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Concentrated power
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Partner of fine
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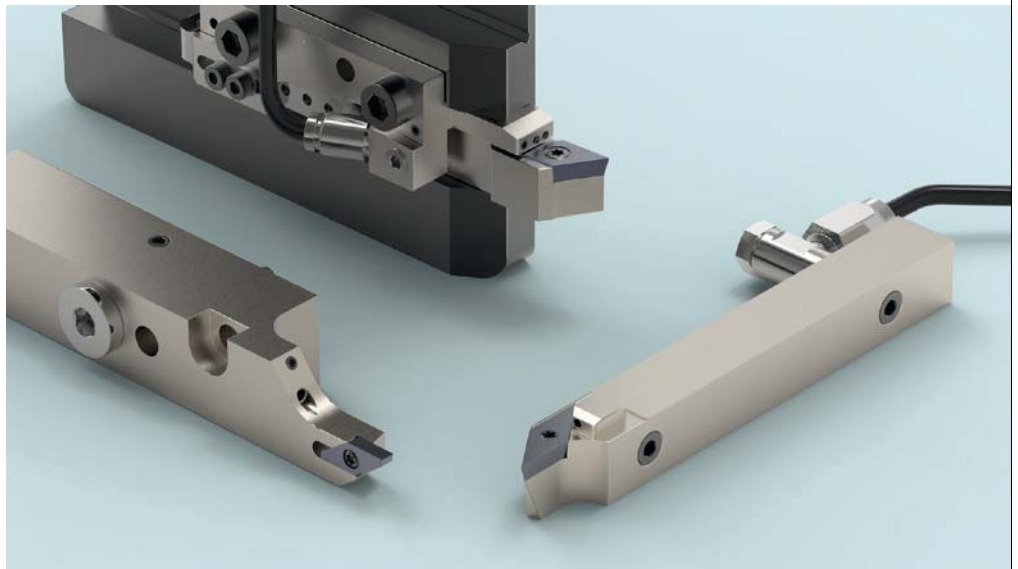
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Versatility
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“Whatever Tornos machines you are working with, TISIS will improve your efficiency.”

Patrick Neuenschwander Software R&D Manager

TISIS: Your ever-evolving portal to industry 4.0-level efficiency

Patrick Neuenschwander **Software R&D Manager**

In today's competitive global marketplace, you do not have a moment to waste in fulfilling your customers' demands. Tornos was already setting the course for your highly productive manufacturing future — Industry 4.0 — four years ago when we launched our TISIS ISO editor. Today, more than **1,000 TISIS packs are installed worldwide**, and the software is continuously evolving to help your business leverage the efficiency-boosting potential of the Internet of Things.

Future-shaping software

With our future-shaping and scalable TISIS communication and monitoring software, you save valuable programming time and experience real-time process monitoring. In the process, you reduce your risk of programming errors and significantly shorten your setup time while avoiding collision-related downtime. Whatever Tornos machines you're using, TISIS has you covered.

While TISIS was conceived to streamline and shorten the machine setup process, it delivers additional compelling advantages: It knows your entire Tornos machine fleet, can help you decide which machine to use to produce a specific part. TISIS helps you write your code, and it points out coding errors. It puts the code in color and displays it in an attractive, easy-to-read Gantt diagram, so that you can easily identify — and optimize — the critical path.

A secure knowledge repository

At the same time, TISIS functions as a central repository for your programming know-how. Operations generated by your experienced bar turners are conveniently and securely stored in a library so that they can be repeatedly and correctly reused by your less experienced staff.

We know that efficiency must be measurable in order to be meaningful. That's why we developed TISIS to allow you to actually measure your workshop efficiency. With TISIS, you can more easily program highly complex parts, view their status in your workshop, see each machine's performance details, and receive notifications in the event of problems — anytime, wherever you are in the world.

TISIS: evolving with your needs

Your real-world manufacturing experiences are factored into our continuing development of TISIS. In fact, based on your insights, we continue to add new capabilities, like TISIS live, a new module allowing our expert service engineers to analyze the status of any connected Tornos machine in the world. With TISIS live, our service engineers — with your authorization — can securely monitor changes in the machine state, alarms, and other significant data specific to your Tornos machines.

As a provider of customer-centric solutions, we invite you to connect with us about how TISIS can evolve to better serve you. Whether you have an idea for a new functionality or a way to improve TISIS' current functionality, reach out to us at tisis-feedback@tornos.com and do not hesitate to test our software. You can download a 30-day trial version at store.tornos.com. We look forward to hearing from you!





Depending on the workpieces to be machined, the productivity with MultiSwiss machines is five or even eight times higher compared to single-spindle machines.

MULTISWISS:

Concentrated power and precision

Tornos recently launched the two MultiSwiss 6x32 and MultiSwiss 8x26 machines. Both machines utilise the same machine base. Despite their similar construction, however, some features of these machines are fundamentally different. It is these differences that makes both machine tools such unique machining solutions.

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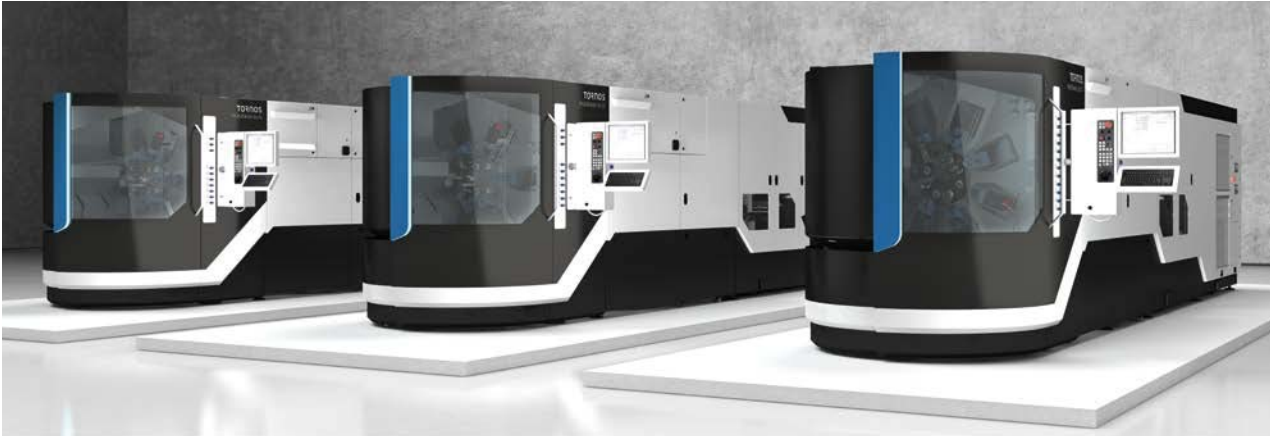
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Meeting the requirements of a challenging market

It's becoming more and more difficult to forecast the market evolution. The deadlines are decreasing, the margins are declining and the workpiece complexity is increasing. To reduce the unit costs, there is only one solution. You have to find a production means that enables the desired quantity of parts to be manufactured at a better price. Quite large volumes have often to be manufactured within very short deadlines and with impeccable quality.

Different ranges to be able to meet any demands

With its comprehensive range of extremely flexible single-spindle products, Tornos is able to offer an efficient solution for almost any market requirement. However, to quickly respond to a high demand, the number of set-ups and the number of machines would have to be increased and this is exactly where the range of MultiSwiss range comes into play. Thanks to their ergonomic features and their ease of use, the MultiSwiss machines can be set up as fast as a Swiss-type lathe or even faster in certain



cases. Depending on the parts to be produced, the productivity can be increased by five or sometimes even by eight times. The hydrostatic bearings enable excellent surface finishes to be achieved on the parts in question.

Of course, any advanced multi-spindle lathe can produce highly demanding workpieces today. However, you can go even further with MultiSwiss since it is able to expedite the industrial process on the whole while providing the capability to machine complex workpieces with higher quality on a single machine.

The same machine base down to every detail

The two machines were conceived at the same time within the scope of one and the same project. The machine base is exactly the same and both machines are equipped with the same container comprising all the peripheral units that are required for correct machine operation. The attachments used are the same as well, except some adjustments that differ depending on whether the machine is equipped with eight or six spindles. The two machines have the same enclosure and the same cast components, only the barrel and the number of available slides are different. Output and torque of the spindles are also different for each machine. This is to tackle machining tasks with respect to specific machining diameters.

A power pack second to none

The MultiSwiss 6x32 machine benefits from six motor spindles integrated in the barrel, all of them being equipped with hydrostatic bearings. This technology is essential. It guarantees unique damping charac-

teristics that allow a reduction of tool wear by more than 30% and an improvement of the surface finish of the machined workpieces compared to a conventional multi-spindle machine or a Swiss-type lathe. With this technology, the world of multi-spindle turning is made accessible to single-spindle lathe users. In fact, the major difference between the two technologies is in the control of chip formation and tool wear which both are caused by productivity increase. Just like the MultiSwiss 6x16 and MultiSwiss 8x26 machines, the MultiSwiss 6x32 benefits from the same well-proven tool holders with integrated coolant supply and the same fully accessible machining area that enables optimum chip removal.

Six spindles: a shortcoming?

Even if the MultiSwiss 6x32 machine has only six spindles and therefore six slides, it is a machining solution suitable for producing complex parts. "Sometimes, customers tell us that they prefer an eight-spindle machine because on a six-spindle machine, only four machining positions remain once having subtracted the cut-off and bar feeding positions. This is both true and false. Our MultiSwiss machines are equipped with intelligent tools and can carry out machining operations at the cut-off and bar feeding positions. A maximum of 4 tools can be mounted on each slide even if it is needless to say that an eight-spindle lathe has two additional positions. Even so, the differences in terms of capability are less than one might think while there is a significant difference between the prices of the two products. Each of the two machines has its own market," Rocco Martoccia, Tornos' Product Manager responsible for multi-spindle projects, explains.

A highly flexible machine

The MultiSwiss 8x26 and MultiSwiss 6x32 machines are extremely flexible. Similar to a Swiss-type lathe, they allow fast set-up in case another series shall be produced. Nevertheless, as machines being capable of large-scale production, they remain true to their heritage. A look at the technical specifications of the machine will provide evidence for this. For example the 200-liter oil tank, the continuous paper filter system and especially the optional stacker being able to accommodate 2 tons of material. These attributes make these machines reliable machining solutions the customers can rely on.



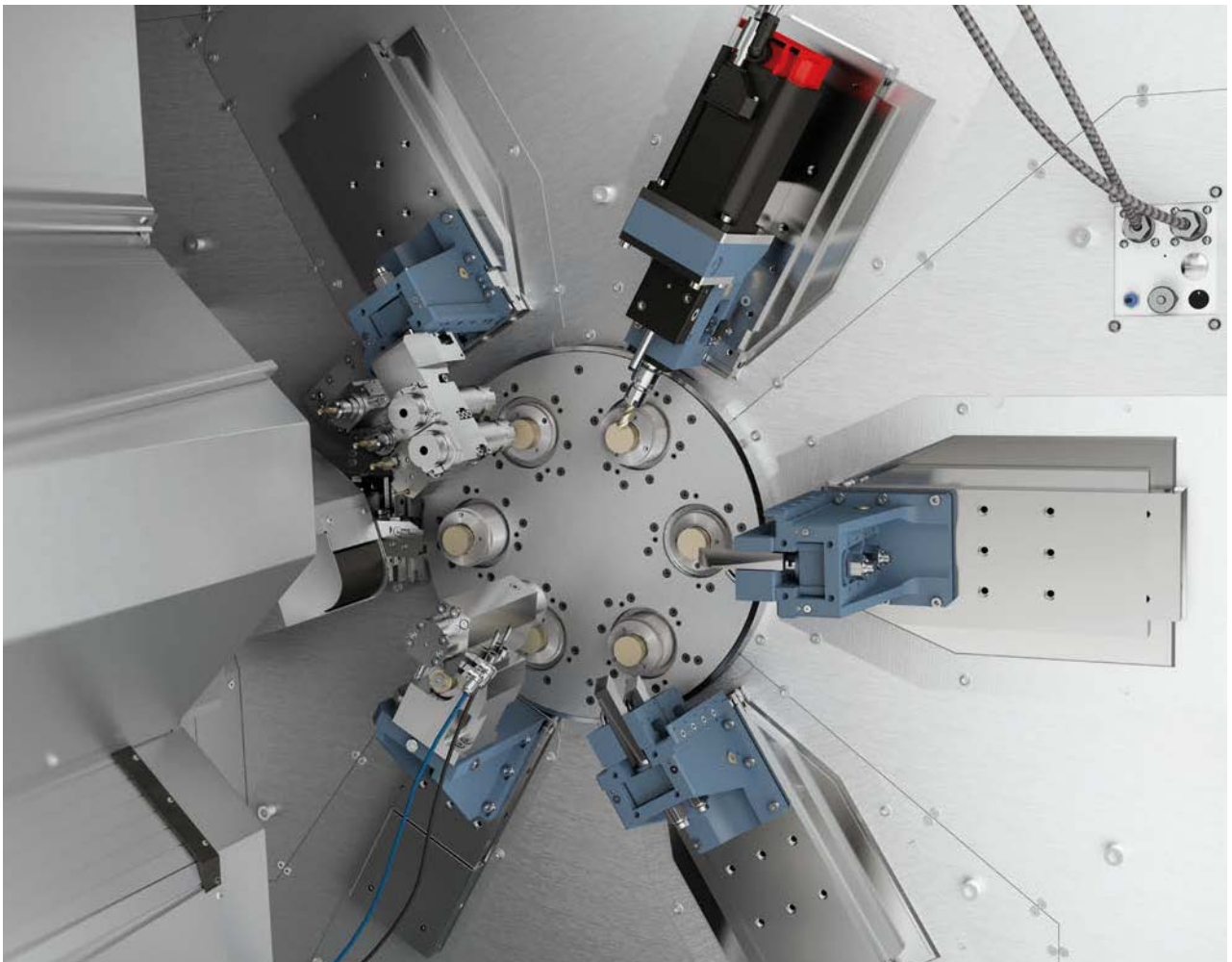
Visit the Tornos YouTube channel to discover the MultiSwiss range.
https://youtu.be/4Dkm_bKATPo

On the specific website www.multi.swiss, you will find further exhaustive information.



Moreover, the Tornos staff will be pleased to present to you the machine by appointment at the company's headquarters in Moutier or at its subsidiaries. Do not hesitate to contact them!

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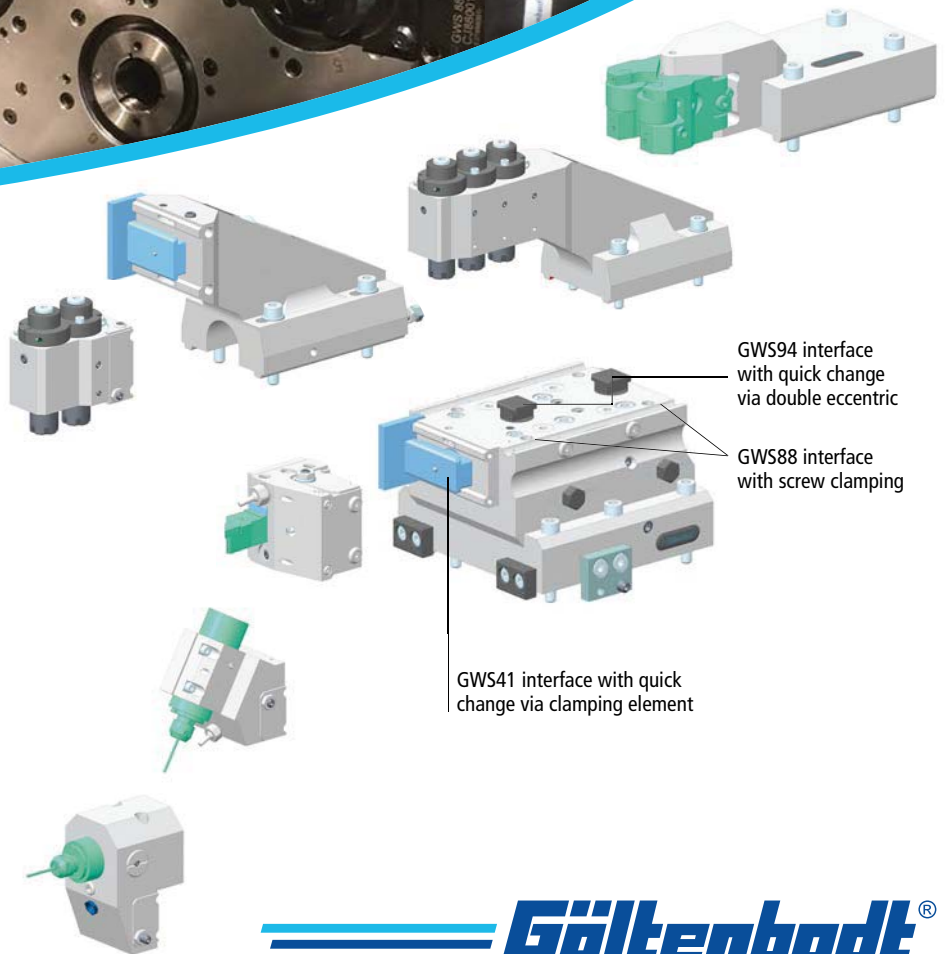
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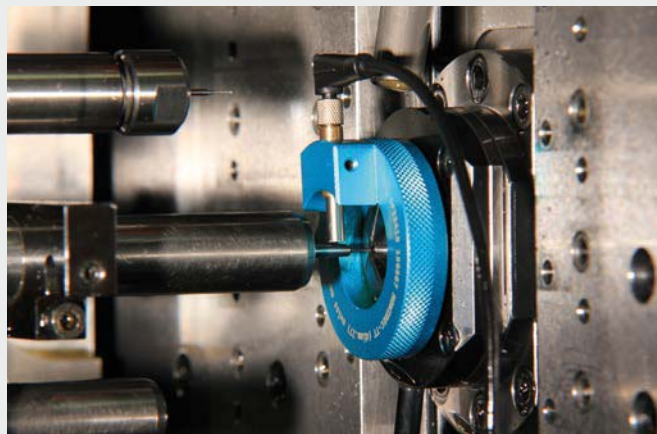
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ALMAC BA 1008 +:

A small machining center with large capacity

Almac is well-known for finely matching its machines with the specific customer requirements. It is therefore not surprising that, over time and based on increasing demands, the small bar-type machining center BA 1008 has been equipped with more and more options, peripherals and other special attachments.

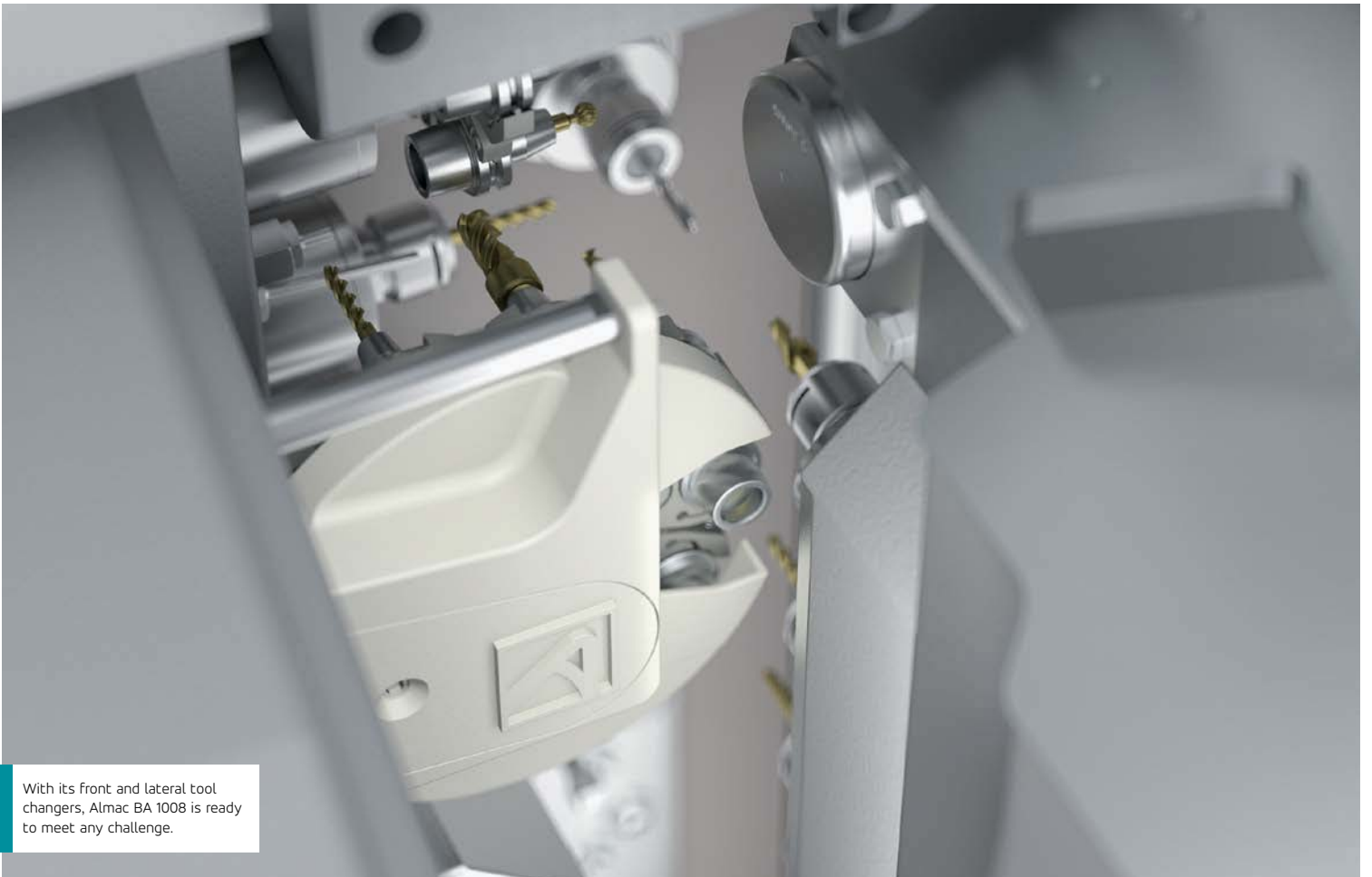
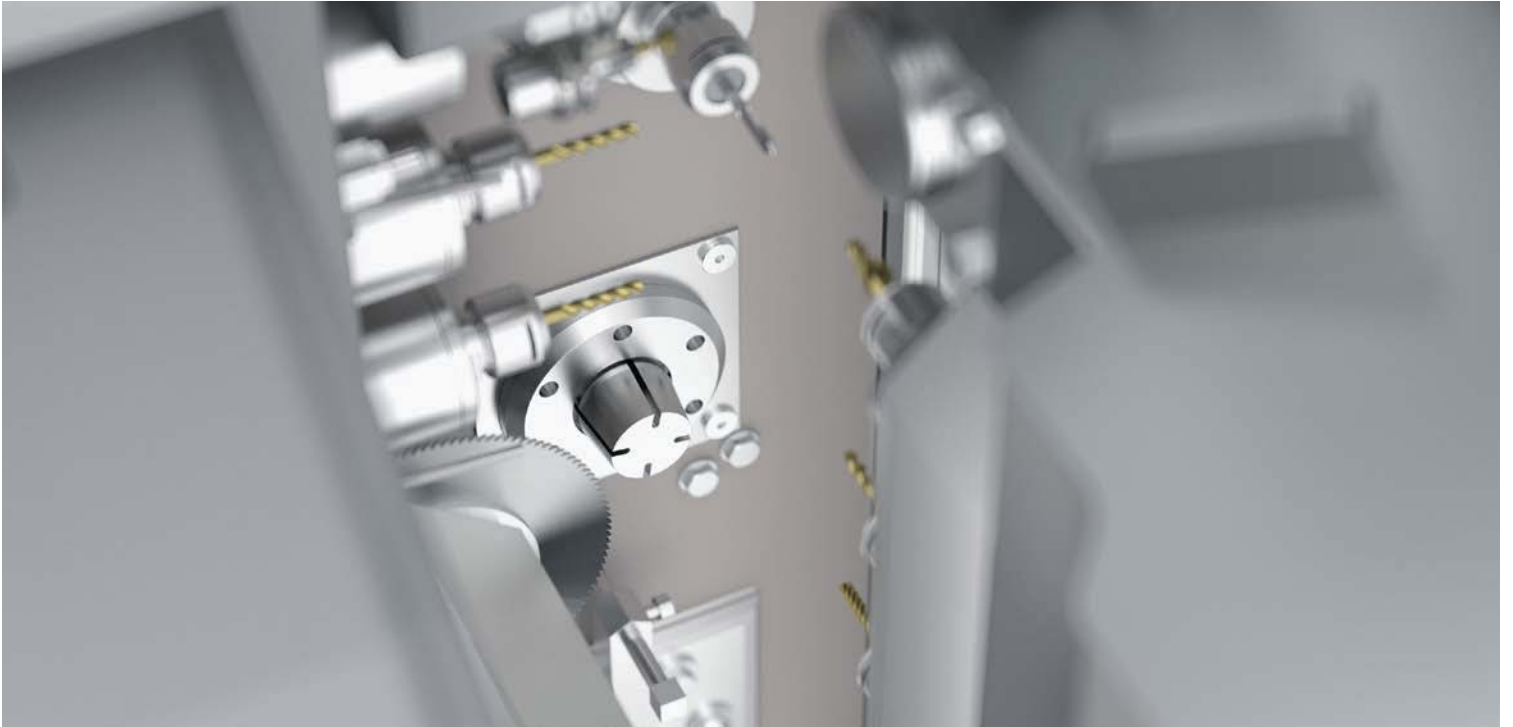


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info@almac.ch

Now, we would like to present to you two further new options – and not the least important ones. We are talking about a tool changer or, more specifically, two tool changers.

A simple machine with optimum accessibility

The basic concept of the BA 1008 was rather simple. The aim was to design a compact high-performance milling machine. The machine soon aroused interest in various industries, not only in watchmaking but also in numerous other fields such the connection and electronics business, eyewear manufacturing or medical industry. Over time and depending on the particular customer requirements, the machine has been successfully adapted to all types of demands. Therefore, it can be equipped e.g. with various spindle types according to the machining process to be carried out. Other features include a B axis on the front spindle block and a full enclosure for precious metals that is especially designed to recover 99% of the chips in 20 minutes. The BA 1008 variant equipped with a high-pressure coolant system whilst the Almac BA 1008 + boasts through-the-spindle coolant supply with a continuous pressure of 120 bar that allows very high drilling speeds.



With its front and lateral tool changers, Almac BA 1008 is ready to meet any challenge.

Two new tool changers

Today, two new options are presented: a 10-position tool changer for the front spindle block and a 6-position tool holder for the lateral spindle block. This means the BA 1008 and BA 1008+ can now be equipped with thirteen additional tools and their tool capacity is significantly expanded to 22 tools on the whole. The maximum tool configuration now comprises eight tools in the lateral spindle block, twelve tools in the front block and two tools for back machining operations.

The already advanced system is thus enhanced and the machine performance is increased. With these two new options, the Almac BA 1008 is able to manufacture workpieces that were previously inaccessible or could only be machined using expensive shaping tools that were rather inconvenient particularly due to their procurement lead times. The two tool changers also enable sister tools to be used in case of machining operations that involve considerable tool wear. The autonomy of the machine can thus be increased significantly.

The compact design of these tool holders has the advantage that the machine can be equipped with a B axis at any time. In addition, the tool changer design has been optimised to guarantee perfect chip flow in the machining area. On a machine that is provided with the full enclosure that has been especially designed for the machining of precious metals, the chips are recovered with high reliability.

A presentation in Hanover that makes the customers' hearts beat faster

The 6-position tool changer for front spindles was exclusively presented at EMO 2017 in Hanover and caused quite a stir. Being able to significantly enhance the machining possibilities, it immediately aroused keen interest among the users. Philippe Dévanthery, Managing Director at Almac SA in La Chaux-de-Fonds comments: "The technical challenge of offering these two tool changers for such a compact machine as the BA 1008 could only be met thanks to our R&D department and its engineers who are doing their utmost to push the envelope with this bar-type milling machine." He adds: "We want to establish our BA 1008 in new markets to fully utilize its potential. Thanks to the large array of machine options, we are able to offer an unrivalled machining solution. Of course, there are similar machines in the market. For those parts, that can be produced on the BA 1008, we know we are highly competitive."

You are invited to discover BA 1008+. For detailed information, please contact your nearest Tornos representation.

almac.ch





The new CT 20 features the highly appreciated characteristics of the previous model while providing additional capabilities, in particular the equipment with more tools and the operation without guide bush.

THE NEW TORNOS CT 20:

A most welcome advancement!

In 2012, Tornos launched its Swiss-type lathe, the CT 20. Now, the company presents a new version.

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Featuring 5 linear axes and a bar capacity of 20 mm, this simple yet powerful and sturdy machine has found its way into Tornos' product range. Thanks to its competitive price, the machine has made the Tornos universe available to anyone looking for a reliable and easy-to-use machine.

Comprehensive equipment on a solid base

Even if this machine is considered to be the entry-level machine of the Swiss manufacturer's product range, it is a comprehensive high-performance machining solution, just like every other Tornos product. The machine is offered with a large number of accessories, most of them already included in the standard machine. By default, the machine is equipped with a motorized guide bush, two C-axes, various tool holders that enable immediate operation, a conveyor belt and even a 20-bar pump. The standard machine equipment also includes a central cyclical lubrication system.

With its kinematic system, the machine is able to meet the numerous market requirements. The machine has a cast frame providing the machine with excellent rigidity and boasts perfect thermal behavior. It can be programmed with the Tornos TISIS programming software and this ensures even higher ease of use and intuitive operation.

Lots of similar machines are offered in the market, however, the CT 20 not only features comprehensive equipment but provides high-performance features



that are unique in this category. Optionally, the machine can be equipped with two driven tools next to the counter-spindle for front machining operations such as drilling and milling. Just like with any Tornos machine, the tooling zone is modular. In fact, attachments such as a thread whirling unit or a polygon milling unit may be installed for main machining operations. For back machining tasks, a drilling or slotting unit can be installed. These options are managed through the TISIS software and make the machine suitable for operations with a high added value, despite its apparent simplicity. For the CT 20 machines, a whole lot of optional equipment is available and this includes a part collector for long parts, a chip conveyor and last but not least, various bar feeders.

A new version for even more capabilities

Tornos is committed to constant enhancement of its products to best meet the market requirements and trends. And the CT 20 is no exception! To make it even more attractive, a new version will soon be launched. The machine will boast the same basic characteristics that have proved to be successful with the first version – and it will be offered at the same attractive price. The basic features will be supplemented by a spindle block for back machining operations provided with 5 tool positions instead of 4 (in the previous version). The machining capabilities will thus be increased. So the machine will be able to be equipped with 27 tools including 11 driven tools. On this machine the tooling zone will also be modular and the installation of special tool holders will be possible. As another new feature, the machine will also be able to operate without guide bush, after a conversion that will take just about 30 minutes.

As on the Swiss DT and Swiss GT machines, it is very easy to change over to the operation without guide bush. In particular, this is due to Tornos' human-machine interface – TMI. This greatly facilitates the management of these types of operation. Spindle and counter-spindle will now be able to rotate at 10,000rpm.

Ready for industry 4.0 thanks to TISIS

The CT 20 can also be equipped with the Connectivity Pack that will enable the machine to communicate in both directions within a factory network. It will be possible to permanently monitor the production status of the machine, the alarms, the parts library that may contain illustrations or even operation plans as well as the temperature and the load of each axis. All this allows the operator to remotely monitor the machine using a Smartphone. Furthermore, with thanks to push notifications, the operator is immediately informed about the slightest production problem.

CT 20 – an attractive package you should discover now

The CT 20 machine is a turnkey high-performance machining solution (including bar feeder) offered at a most attractive price. If you want to get more details on this machine, please contact your nearest Tornos representative. For detailed information on the various options, please visit our website www.tornos.com where you can download the Machine Options brochure.

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The new ACB macro enables the chip breaking process to be improved in a most simple and efficient manner.

ACB:

Active Chip Breaker

Recently Tornos introduced the ACB or Active Chip Breaker system. This new machining technology enables better chip processing during the machining process.

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With this new software function, an interruption of the cutting process can be programmed to enable chip breaking. This option enables the user to program and manage operations that generate long or stringy swarf with ease.

A machining macro...

The Tornos Active Chip Breaker (ACB) system uses a new cutting technology that is both universal and highly effective. It enables virtually all part geometries to be machined from the most varied types of materials. Chips are broken in a controlled manner and this eliminates machine downtime caused by the accumulation of chips. The macro is easy to use for linear movements and can be configured depending on the requirements of the part to be machined.

... to solve any problems linked to chip formation

This innovation solves all problems linked to chips wrapping around the tools while enabling highest levels of precision. This system offers immediate control of the formation of chips in any type of material,



With active chip breaker



Without active chip breaker

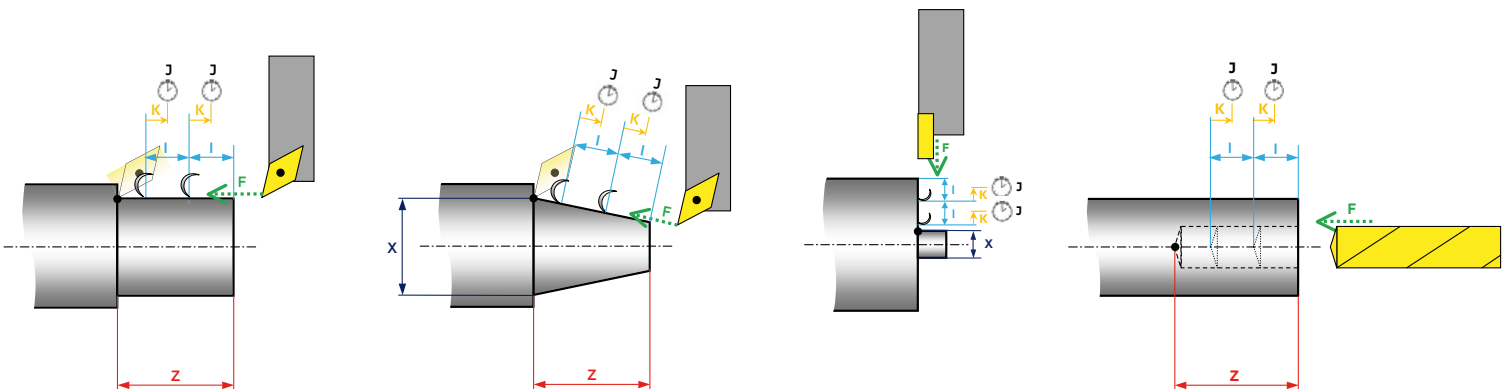
including materials that are difficult to machine such as Inconel®, cobalt-chrome, non-ferrous materials, plastics, stainless steels, titanium and titanium alloys. The ACB system is easy to use and can be activated both for the main spindle and the counter spindle. In addition, it can be used both for turning and drilling operations. The ACB provides effective support for devices such as high-pressure pumps and can even replace them in some cases. The main advantage of the ACB system is its quick implementation. However, there are many more benefits.

Your benefits:

- Improved process safety, reduced risk of fire
- Reduced machine downtime
- Increased tool life
- Reduced machine maintenance time
- Improved chip removal
- Enhanced swarf management
- Easy and quick implementation, allowing increased productivity
- Easy activation of the option through a machine software update
- Reduced energy consumption
- Attractive price

1.1 G965 [Chip breaking]

Cmd	Description	Unit	Optional	By default
F	Feed rate	[mm/rev] [inch/rev] [mm/min] [inch/min]	Yes	Last feed rate
I	Increment before chip breaking	[mm] [inch]	No	-
J	Downtime for chip breaking	[Seconds]	Yes	0
K	Retraction for chip breaking	[mm] [inch]	Yes	0.1
X	End-of-segment position in X axis	[mm] [inch]	Yes	-
Y	End-of-segment position in Y axis	[mm] [inch]	Yes	-
Z	End-of-segment position in Z axis	[mm] [inch]	Yes	-





Chips with ACB



Chips without ACB

Details:

Feed rate [F code]:

This command defines the feed rate with which the tool advances into the material.

The valid unit is mm/min or mm/rev, depending on the mode "G94/G95" programmed last.

This command is optional and the feed rate last programmed is used by default.

Increment before chip breaking [I command]:

This command defines the distance to be travelled before chip breaking.

This command is mandatory.

Downtime for chip breaking [J command]:

This command defines the downtime, i.e. the period without axis movement that is required for chip breaking.

This command is optional; it is set to 0 seconds by default.

Amount of axis retraction for chip breaking

[K command]:

The tool can be configured to retract slightly in order to allow chip breaking.

If this command is omitted, a default value of 0.1 mm is used.

End-of-segment position in X axis [X command]:

This command defines the end-of-segment position in the X axis.

This command is optional; if it is omitted, there will be no X-axis movement.

End-of-segment position in Y axis [Y command]:

This command defines the end-of-segment position in the Y axis.

This command is optional; if it is omitted, there will be no Y-axis movement.

End-of-segment position in Z axis [Z command]:

This command defines the end-of-segment position in the Z axis.

This command is optional; if it is omitted, there will be no Z-axis movement.

The Tornos chip breaking cycle is now optionally available for all Tornos Swiss-type machines.

Sample programming

```
G965 X12 Z-18 I1 J0.002 K0 F0.08
```

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**HAROLD
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The EMO provided an opportunity for Tornos to reaffirm their commitment to permanent innovation at the service of their customers.

EMO 2017:

A great success for Tornos

At this year's EMO, that closed on September 23rd, 2017, the key theme was Industry 4.0, robotics and automation.

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This major exhibition in Hanover brought together almost 2200 exhibitors from the machine-tool industry and served them as a forum to showcase and demonstrate their products and innovations. Tornos used the EMO to give its world debut to the SwissDeco36 and its Robot Cell i4.0. We would like to invite you to discover or re-discover these innovative solutions.

Swiss-type range: unveiling of SwissDeco 36

The SwissDeco 36 machine inspired a great many of visitors at EMO. Brice Renggli, Market Intelligence Manager, summarizes the machine highlights as follows: "ultra-rigid, ultra-powerful, ultra ergonomic, ultra-efficient! This machine unites a variety of superlatives." SwissDeco has been conceived as an integrated machining solution. To be able to fully utilize the capabilities of the machine's kinematic system, spindles and specific structure, it was important to equip it with the full range of appropriate peripherals. Just like on the MultiSwiss machines, the peripherals are housed in a common container that has been specifically designed for and matched with SwissDeco.

A whole range of efficient machining solutions, for large...

At the EMO, the visitors also had the opportunity to discover continuous 5-axis machining by means of a live cutting demonstration of a dental implant that

“Ultra-rigid, ultra-powerful, ultra ergonomic, ultra-efficient! This machine unites a variety of superlatives”



was machined on the Swiss GT 32B. Thanks to the B axis, mechanical adjustments are no longer required for this type of workpieces. Visitors could also admire the Swiss DT 26, an entry-level machine with modular tooling zone that enables the machine to be easily adapted to the specific workpiece requirements to be machined. The configurations possible with this machine are almost infinite.

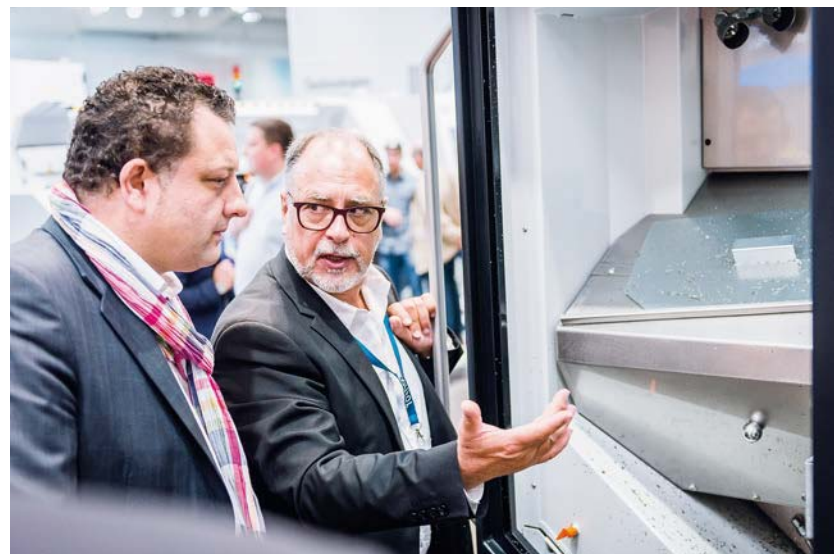
... down to small diameters

As machines at the other end of the range in terms of bar diameter, Tornos showcased its SwissNano and EvoDeco 10 models. These two machines are known and recognized for their ability to machine small and even the smallest parts with maximum quality. They are ultra-flexible and can be equipped with various attachments such as a gear hobbing unit. Their precision and stability are major assets.



For the first time: A get-together of the whole MultiSwiss family

MultiSwiss 8x26, MultiSwiss 6x32 and the MultiSwiss 6x16 delivered a shining performance during cutting demonstrations. MultiSwiss 6x16 was at the center of a presentation in which its machining precision was directly demonstrated using a measuring system. This showed excellent dimensional accuracy results. The larger models stood out due to their ergonomic features and therefore the whole MultiSwiss range attracted considerable attention.





Starring: a robot

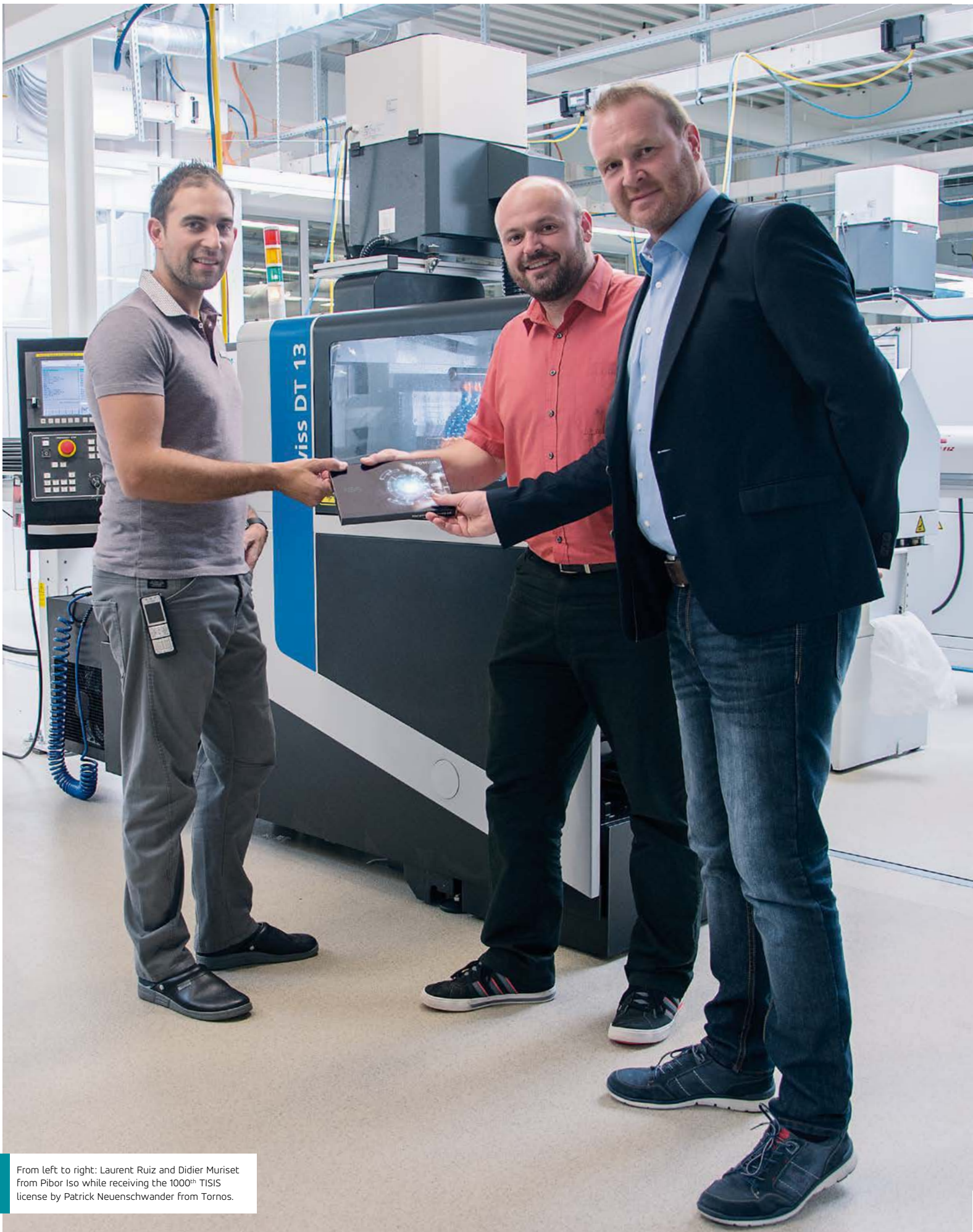
Just this once, Tornos presented a robot cell on its booth. The so-called Robot Cell i4.0 may be defined as an automated production cell. It has been designed to enhance productivity, quality and production autonomy. The Robot Cell i4.0 is a unique solution for cleaning, measurement, in-process compensation and storage of the parts that meet the quality specifications. It is able to perform these tasks for four lots of different workpieces.

Almac – permanent evolution

This year, Almac presented two fundamentally re-designed versions of the Almac CU 2007 and Almac BA 1008 machines. The BA 1008 is now available with two tool changers for front lateral tool loading, which is intended to enhance the machine capacity. Needless to say, the machine boasts its well-proven basic characteristics. As for the CU 2007 machine, it is equipped with a short-bar loader operated via an automation module. The milling machine is thus transformed into a veritable 5-axis turning/milling center. The machine simply offers a cost/performance ratio that is second to none in today's market.

For further information about the above-mentioned innovations, please contact your Tornos dealer.

tornos.com



From left to right: Laurent Ruiz and Didier Muriset from Pibor Iso while receiving the 1000th TISIS license by Patrick Neuschwander from Tornos.

PIBOR ISO –

partner of fine

watchmaking –

relies on Tornos

The company Pibor Iso SA is headquartered in Glovelier in the Swiss Jura Mountains. This highly specialized manufacturer produces crowns and push-pieces as well as other watch components.



Pibor Iso SA
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www.pibor.ch

Working for the most renowned luxury-watch and jewellery manufacturers, Pibor Iso SA feels obliged to supply its customers with parts of impeccable quality. In order to be able to satisfy such demanding customers, it's no surprise that Pibor chose Tornos for the bar turning processes. Just recently, the company invested in a Swiss DT 13 machine and, it is the Tornos customer that acquired the 1000th TISIS license. We met Mr. Didier Muriset, Industrial Manager, and Mr. Laurent Ruiz, Micro-turning Division Manager at Pibor, as well as Patrick Neuenschwander, Tornos' Software R&D Manager.

A matter of proximity and Swiss-made technology

A few years ago, the company opted for Tornos machine tools, first of all for reasons of proximity but also because the managers were looking for Swiss-made machines. This made Tornos the logical choice. In total, Pibor is using more than 70 automatic lathes for its production, all of them designed for diameters between 1 and 16 mm. Didier Muriset, Pibor's Industrial Manager explains: "The close proximity

“This software proves the most welcome support at all levels. It is extremely easy to cope with and constitutes a precious help for machine programming and set-up”

to the Tornos headquarters offers numerous advantages to us: service works are carried out promptly, we have very good contacts within the company and we benefit from excellent support. That’s why we collaborate with Tornos. And, what’s more, we are deeply satisfied with their machines. We possess relatively new machines – the average age of our machines is under five years. We have all types of Tornos machines: Deco 10, Deco 13, EvoDeco 10, EvoDeco 16, Micro 7, Micro 8, Delta 12 and Delta 20, SwissNano and as of late, one Swiss DT 13.”

One of the global leaders in the watch decoration sector

Pibor regards the customer requirements as a possibility to technically advance day by day. “This is a key element of our company’s philosophy,” Mr. Muriset emphasizes. The company is focusing on one single production site in Switzerland with 120 employees and it relies on full vertical integration. The company has more than forty established activities, each of them dedicated to the design and manufacture of crowns, push-pieces, complex-shape parts and other applications processes. Production is 100% Swiss-made and Pibor is establishing itself as one of the

Laurent Ruiz, Micro-turning Division Manager, and Didier Muriset, Industrial Manager at Pibor Iso, in front of one of their SwissNanos.





world leaders in the development and production of decorative parts for watch cases that are produced from all types of material.

Pibor processes any type of metals and precious metals as well as titanium carbide. Incidentally, the company has RJC/CoC certification and it is a member of the RJC initiative (RJC = Responsible Jewellery Council). The company is obliged to obtain the RJC certification within two years following its admission and undertakes to implement and promote responsible business practices as regards ethics, environment and working conditions. This RJC certification is complemented by another certification, the certification according to the CoC standard. The CoC standard guarantees responsible and conflict-free sourcing throughout the supply chain on the basis of an established surveillance of the certified entities. The purpose of this certification is to confirm good business practices among companies involved in the supply chain of gold and diamonds – from the mine through to distribution.

Exceptional know-how...

More than sixty years of research, studies and development provide the Pibor engineers with the knowledge and know-how required to support the watch designers and watchmakers in the realization of projects that set fashions and trends. Pibor's expertise is not limited to bar turning; the company also boasts very impressive milling, polishing, stamping and reworking skills. Pibor has positioned itself as a small manufacturer. Proving its full vertical integration, the company produces its own tools.

... at the service of the customers

Pibor's technical office and its R&D department are available to the customers to jointly tackle the challenges posed by certain workpieces. Being ultra-flexible and responsive, the company is able to deliver prototypes in less than 3 weeks. Pibor has established itself as a supplier of highly specialized solutions being able to relieve its customers from complex machining tasks.



Deco and EvoDeco: flexibility of use

The Industrial Manager talks about his machines: "Our machine inventory mainly consists of Tornos Deco and EvoDeco machines. We highly appreciate these machines as they provide us with great possibilities, especially for machining complex workpieces. They perfectly match our requirements and boast a high ease of set-up, a freely accessible machining area and convenient ergonomic features. Furthermore, there is a very long list of available auxiliary equipment and it is most easy to customize the machine to meet our specific needs. In addition, most of our machines are equipped with several high-frequency spindles. It should be noted that machining crowns is a complex task. Some crowns comprise more than 25 components and the Deco and EvoDeco machines are really flexible machining solutions that enable us to meet even the most complex demands of our customers."

SwissNano: for small components

SwissNano machines were recently purchased to complement the existing Deco and EvoDeco machines in the Pibor workshop. By way of this

precise machine with high thermal stability, Pibor introduced the TISIS software. The company has already purchased seven SwissNano machines and all of them are working to Pibor's full satisfaction. "The machine is easy to set-up and use. We are even using it for the production of less complex parts than the EvoDeco and Deco machines. The SwissNano certainly has its merits. It can be equipped with a polygon cutting attachment for specific machining requirements. Furthermore, almost no training is required as the TMI interface ensures intuitive operation while the TISIS software offers optimum accessibility. Operators of Swiss-type machines used to work with ISO control features will get along quickly with the machine," Mr. Ruiz emphasizes.

Swiss DT 13: a simple machine for simple workpieces

Pibor had been looking for a machine to replace the Delta 12 machines. They wanted to find a simple, yet efficient machine for lower value-added parts. The Swiss DT 13 can be programmed with the TISIS software and this proves to be advantageous since the company already has a whole fleet of SwissNano machines working with this software. The Swiss DT 13 appealed to them thanks to its simple, yet effective kinematics that allows very short chip-to-chip times. "It is a worthy successor for the Delta range," Mr. Muriset underlines.

The 1000th TISIS license

With the DT 13, Pibor is Tornos' 1000th customer to activate a TISIS license. Mr. Ruiz declares: "This software proves the most welcome support at all levels. It is extremely easy to cope with and constitutes a precious help for machine programming and set-up. It is a valuable advantage for the operator and is highly appreciated within the company, especially by those who are looking for optimum programming assistance. The editor boasts high performance and the correction in real time, 2D simulation, cycle time calculation and Gantt chart functions are really useful. The production monitoring functions of the software demonstrates that Tornos closely monitors the trends. We can thus feel reassured that Tornos is a high-quality partner being able to support us for our future requirements. That's why we are delighted to possess the 1000th TISIS license."

pibor.ch





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Chris Taylor, Managing Director (at the left), and Alex Taylor, specialist, in front of the Swiss DT 26, their first sliding-head automatic lathe.



CTPE's specialists found out that the sliding-head technology not only enabled them to produce parts of higher precision but also to reduce the cycle times by up to 80%.

Tornos Swiss DT 26 delivers 80% cycle time reductions at CTPE

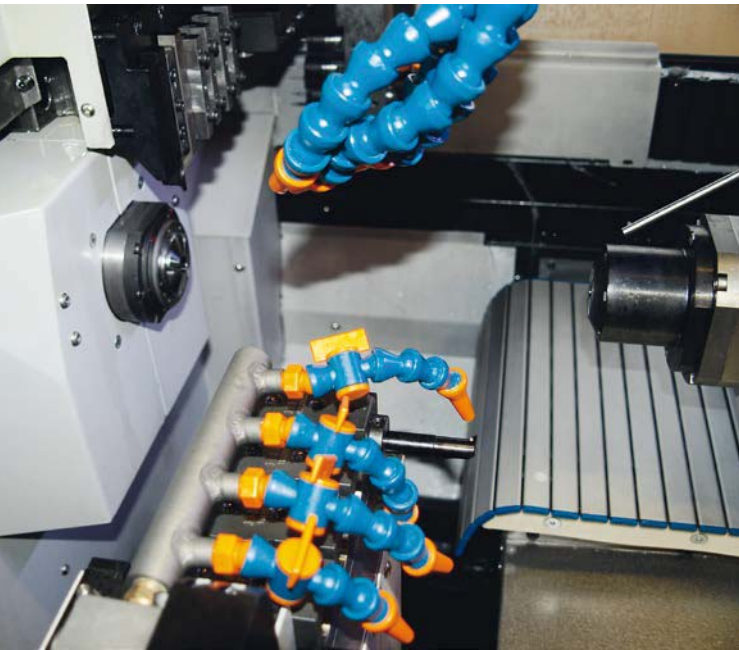
A leading subcontract supplier to the healthcare, medical and scientific sectors has seen cycle times cut by 80% in some instances as a result of investing in its first sliding-head turning centre – a seven-axis Tornos Swiss DT 26. Previously relying on fixed-head turning centres, the introduction of the Swiss DT 26 has also eliminated the need for second operations, leading the company to anticipate a rapid return on its investment.



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www.ctpe.co.uk

In 1989, some 12 years after completing his apprenticeship with a scientific instrument manufacturer, Mildenhall-based CTPE Ltd was formed by the current Managing Director Mr. Chris Taylor. Specialising in components manufactured from plastic and non-ferrous metal, the company has recently been adding to its machine tool portfolio, currently running with five CNC vertical machining centres and three fixed-head turning centres. However, when one of CTPE's multinational healthcare customers began to introduce JIT manufacturing, complete with weekly scheduled deliveries and monitored performance (quality and delivery), the company decided to look at technology that could take it to the next level, namely its first CNC sliding-head.

"To meet demand we were setting up the same batch of say 200 plastic turned parts on our fixed-head machines perhaps twice a month, simply because we didn't have the time to produce larger, more economical batch sizes," explains Mr. Taylor. "As a result, we started to look at sliding-head machines as a way of increasing our capacity and throughput."



In-depth evaluation

CTPE looked at four major suppliers of sliding-headstock machines, conducting what the company describes as “an in-depth evaluation”. The results shaped a clear purchase decision in favour of the Tornos Swiss DT 26.

“One of the major issues related to our historical use of water-based soluble cutting fluids, which we find never give any problems with cleanliness, carryover or adverse effects on our plastic materials,” says Mr. Taylor. “However, we found that the major competitors to Tornos did not want to run their machines with soluble coolant, only neat cutting oil. We were told there would be restrictions to the warranty if we wanted to use soluble coolant, as the machines are not designed for that purpose. Conversely, the Tornos Swiss DT 26 has been developed for use with either soluble coolant or neat cutting oil.”

Another attributes that impressed Mr. Taylor and his team was the capacity of the machine. At 26 mm, CTPE discovered it could cover a large proportion of its current job profile, at a very competitive price.

“It was apparent that we could buy the Swiss DT 26 from Tornos for around the same price as most 20 mm capacity machines from other suppliers,” says Mr. Taylor. “We could have gone for a 32 mm machine, which is the next size up offered by most Tornos competitors, but found that the price rose by around 50%.”

CTPE also admired the fact that the Swiss DT 26 offers 10 kW of power on both the main and sub-spindles, which contrasts greatly to competitor machines, where lower-powered sub-spindles are commonplace. Although most of the parts completed by the company on the Swiss DT 26 to date have been machined from plastic, it won't always be that way. CTPE has already introduced a number of aluminium components to the machine since it was installed in October 2016, where high-powered spindles help remove stock quicker, and facilitate the use of larger drilling and boring tools.

Guide Bush to Non- Guide Bush machining

“We also like the ease and speed with which the Swiss DT 26 can be switched from guide bush to non-guide bush mode,” says Mr. Taylor. “A lot of our parts are short and so the ability to switch in just 15-25 minutes is very useful and saves money on tooling and bar wastage. In guide bush mode the bar end is generally longer, but in non-guide bush mode this is reduced to around 65 mm, increasing the number of parts we can machine from a bar and gives a significant saving if we are turning expensive plastics such as PEEK™.”

Aside from PEEK™, the company also uses its DT 26 to machine acetal, PTFE, PVC, nylon 66 and Rulon®, as well as 2024 aluminium, with some parts demanding tolerances in the region of 10 µm.

“The Tornos machine will hold 5 µm all day long, so dimensional accuracy is not an issue,” says Mr. Taylor. “We have found the machine to be far more sturdy and repeatable than our fixed-head machines, which means – for the first time – we can run unmanned whenever demand dictates, safe in the knowledge that parts will be produced to specification while we are not here.”

Unmanned production

The Tornos Swiss DT 26 can produce components up to 200 mm in length and is paired with a Tornos Robobar SBF 326 (3.2 m capacity) barfeed for unmanned production. Inside the machine, as standard can be found six turning tools, four driven radial tools, an angle tool post that enables the installation of four tools each for front and back machining, and four independent positions for use with the counter-spindle, all with the ability to use live tools.

The modular concept of the Swiss DT 26 means the machine configuration can easily be adapted to meet requirements.

At CTPE, the machine has been set to work producing parts typically in batches of 1000 to 2000-off. However, due to the ease and speed with which the machine can be set up, Mr. Taylor says it is equally economical to run batches as small as 300 to 400-off. On average, parts produced by CTPE are around 20 mm long and 15 mm in diameter, while some feature complex features such as end barb fitting for hoses, as well as side port holes. A typical cycle time on the Swiss DT 26 is 20 seconds, or up to 50 seconds for more complex components.



“Compared with our fixed-head turning centres, we’ve seen some cycle times reduce from 150 seconds, to just 30, which is an 80% reduction,” states Mr. Taylor. “Moreover, some of those fixed-head parts will still require a second operation, not to mention deburring and picking-out. We have none of those tasks with our sliding-head. Without doubt, we should have bought one years ago.”

Effective swarf management

Another advantageous attribute of the Swiss DT 26 is its kinematic design, which promotes both rigidity and swarf evacuation, particularly in combination with the standard 20 bar high-pressure coolant delivery, as Mr. Taylor can testify: “Effective swarf management is vital when machining plastics, as it is easy for issues like swarf wrap-up to develop, not to mention component burning. However, I’m pleased to say we have not encountered any such problems with our new machine.”

The Swiss DT 26 at CTPE was also supplied with the Tornos TISIS 2.0 programming and machine management software, which Mr. Taylor describes as “easy and quick to use”. Designed for all Tornos products working in ISO mode, TISIS has been continuously expanded to provide the users with a steadily increasing number of features, such as program optimisation, to ensure the minimum cycle time, program wizard, which simplifies programming and helps prevent errors, machine production monitoring and Industry 4.0, giving users access to production output in real time wherever they happen to be.

CTPE is currently enjoying a spell of continued year-on-year growth, and it’s easy to see why. The introduction of the Tornos Swiss DT 26 is the company’s fifth CNC machine tool investment in the past five years, helping to assure the future of this progressive precision machining specialist.

ctpe.co.uk



Youtube movie
<https://www.youtube.com/watch?v=RfFAMRX1l1I&feature=youtu.be>



With Précijura, versatility and flexibility have been a top priority for more than 40 years. The innovative company has always been doing its utmost to even exceed the high expectations of the customers.

PRÉCIJURA SA:

Versatility

is paying off

PréciJura SA headquartered in Équevillon in the French Jura Mountains is a specialist in the production and machining of high-precision turned parts. Through the years, this company has gained an excellent reputation as an SME. The company management believes that versatility and flexibility are the two basic requirements for working successfully in the precision machining industry. Working closely with reliable and powerful partners such as Tornos and Motorex, delivers upon this operational philosophy.



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In the French Jura Mountains, bar turning has a long tradition and against this backdrop, it is no surprise that expertise and specialization have fostered the creation of industry-specific hotspots. For a company to be able to prove itself in this environment, superior skills and achievements are required. PréciJura SA is a prime example of this.

Combining precision with flexibility

With the production of high-precision parts from difficult-to-machine materials in small to medium batches, PréciJura SA has constantly given proof of their proficiency since 1976. Today, the company with 50 staff belongs to the Ardec Metal Group (www.ardec-metal.fr) and supplies manufacturers from various fields of technology such as aerospace, automobile, defense, optics, jewelry, micro-hydraulics, pneumatics, robotics, connectivity, telecommunications, railway and medical industries. This enumeration alone is a testimony of the impressive skills of PréciJura. Every industry and every customer has



The ongoing renewal of the machine inventory has a long tradition with Précijura and it has a large share in securing the company's market position.

its own guidelines and establishes exactly defined requirements concerning the parts to be manufactured.

From the year the company was founded, Précijura has been relying on Tornos machines (R10, R16, MS7, etc.). Today, the mixed machine inventory comprises over 50 machines and the company is working with approximately 40 Tornos machines of the ENC,

Sigma, Delta, Deco 8, 10, 13, EvoDeco and Swiss GT 32 types. They can machine bar diameters from 2 to 32 mm. In addition, Précijura has milling and machining centers that are used for special reworking/machining tasks for bar diameters from 32 to 65 mm. Apart from versatility and flexibility; the high degree of vertical integration is another key to success for Précijura.



Material portfolio of Précijura SA



Motorex Ortho NF-X 15 is suitable for machining non-ferrous metals, aluminum, aluminum bronze, light-metal alloys, steel, titanium, stainless steel, plastics and other special materials.



With a surface area of 3200 m², PréciJura's modern production facility offers ample space for its specialized staff of about 50 people and for just as many machine tools.



"From various perspectives, the use of Motorex Ortho NF-X on our Tornos machine tools has enhanced everyday production in a sustained manner." Jean Michel Vallet, Technical Director at PréciJura SA.

Machining an enormous range of materials

With the move to the new premises with a surface area of about 3200 m² in 2008 and with the ongoing renewal of its machine inventory, the company has been consistently focusing on cutting-edge technology. This enables PréciJura to increasingly run highly demanding and complex applications ranging from A to Z in Équevillon.

"Tornos machines are ideal for this since they can be expanded with various special equipment depending on the machining requirements," Jean Michel Vallet, Technical Director, declares. In addition, the elaborate machining of a wide variety of materials (titanium, stainless steel, steel, exotic materials and plastics) requires a special cutting fluid since this has a direct impact on the production success. The change



TORNOS

Swiss GT

Your advanced machining solution

The Swiss GT family meets a clear need in the market for this type of mid-range machine. These are extremely attractive products for those working across several market segments: thanks to its 6-axis kinematics, this machine is almost infinitely adaptable.

The Swiss GT 26 and the Swiss GT 32 can be equipped with up to 40 tools, 14 of which rotate, while the Swiss GT 13 can be equipped with 30 tools, 12 of which rotate. The Y axis offers greatly increased machining capability in secondary operation and allows some complex workpieces to be produced without reworking. These machines have modular tooling positions, enabling you to perform advanced tasks such as thread-whirling or polygon turning.

Able to easily switch to working without a guide bush, thanks to the motorised guide bush with synchronous motor, and the simplified management of machining processes, Swiss GT machines have proven themselves highly effective partners in any situation.

The B axis can also significantly boost the performance of the Swiss GT 26 and the Swiss GT 32, meaning they can tackle machining of almost any part imaginable. The Swiss GT 26B and the Swiss GT 32B are the only automatic turning machines equipped with a B axis featuring a modular position which can incorporate either a fourth rotating drilling station or a true thread-whirling head.

Swiss GT		13	26	26B	32	32B
Maximum diameter	mm	13	25.4	25.4	32	32
Number of linear axes		6	6	6	6	6
Number of C axes		2	2	2	2	2
B axis		-	-	Yes	-	Yes
Number of independent tool systems		2	2	2	2	2
Total number of tool positions		30	40	36	40	36
Position for rotating tools		12	14	16	14	16

“From various perspectives, the use of Motorex Ortho NF-X on our Tornos machine tools has enhanced everyday production in a sustained manner”

to the universal high-performance cutting oil Ortho NF-X 15 by Motorex was primarily motivated by the fact that Précijura wanted to machine the requested materials mentioned above with the existing Tornos machines.

This oil was chosen based on the most demanding material. In this case, a part for the medical industry made of stainless steel 1.4472 with a high basic hardness was taken as a basis. Subsequently, the cutting oil was tested for its capacities when being used for the common materials most frequently used. These tests showed fully convincing results.

For the development and testing of its machines, Tornos uses cutting oils and fluids from Motorex. This collaboration guarantees the user will get an integral solution that boasts maximum process reliability.





Quality can be measured. Précijura has been certified in accordance with ISO: 9001 and EN: 9100.



At Précijura, Motorex Ortho NF-X 15 has been showing compelling results for many years now. Especially for the successful machining of parts for the medical industry, it is crucial to use fluids without critical ingredients while ensuring a continued high level of performance.

More freedom thanks to universality

What appears to be the same cutting oil at first glance; will turn out to be most different in terms of dimensional stability, surface finish (Ra value), tool life and cycle time when being used for demanding applications. To date, the universal high-performance cutting oil Ortho NF-X by Motorex has already demonstrated its specific qualities for Précijura on many occasions. With the Swisscut Ortho NF-X cutting fluids that are free from chlorine and heavy metals, the company can machine various types of materials, be it high-alloy steels or implant steels or even non-ferrous metals and aluminum with the very same cutting oil. This is an absolute novelty in advanced manufacturing technology and grants the users maximum freedom. Even in terms of logistics, Précijura was able to enhance its processes. Furthermore, the traceability was simplified while warehousing and procurement costs have been reduced.

The customer demand shows the way

Continuous optimisation of the processes, strict quality control (ISO 9100:2016) and collaboration with competent partners are the optimum conditions to ensure maximum customer satisfaction. That's why Précijura offers numerous subsequent processes in addition to traditional machining processes. Whether electric discharge machining, engraving, heat treatment, selective annealing or other processes are concerned, customer needs have always top priority. This policy has been a long-term commitment for the company and it still pays-off today.

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Multiple feeding – Long parts – ISO machines

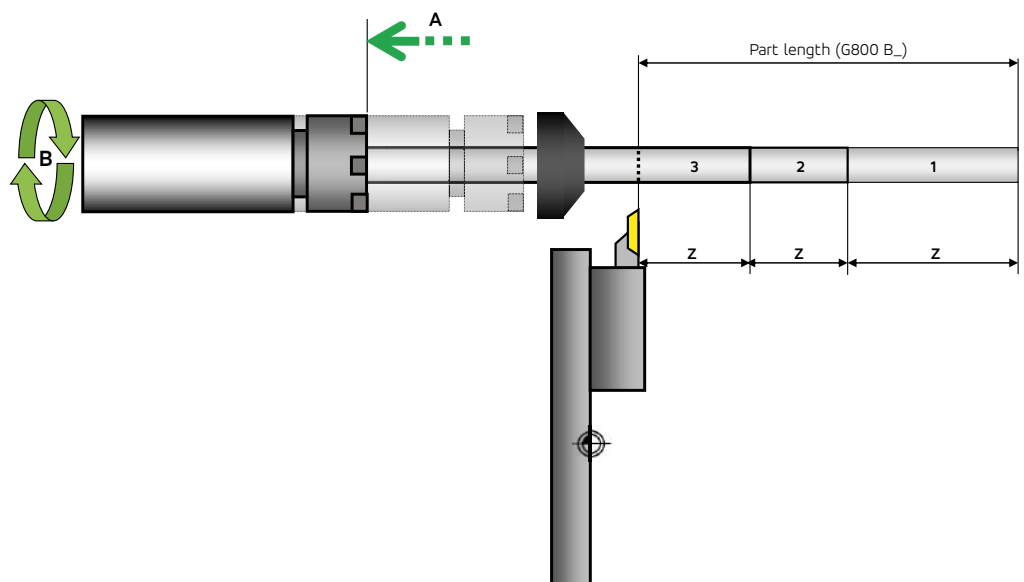
On a machine, machining a part that is longer than the stroke of the machine main spindle in a single feeding is impossible.

TORNOS

This is why Tornos now offers the chance of feeding several times a given quantity of material for a single part.

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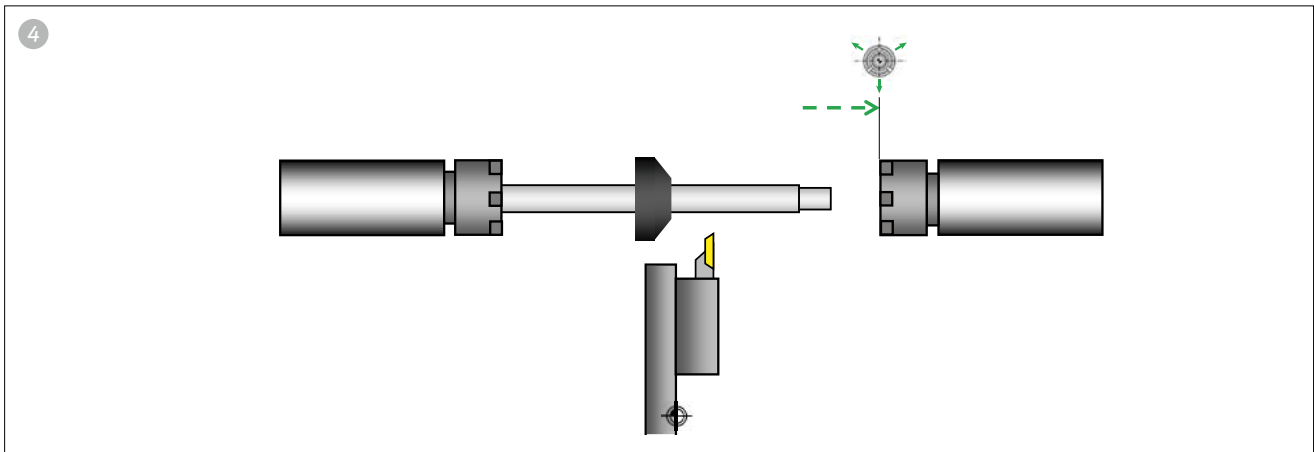
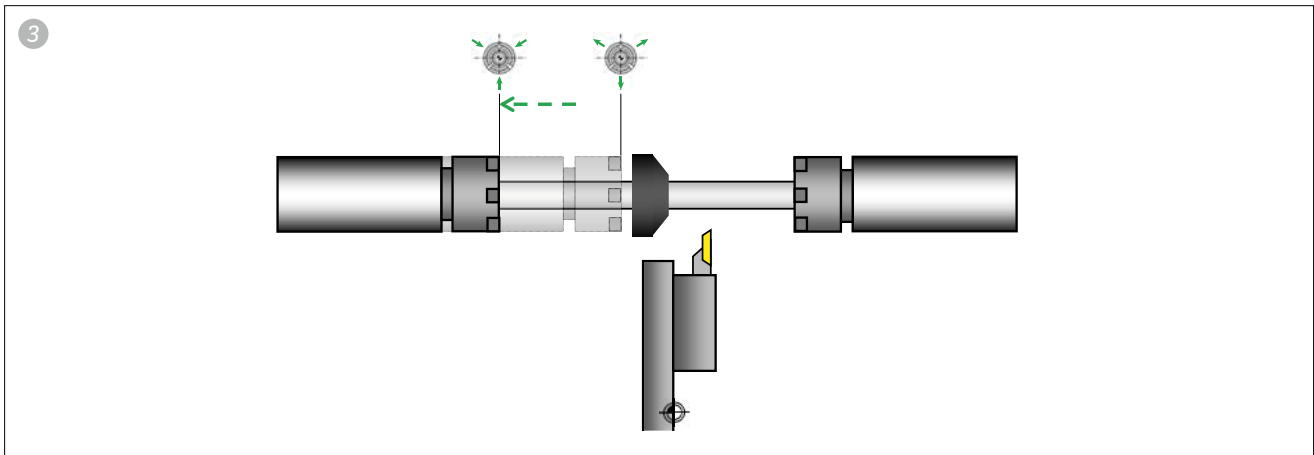
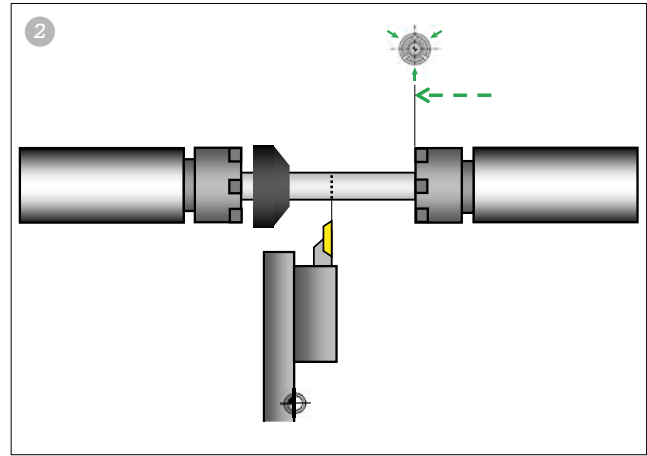
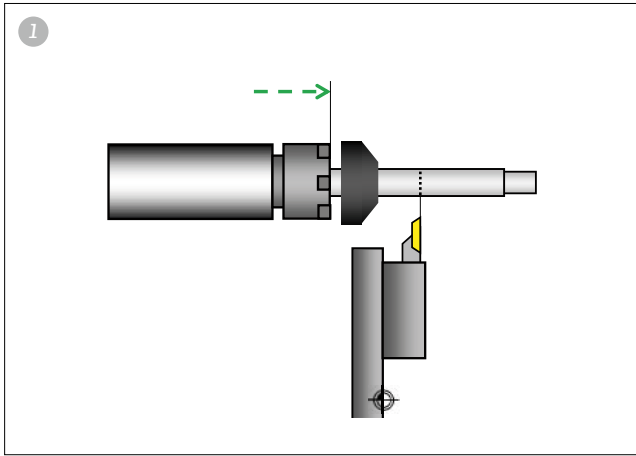
Example with 3 feedings:



Work sequence

To perform additional feeding, the work sequence is as follows:

- 1) Main spindle (hence the bar) positioned forward
- 2) Bar locked with the counter spindle (prevents the bar moving during feeding)
- 3) Feeding of a certain quantity of material
- 4) Bar released by counter spindle



Tornos macros

Tornos macros allow you to program this operation very simply.

To do so, the following macros play a fundamental role:

G800 (B_ K_) Indicates the (B) and the number of feedings to machine a part (K).

G912 (Z_) Indicates the quantity of material to feed.

G924 (Z_) Indicates the bar locking position.

SAMPLE PROGRAMMING	
"Cutting tool" channel	"Counter spindle" channel
G800 A12 B80 C40 D5 K2 (part variables initialisation)	
...	
...	
M9002	M9002
...	
G910	
M9003	M9003
N1 M120	N1 M120
...	...
M9004	M9004
G912 B300 Z50 (Feeding 1)	
G0 W0.2	
G0 X21 T110 D0 (Cutting tool retraction)	
M9005	M9005
... (Mainwork machining)	... (Backwork machining)
...	...
...	... (Part extraction)
...	...
M9006	M9006
M103 S300 P1	M11
G0 Z-50 T110 D0 (Bar positioning)	G4 X0.5
	M404 S300 P4
	M418
M9007	M9007
	G915
	G924 Z-25 (bar locked)
M9008	M9008
G912 B300 Z30 (Feeding 2)	
M9009	M9009
	M11
	G4 X0.5
	G28 W0
M9010	M9010
... (Mainwork machining continued)	...
...	...

Model programs

Tornos now also provides program models that feature two feedings.

This will allow you to minimise and simplify your programming.

The machines which feature model programs are as follows:

- CT 20
- EvoDeco 10/16/20/32
- Swiss DT 13/26
- Swiss GT 13/26/26B/32/32B
- SwissNano

Additional information

Ejection device:

It is important to know that, to eject long parts, sometimes an adapted ejection system needs to be arranged. Tornos offers optional long part ejection systems.

For ejection systems where the part crosses the counter spindle, the counter spindle collet has to have the same diameter as the largest part diameter.

Programming:

In the model programs delivered by Tornos there are 2 feedings, but additional feedings can naturally be added.

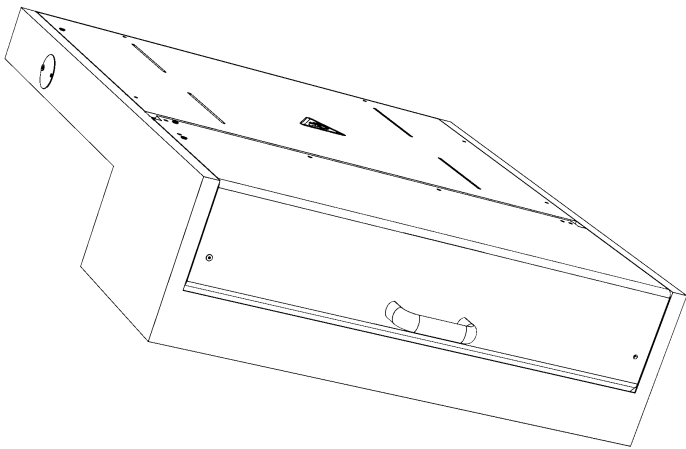
Long part ejections should be programmed by the user according to the ejection system fitted on the machine.

The number of feedings set in argument K of "G800" should correspond to the number of "G912" in the program.

When a part is machined using several feedings "G800 K_" arguments Z of G912 must under all circumstances be programmed.

The part length set in argument B of "G800" should correspond to the total values contained in arguments Z of "G912" in the program.

TISIS automatically checks that programming of arguments is consistent, and if this is not the case, any errors are underlined in the program.



APPLITEC

APPLITEC

SWISS TOOLING



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TORNOS

SwissDECO 36

Impressive down to the tiniest detail and imposing as an entity, the new Tornos SwissDECO 36 is way more than a cluster of cutting-edge technologies brought to perfection. It represents the experience and the ingenuity of the Tornos engineers. This ultra-performance machine is able to machine bar stock with diameters up to 36 mm and features a 12-position turret that enables the most complex workpieces in the market to be machined.

tornos.com



*Performance
at its best*

SwissDECO 36