high-precision turned parts for the medical industry and other sectors.

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In 2010, Exakt Fijnmechanika acquired its very first long-turning machine, a Tornos Micro 7, to produce 500,000 cannulas each year for ophthalmology. This product is a hollow tube—similar in size to a needle—used in eye surgery to penetrate the eye and remove fluid or treat certain conditions.

"These types of products must meet the highest standards in terms of dimensions and surface finish. A defect in such a product can result in irreparable damage. That is why we set very high standards for our machinery, and since 2010, Tornos has consistently proven that it can more than meet these requirements," Exakt Fijnmechanika Director Arnold Douma said enthusiastically.

Swiss quality

The reason Exakt Fijnmechanika chose Tornos has everything to do with the quality and accuracy of the machines. In long turning, it is essential that the process runs stably to ensure high precision and repeatability.

"At the time, Tornos was one of the few machine builders that could meet our requirements. The Micro 7 was perfect for our starting material with a diameter of 4 mm and was developed in collaboration with leaders in the watchmaking industry," Douma explained. "Given the similar demands for precision manufacturing, we were simply charmed by Swiss precision, making Tornos the logical choice."

Pushing the boundaries

Today, Exakt Fijnmechanika still produces cannulas in large quantities, but other long-turning projects have been added over the past decade. For the medical industry, the company also manufactures small parts for insulin pumps and sharp needles with a radius of less than 5 micrometers. For the defense industry, Exakt Fijnmechanika produces components with very low Rz values used in night vision goggles.

"These are just a few examples," said Douma, showcasing a wide range of precision mechanical turned parts. "We specialize in high-tech turning. When you are pushing the boundaries of what is feasible, you have to be willing to make mistakes. That's the only way to progress."

The compact SwissNano 4 is equipped with a glass dome that can be fully opened, providing full access to the machining area. The machine also features user-friendly controls.

“Even with small diameters, there are no vibrations, which allows us to produce all night long with process reliability.”

Eight Tornos long-turning machines

Due to increasing demand and positive experiences with both Tornos and Gibas—Tornos’ official distributor in the Netherlands—Exakt Fijnmechanika added a SwissNano 4 to its equipment lineup in 2015. This model succeeded the Micro 7 and features improved user-friendliness in terms of both control and accessibility to the machining space.

“We program directly on the machine to maintain optimal control over the process. With the SwissNano 4, this has become much easier due to the user-friendly interface. Another great feature is the construction of the machine. The glass dome, which can be fully opened, provides complete access

Overview of the machine park

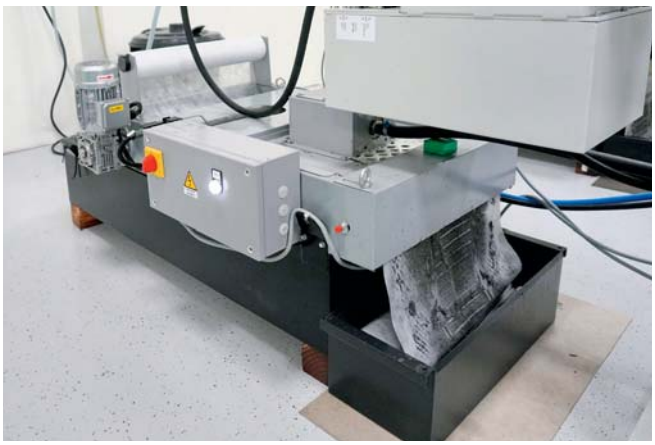
to the machining area. Despite the 14-year difference between the Micro 7 and the newer models, the performance, accuracy, and cycle time remain very consistent. That is a testament to Tornos' quality," Douma noted.

Leaving nothing to chance

Between 2015 and today, six additional SwissNano 4 long-turning machines have been added to Exakt Fijnmechanika's workshop, bringing the total to eight. All machines have a maximum bar capacity of 4 mm, which is also the diameter of most starting materials. However, Exakt Fijnmechanika also processes smaller diameters down to 1 mm. The compact long-turning machines have six linear axes, two C axes, and 13 tools, four of which are driven. Each machine is equipped with a high-frequency spindle capable of speeds up to 16,000 rpm on both the main and subspindles.

"We sometimes drill holes of just 0.2 mm in diameter. In such cases, 16,000 rpm isn't enough, so it takes a bit of magic to successfully complete these types of

The paper belt filter system is one of the solutions that guarantees high process reliability.



Thanks to a bar loader, Exakt Fijnmechanika can produce large series efficiently.

A variety of precision mechanical turning parts produced with Tornos machines

operations," Douma explained. "Everything has to be perfect, from the alignment of the machine to the quality of the cutting oil, temperature control, and tooling—especially for unmanned production."

Reliable and unmanned production

Because Exakt Fijnmechanika produces large series ranging from 1,000 to a million pieces, all Tornos long-turning machines are equipped with LNS Tryton bar feeders. According to Douma, this bar loader is ideal for automated production of small-diameter workpieces.

"Even with small diameters, there are no vibrations, which allows us to produce all night long with process reliability," he said.

While Tornos machines are known for their thermal stability, Exakt Fijnmechanika leaves nothing to chance. Seven employees dedicated solely to quality control are proof of that commitment.

To ensure maximum process reliability, all long-turning machines are housed in a temperature-controlled room.

"At a constant temperature, there's no need for compensation, which greatly enhances process stability," Doua said.

Furthermore, Gibas has equipped several machines with a paper belt filter to maintain optimal cutting oil quality, preventing small chips from damaging the tool or workpiece.

"All in all, we are extremely satisfied with Tornos' long-turning machines and the support from Gibas. We still have some space available in our long turning department, and we will undoubtedly fill it with more Tornos machines," Douma said.

exakt.nl

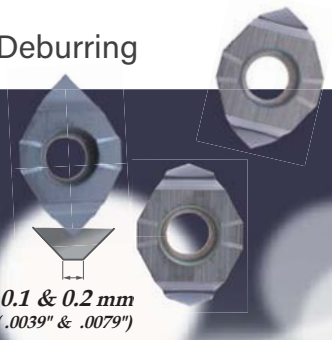
X060 Series

Spotting / Engraving / Deburring

0.1 & 0.2mm

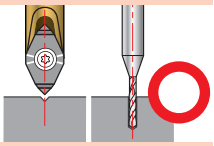
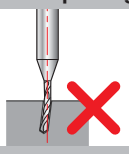
Micro Spot Drill

90° / 120° / 142°



0.1 & 0.2 mm
(.0039" & .0079")

* Most of hole size in Swiss type lathe or small milling machine is between 0.2~1mm.

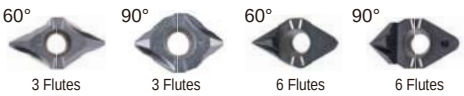
Spotting + Drilling	Without Spotting
	
Better position accuracy and diameter tolerance.	Resulted off-center drilling, poor hole quality and reduced tool life.

- **To improve hole location and tool life of a deep hole drill or micro drill.**
- **One holder supports the entire X060 series insert.**
- **Carbide insert can stand very long tool life.**

Spotting

Engraving

Deburring



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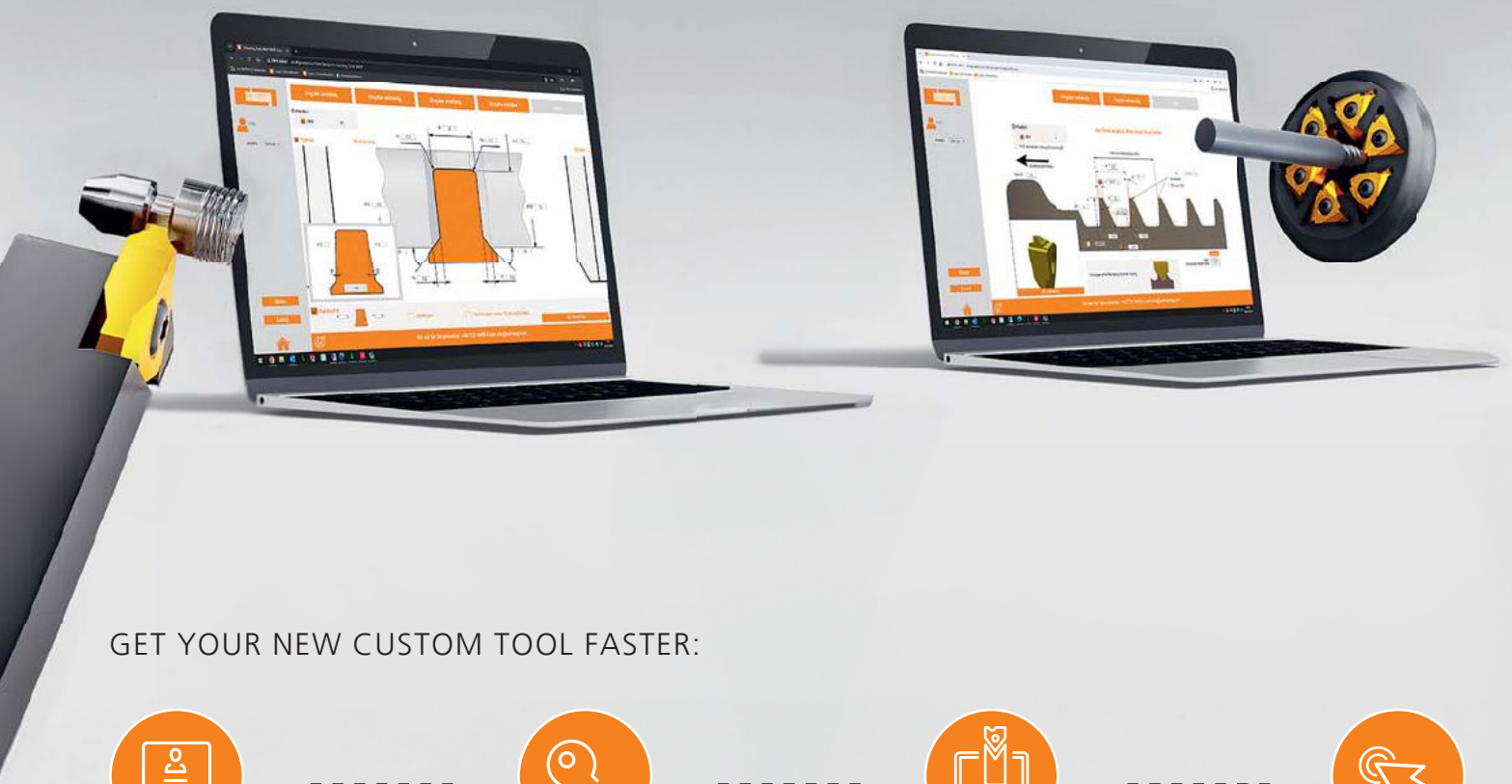

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A crowd of enthusiastic visitors explores the Tornos booth at IMTS 2024, where the Swiss Machining Academy was launched.

THE SWISS MACHINING ACADEMY: democratizing bar turning know-how

Introduction to high-precision machining

High-precision machining is a complex discipline, where every detail counts and every mistake costs. For those who want to learn the tricks of the trade, Tornos has taken an ambitious gamble: to make the basic know-how of its bar-turning machines accessible through the Swiss Machining Academy, in collaboration with Titans of CNC.

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The aim of this initiative is to reduce the barriers to learning precision machining and to offer everyone the chance to learn the most advanced techniques, free of charge. The goal is to make machining-related skills more open and accessible, enabling every learner to feel capable of mastering a technology often perceived as elite.

The Swiss Machining Academy doesn't just offer educational content: It creates an immersive training environment where every step is carefully designed to guide users toward complete mastery. The curriculum ranges from machining fundamentals to highly advanced procedures, guaranteeing a gradual and consistent advance in competence. Each module is enriched by practical demonstrations, enabling learners to visualize the machining process and understand the subtleties that make Swiss-type and multispindle machining an art. This initiative is

The Swiss Machining Academy: Free, accessible tutorials to democratize precision machining skills.

TITANS OF CNC SWISS MACHINING ACADEMY

swissmachiningacademy.com

based on Tornos' and TITANS of CNC founder Titan Gilroy's belief that the future of the industry depends on the ability to share knowledge and encourage potential talent, whatever one's previous experience.

A project revealed at IMTS

Gilroy and TITANS of CNC Swiss Machining Supervisor Donnie Hinske unveiled the project in September 2024 at the International Manufacturing Technology Show (IMTS) in Chicago, United States, in front of an audience of almost a thousand people. The first machine to be showcased on the Swiss Machining Academy's educational platform is the Swiss DT 26 HP, an iconic Tornos machine adapted to the needs of apprentices and experienced professionals alike. The aim is clear: to offer a solid bar-turning foundation, free of charge and for everyone.

Finding qualified operators is increasingly difficult throughout the world—a true global constant. In many countries, young people are turning to other professions, making it essential to facilitate access to education. The Swiss Machining Academy videos cover not only the basics; they also help to optimize the use of machines, improve their efficiency, and tackle complex subjects such as programming with macros. This hands-on, educational approach enables users to acquire skills that would otherwise be unattainable without years of intensive practice.

A platform for everyone

The Swiss Machining Academy website, accessible via swissmachiningacademy.com, is designed to make learning bar turning accessible, segmenting instructional videos into simple steps. The site features an intuitive interface and progressively structured resources to guide users of all levels. Users start with the basics—an introduction to the machines and how they work—before progressing to the creation of complex parts.

These videos are a springboard for those who want to start machining or broaden their skills without financial barriers, with quick and easy access. Hinske is particularly pedagogical, offering clear explanations and step-by-step demonstrations that make understanding easy. The TITANS of CNC team has invested hours in producing these high-quality videos, which make understanding the complexities of bar turning affordable for everyone. The various modules are designed to cover the entire process, from tool selection to mastery of cutting parameters, while encouraging self-education.

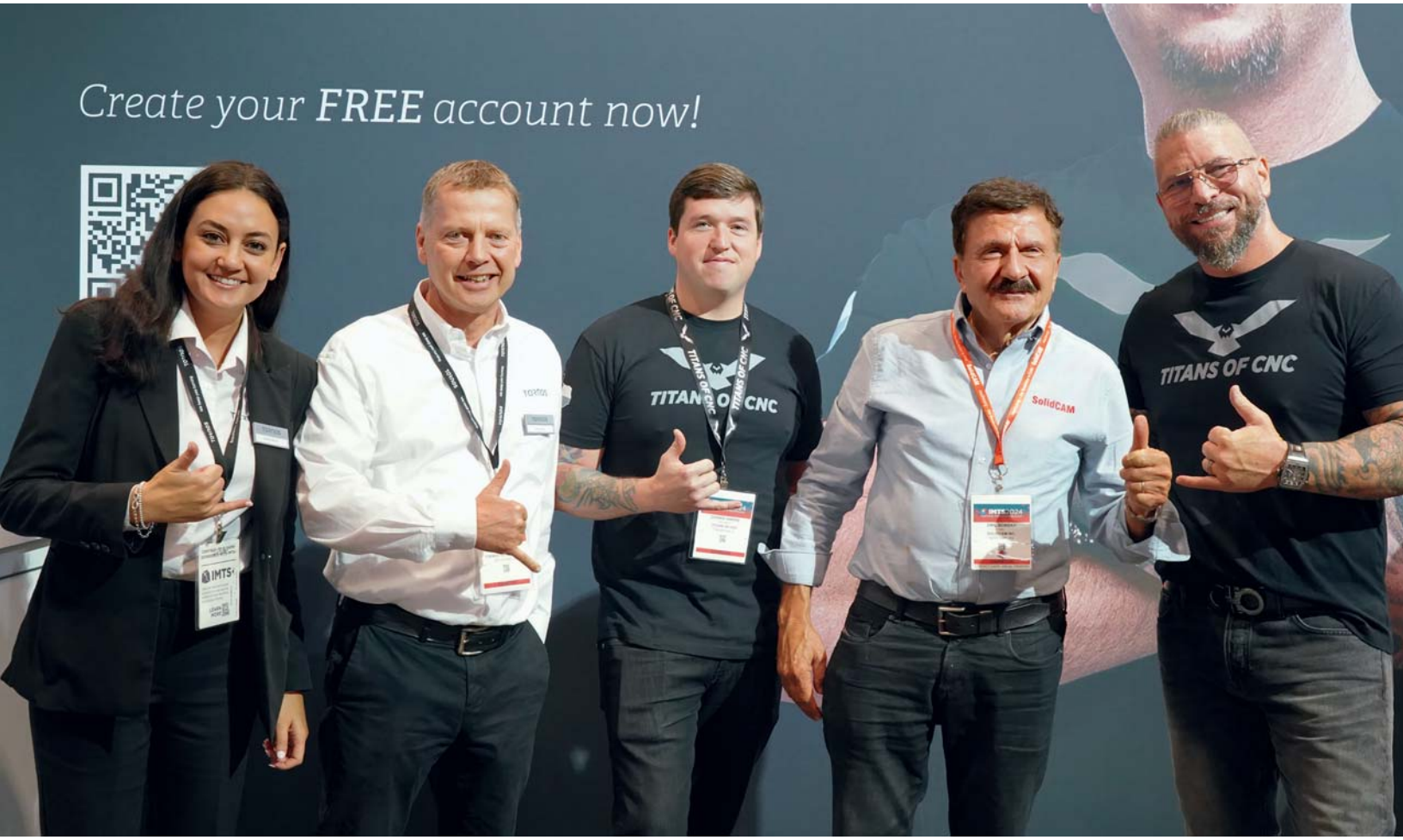
A community of learners

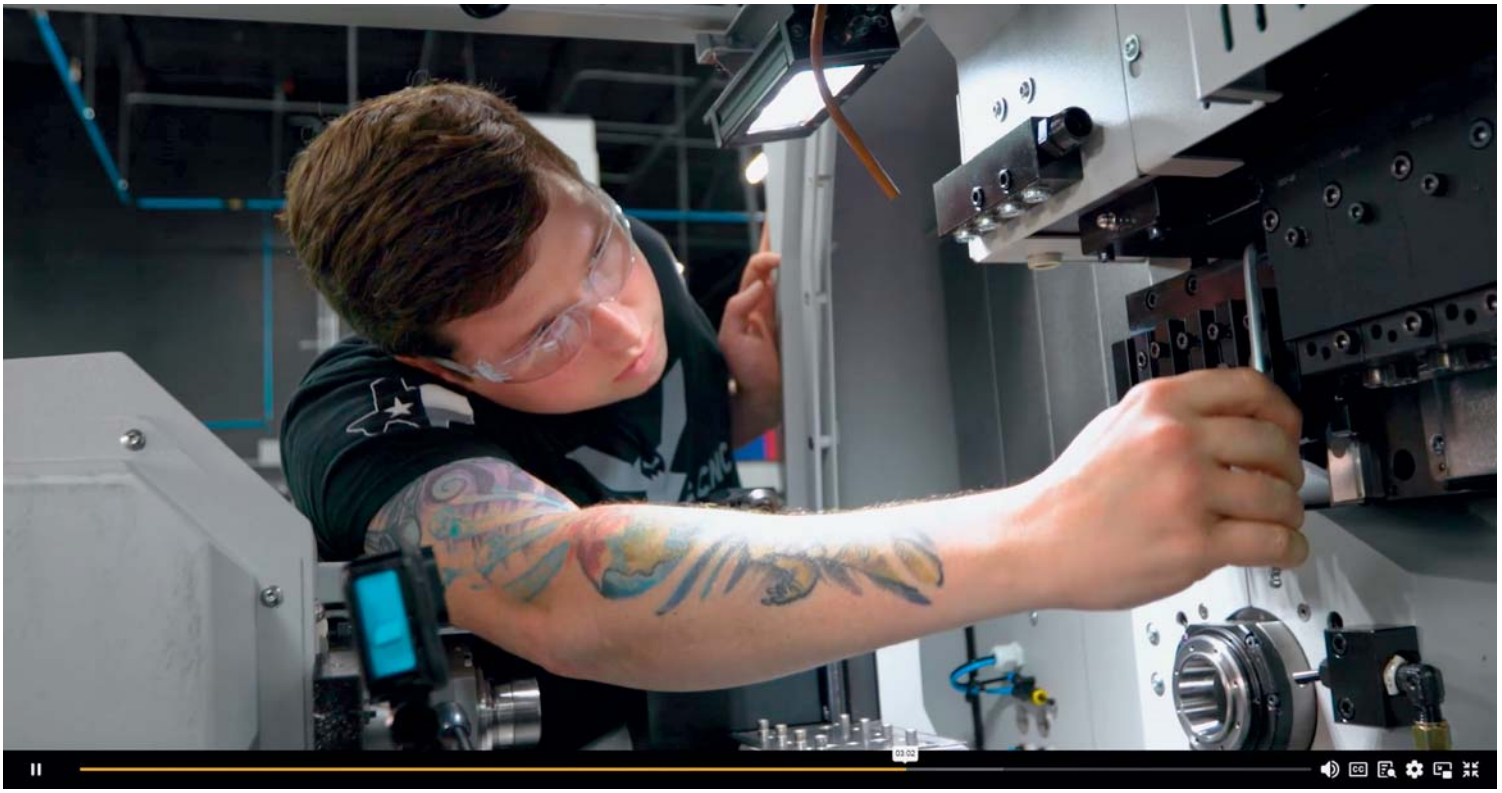
In addition to training modules, the site features sections dedicated to practical tips and demonstrations of specific applications. An online community is also available, enabling users to ask questions, share challenges and learn from each other. This global community reinforces the feeling of belonging to a network of Swiss machining enthusiasts, where each learner is encouraged to progress at his or her own pace.

The history of Swiss-type bar turning

The history of Swiss-type bar turning is also worth mentioning. Originating in the Jura region of Switzerland, Swiss-type turning has its roots in the watchmaking industry of the 19th century. Initially designed to manufacture the tiny components needed to produce high-precision watches, Swiss-type turning technology quickly established itself as a standard in the high-precision field.

From left to right: Naiane Nunes, General Manager of Tornos US, Jens Thing, CEO of Tornos Group, Donnie Hinske, Swiss-type Supervisor at Titans of CNC, Emil Somekh, CEO of SolidCAM, and Titan Gilroy, CEO of Titans of CNC — celebrating the launch of the Swiss Machining Academy at IMTS.





Donnie Hinske demonstrates tool holder installation, guiding users step-by-step through precision techniques.

These machines, known as automatic lathes or décolletage lathes, were developed to meet the specific needs of the watchmaking industry, which requires extreme precision and continuous production. The unique design of the Swiss-type lathe enables constant support to be maintained on the workpiece, ensuring great stability and unrivaled precision, characteristics that are still the hallmarks of Swiss machining today.

Bar turning: essential to our daily lives

Bar turning is at the heart of daily life. Without it, no airplane could fly, and the same goes for cars, which could not run without the components machined by this technology. Electronic connectors, surgical instruments and even everyday objects like coffee machines are all made possible by bar turning. This process is essential to modern living, so it's crucial to keep it going. The people who operate bar turning machines are the "surgeons of mechanics," the everyday heroes who help keep the world moving and evolving. This is also the basis of the Tornos motto: "We keep you turning."

The Swiss Machining Academy is first and foremost an initiative to make high precision more accessible, to inspire the next generation of bar-turning specialists, and to keep the industry moving toward greater innovation and shared knowledge. It is the perfect illustration of Tornos' commitment to supporting innovation and contributing to the development of essential technical skills. By constantly expanding the content available and adapting it to users' needs, the academy is preparing for a future where high-precision technology will be within everyone's reach, propelling the industry to new heights.

tornos.com

Even for machines sold over 30 years ago, spare parts like these levers are still available, ensuring longevity and productivity.

An optimized spare parts ordering portal:

simplicity and efficiency at your fingertips

Imagine a world where ordering a spare part is as simple as a few clicks—a world where you can instantly check the availability of a part and its price, at any time, with total flexibility. This is what the Tornos online portal— available in French, German, English, Italian and Spanish—offers. More than just an ordering site, it's a real ally in optimizing the management of Tornos machines.

TORNOS

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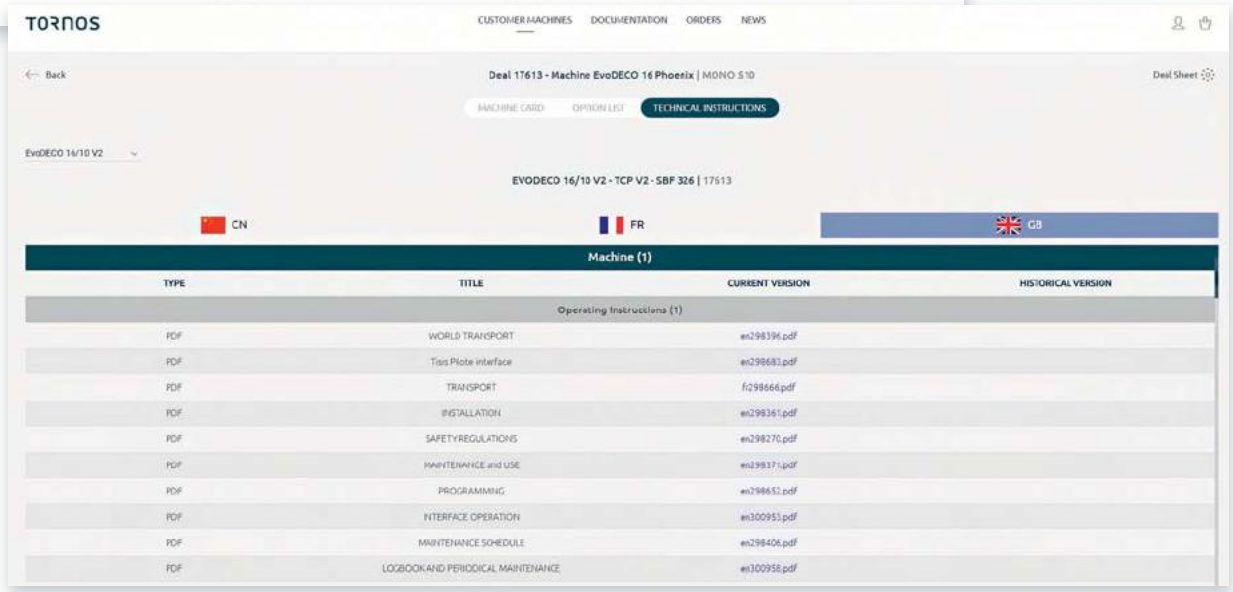
Why choose the online shop?

Customers can, of course, continue to order spare parts by telephone or e-mail, but the online portal offers an unrivaled experience. Now, thanks to the integration of single sign-on (SSO), access is smoother and more secure than ever. There's no need to remember multiple IDs and passwords: SSO allows you to log in to all services with a single account. This simplifies life, reduces the security risks associated with multiple passwords, and saves time.

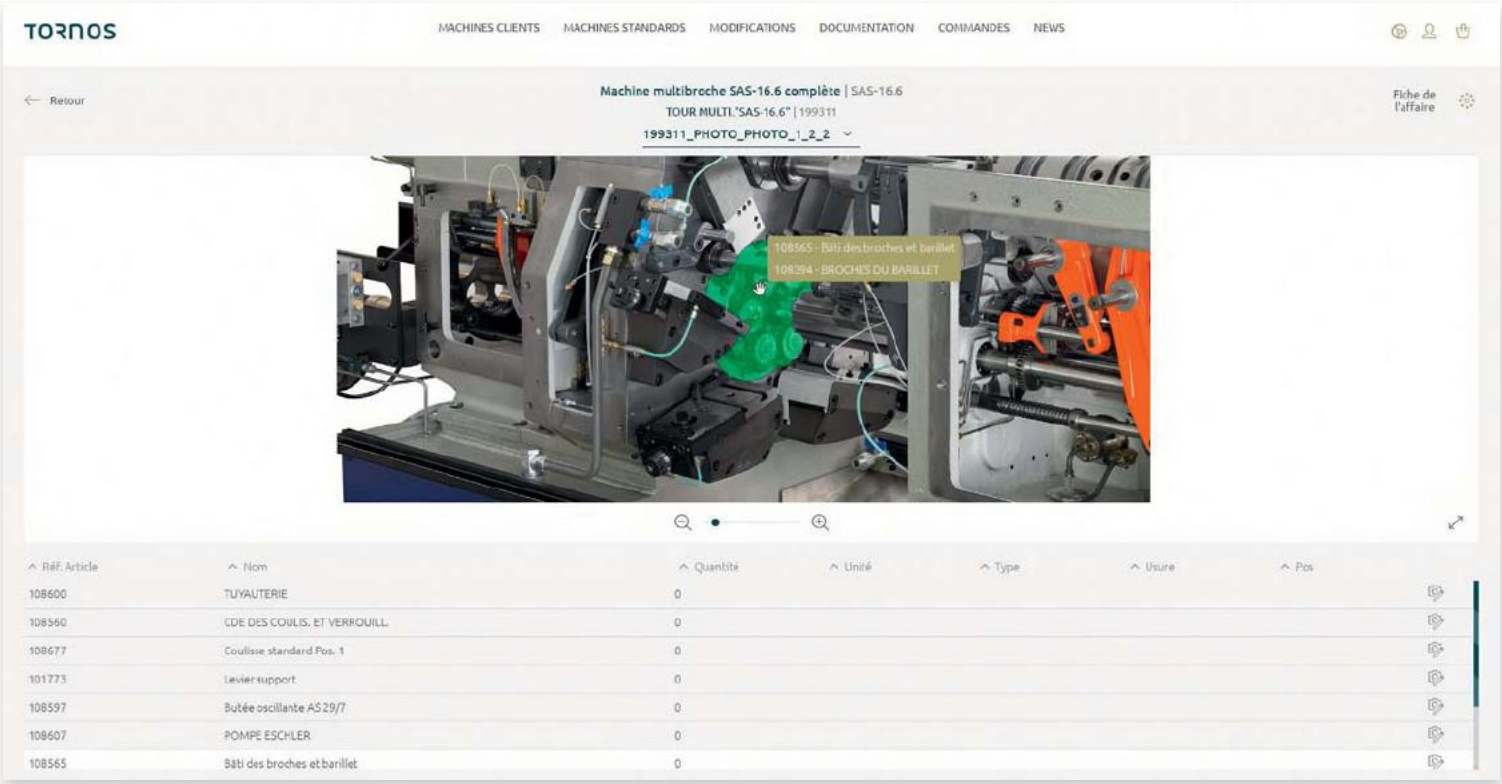
Once logged in, you access a personalized area tailored to your machine fleet. A detailed list of all the machines in your possession is available, enabling you to discover the specific spare parts for each one in just a few clicks. There's no need to wonder which part is compatible with which model—everything is already prepared.



Access the right information, at the right time

With over 20,000 parts listed and nearly 20,000 customer machines registered, the portal is a complete, tailored ecosystem. Detailed instructions for using the portal are also available in the documentation section, providing all the information you need for optimum use. Whether it's a recent model or a machine that has evolved over the years, it's possible to consult the correct version of the manual. This feature helps reduce installation and maintenance errors and maintain optimum machine performance.

The aim is to simplify access to the parts you need. That's why browsing the portal is a real pleasure: Parts can be searched by bill of materials, item number, or by filtering directly by machine type. Every new machine Tornos delivers carries a QR code, giving direct access to the online shop and making ordering even easier.



More autonomy, more savings

By opting for online ordering, immediate discounts are also offered. A 2 % discount is applied to every item ordered via the shop, rewarding autonomy and the adoption of this convenient channel. And that's not all: The portal offers direct visibility on deliverability, the famous DRC (Delivery Readiness Capability). The result: no more surprises, no more wasted time because you know right from the start whether a part is available.

Online ordering also makes it possible to structure processes within companies. For example, specific roles can be created for different team members: one person can add items to the basket, while another validates the order. For each company, an administrator can even manage the rights of each user, thus maintaining complete control over the orders placed.

A modern solution for machines of all generations

From the latest models to older machines, Tornos offers complete coverage. The Tornos philosophy is to go far beyond the legal requirement to supply parts for 10 years after sale. Even for machines sold over 30 years ago, spare parts are still available. This extends the life of the equipment and maintains optimum productivity.

Soon, the portal will go even further. New features such as e-invoice generation, detailed order history, and order status tracking will be added directly to the portal. These enhancements will provide even greater visibility of past, present and future orders.

Growing acceptance: Join the trend

Currently, between 15 and 20 % of spare parts orders are already placed via the online shop. These figures continue to grow as customers realize the many

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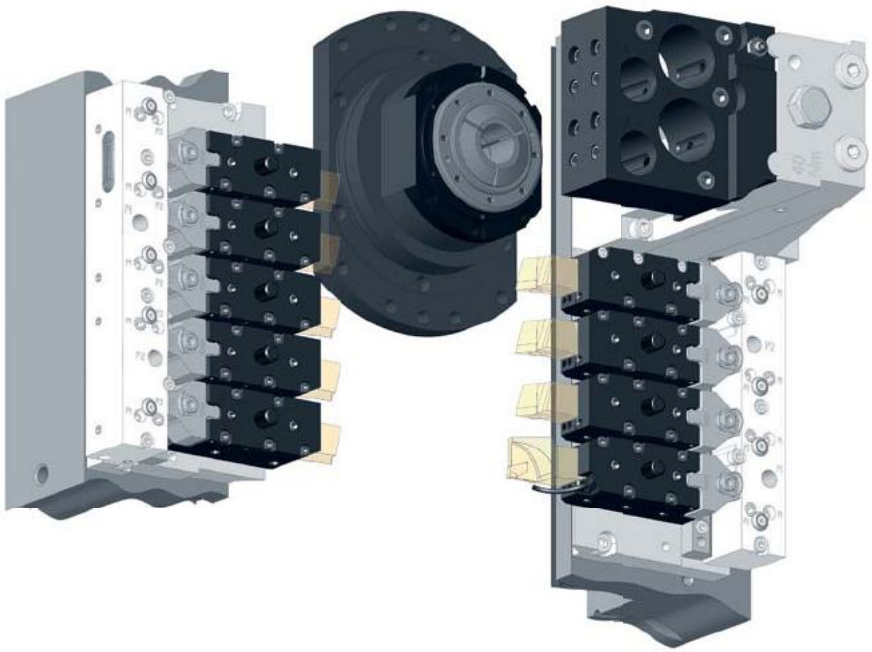

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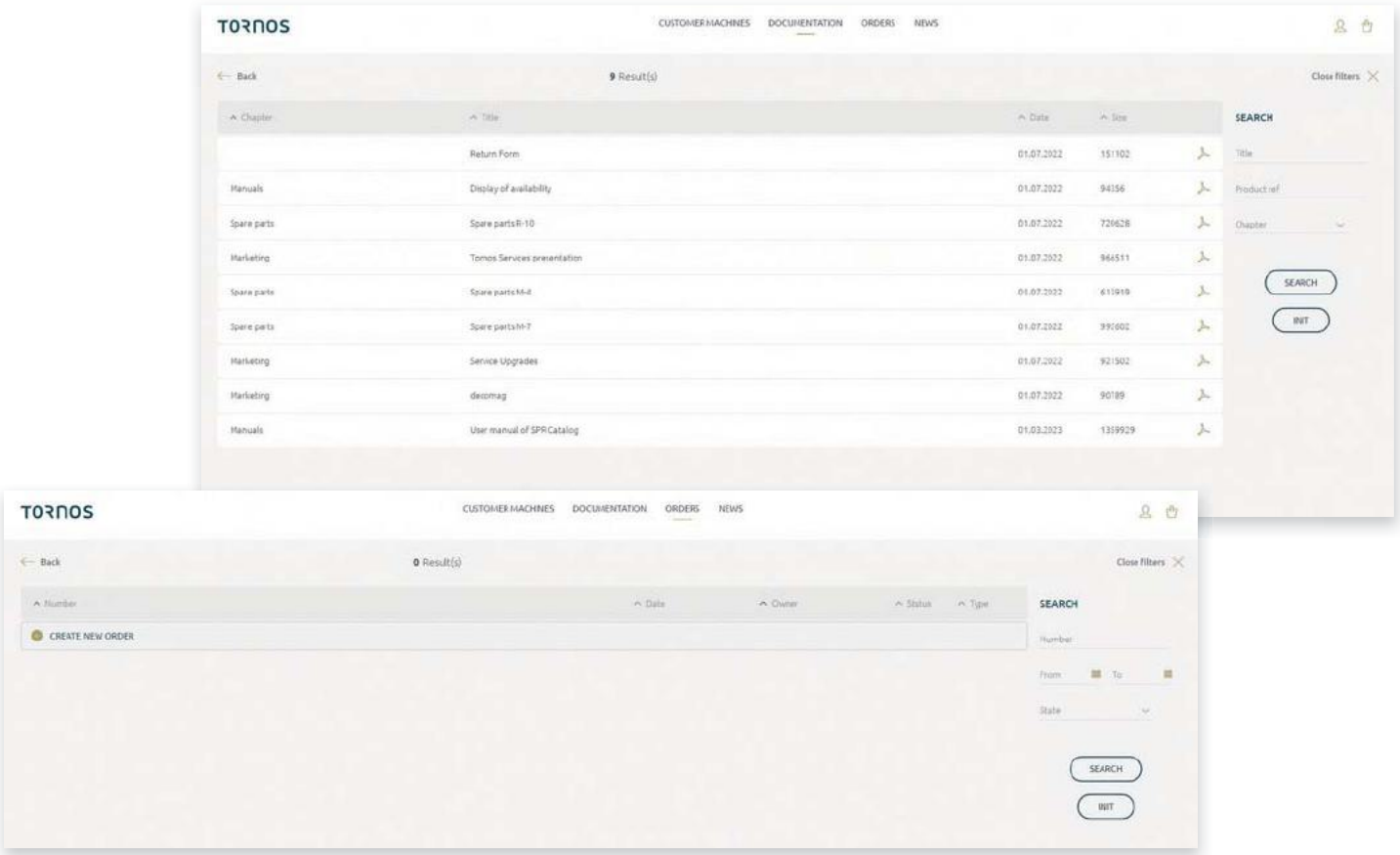

advantages of this channel: time and cost savings, autonomy, and ease of use. For those who haven't yet taken the plunge, registration is simple. To log on for the first time, simply visit the site and request a log-in. The account will then be linked to the machine fleet, for a smooth, personalized experience.

Why not try it for yourself and find out why more and more customers are adopting this modern portal? It's a way of staying ahead of the game, benefiting from rapid access to all parts, and experiencing personalized service—wherever you are, whenever you need it.

A simplified, efficient future

Machine maintenance has never been easier or more efficient. The online shop is designed to save time, cut costs and optimize fleet management. With a system that is intuitive, responsive and constantly evolving, Tornos invites you to be part of this digital revolution. Enjoy the freedom and efficiency of the Tornos portal—because every minute counts and every detail makes a difference.

To create an account now and benefit from all the advantages of the portal, go to: catalogue-spr.tornos.com/login

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The World Timer watch, with its hand-guilloché dial, showcases the artisanal craftsmanship of Voutilainen.

KARI VOUTILAINEN:

A watchmaker redefining Swiss excellence

Kari Voutilainen is not only a recognized name in the world of high-end watchmaking; he is also a symbol of Swiss excellence in craftsmanship. Born in 1962 in Rovaniemi, Lapland (Finland), this master watchmaker has become an emblematic figure in the watchmaking world, thanks to his unique creations and relentless quest for perfection. Here, he retraces his exceptional career and achievements, and highlights the importance of cutting-edge technologies, such as the SwissNano 10, within the mechanical workshop.

VOUTILAINEN
Artisan d'Horlogerie d'Art

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The beginning of a passion: from Lapland to Switzerland

In 1983, Voutilainen felt a deep desire to work with his hands and set out to find a profession that would satisfy this passion. He found it through a watchmaker friend who owned a small repair store. It was in this modest store that Voutilainen discovered watchmaking, a field that immediately attracted him. He decided to train as a watchmaker in Finland, at the Espoo School of Watchmaking, where he began to specialize in after-sales watch service.

However, his thirst for knowledge and improvement didn't stop there. Voutilainen discovered a continuing education course on clocks in England, but soon realized that this field did not fascinate him as much as watches. Eventually, he found his happiness in Neuchâtel, Switzerland, where he enrolled in the Watchmakers of Switzerland Training and Educational Program (WOSTEP), a school specializing in complex watches.

This school, with only 12 students, offered Voutilainen the opportunity to train in an exclusive environment. After completing the refresher course, he returned to Finland for a year, where he worked tirelessly to save enough money to return to WOSTEP for a course on watch complications.

The start of his career: from Parmigiani to independence

After completing his training, he chose to work for Parmigiani, thus beginning his career in earnest. From 1984 onward, Voutilainen worked on unique

“What sets him apart from other watchmakers is his commitment to direct contact with his customers.”

timepieces, such as minute repeaters and perpetual calendars. He stayed for almost 10 years and met Charles Meylan, who spotted his talent and become his mentor.

“It was he who encouraged me to make my first Tourbillon pocket watch outside working hours, at night in my apartment,” Voutilainen said.

Until 1995, Parmigiani concentrated mainly on the private label, making watches for other brands. In 1996, Parmigiani decided to launch its own brand, and Voutilainen took charge of the minute repeaters and restoration. However, in 1999, after several years of intensive work, he decided to leave Parmigiani to devote himself to part-time teaching. He soon realized that teaching, while rewarding, took up a lot of his time and did not allow him to concentrate fully on his passion for watchmaking.

In 2002, he made a decisive choice: He stopped teaching and established his own workshop, Voutilainen Horlogerie d’Art in Môtiers, Val-de-Travers, marking

The Voutilainen headquarters, perched in the iconic Chapeau de Napoléon building, overlooks the Val-de-Travers.

"Every detail is meticulously studied, and quality is at the heart of every stage of the manufacturing process."

the beginning of his independence in watchmaking. His ambition was to create his own movement. Gradually, he has added to his machine park and hired staff to assist him in his projects.

Expansion: from the Voutilainen workshop to a group of companies

In 2008, the Voutilainen workshop employed 10 people, a figure that rose to 41 by 2024. Voutilainen continues to expand his business while remaining true to his philosophy of quality and precision. Three years ago, he bought the Chapeau de Napoléon site, a former restaurant overlooking Fleurier in the Val-de-Travers. This unique building is where he assembles his watches and welcomes his customers in an exceptional setting.

Voutilainen watches: exceptional timepieces

Each timepiece created by Voutilainen and his team is unique, tailor-made to meet the specific desires of each customer. These watches are characterized by a rare combination of traditional watchmaking techniques and modern innovations, offering unrivaled quality and precision.

Aesthetics and personalization

The aesthetics of Voutilainen watches are a balance between tradition and modernity. Cases are often made of precious metals such as platinum, white gold or rose gold, and are designed to highlight the beauty of the internal movement. Dials can be customized with a variety of finishes, colors and guilloché patterns, making each watch truly unique.

Recognition and collectibility

Voutilainen watches are often seen as treasures in the watchmaking world, with a value that can increase significantly on the secondhand market. This recognition is reinforced by the numerous awards Voutilainen has received, notably at the Grand Prix d'Horlogerie de Genève (GPHG), where his creations have been hailed for their innovation and technical excellence.

Each timepiece is the result of unrivaled expertise, a passion for perfection, and a unique ability to fuse tradition and innovation. Whether through the use of advanced technologies like the SwissNano 10 or the design of unique movements and dials, Voutilainen continues to redefine what it means to create an exceptional watch.

A unique sales model

Unlike many other luxury brands, Voutilainen Horlogerie d'Art's sales structure is straightforward. Voutilainen personally participates in numerous exhibitions and acts as an ambassador for his brand. He began with the Basel trade fair SIHH (now Watches and Wonders), as well as exhibitions in Singapore and the United States, building a loyal clientele through direct, personal contact.


VOUTILAINEN

What sets him apart from other watchmakers is his commitment to direct contact with his customers. Each watch he creates is the result of a close collaboration with the customer, one in which Voutilainen translates the latter's desires and expectations into an exceptional timepiece. Every detail is meticulously studied, and quality is at the heart of every stage of the manufacturing process.

Guaranteeing excellence: Comblémine, Voutilainen & Cattin, and Brodbeck Guillochage

The pursuit of excellence is not limited to watch design, but extends to the sourcing of quality components. In 2013, faced with technical problems with a dial supplier, Voutilainen decided to take matters into his own hands. For six months, the company found itself without dials, prompting him in 2014 to buy out a bankrupt, Saint-Sulpice, Val-de-Travers-based dial company, which took the name Comblémine.

The company, initially an empty shell, has taken shape thanks to the determination of Voutilainen and his team. The same goes for the cases. After years of working with one supplier, he decided to found a new company, Voutilainen & Cattin in Saignelégier, due to a drop in quality at his previous supplier. These acquisitions gave Voutilainen complete control over the production of his cases and dials, essential for his exceptional watches.

In a spirit of development and preservation of exceptional know-how, he recently inaugurated Brodbeck Guillochage, now housed in the former Fleurier watchmaking school, built in 1896. Renovated over a year and a half in keeping with tradition, the building is now home to the group's métiers d'art. The mission of the manufacturer, under the direction of Angélique Singele, is to revolutionize the decoration of objects in a multitude of fields, far beyond watchmaking, and to shine on an international scale.

SwissNano 10 : technology at the service of craftsmanship

The acquisition of the SwissNano 10 marks a turning point in Voutilainen's approach to manufacturing. This machine, produced by Tornos, is specially designed to meet the needs of high-precision workshops such as Voutilainen's. Compact and extremely precise, it can produce components with a tolerance of one micron, essential precision for the exceptional watches created by Voutilainen.

The SwissNano 10 is distinguished by its flexibility and thermal stability, two features that enable rigorous tolerances to be maintained without human intervention, even overnight. Not only does this machine enable components to be produced in-house, it offers phenomenal productivity gains. For a craftsman like Voutilainen, the ability to control every step of the manufacturing process is crucial, and the SwissNano 10 enables him to achieve this level of control.

Kari Voutilainen and operator Nicolas Berger in front of the SwissNano 10, a key machine for the production of micrometric precision components

Before acquiring the SwissNano 10, many high-precision parts had to be manufactured manually on computer numerical control (CNC) lathes, a time-consuming task requiring considerable expertise. Thanks to the SwissNano 10, Voutilainen has been able to automate much of this process, which improves component quality and enables his team to concentrate on more complex and creative tasks.

On the strength of this success, Voutilainen plans to acquire further machining centers, probably Swiss ones, to complete his machine park and meet the growing needs of his company.

A model of independence and know-how

Today, the Voutilainen workshop produces around 70 watches a year, a figure deliberately limited to maintain a certain exclusivity. This rarity contributes to the value of Voutilainen watches, which can rise by between 150 and 400 % on the secondhand market. This strategy enables Voutilainen to maintain strict control over the market and ensure that every watch that leaves his workshop is an exceptional piece.

voutilainen.ch

Focus and meticulous attention in the workshop, where every detail matters in creating exceptional timepieces

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