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SUMMARY

"TISIS allows our customers to obtain an all-in-one solution with intuitive design that focuses on the users."

Patrick Neuenschwander R&D Software & Hardware Manager

Bar turning in times of digitalization

Patrick Neuenschwander R&D Software & Hardware Manager

Today, the tendency towards digitalization in industry brings about fundamental changes of the frame conditions of machine tools and this is true in metal cutting with chip removal.

In this context, Tornos has already prepared its machines for digitalization by equipping them with TISIS and its Connectivity Pack – this has been available since 2013 with the SwissNano. Since 2013, TISIS has been playing a leading part in the digitalization plan of the Tornos Group. In the meantime, more than 1000 TISIS licenses have been delivered to the market.

TISIS allows our customers to obtain an all-in-one solution with intuitive design that focuses on the users. It provides detailed information on the state of each machine, the production status and the exact end time of production. TISIS enables its users to know the exact time when it is necessary to reload bars into the machine – this information is even provided remotely via a Smartphone and our TISIS Net service.

With SwissDeco, we have now reached the next level. It features a completely new interface that interacts with the operator. Furthermore, the new vertical console allows for a quick start of the machine. The software has been completely redesigned: the current TISIS user quickly gets the idea of it and, in addition to the proven functions of TISIS - it is now possible to manage the whole machine system including the peripheral devices by means of TISIS and its intuitive, user-friendly and innovative interface. Many functions have been added. For instance, the possibility to directly observe the execution sequence of the program and to know the progress of all the ongoing machining operations.

Our great innovation is the new TISIS system Optimove. This patented system optimizes the cycle times of the machine. The movements take place just in time, non-essential operating elements were omitted and the system enables the machine to optimize the cycle times while minimizing mechanical wear and energy consumption in the process - all this is achieved without any operator intervention.

This system has been designed for fully utilizing the performance and potential of the SwissDeco machine. Using this system, the high-performance machine can be programmed and managed easily and effortlessly. Thanks to the intuitivity of the system, operators can be trained in a very short time period.

You are welcome to discover the SwissDeco and our new TISIS version on our site in Moutier or during an exhibition. You will be surprised by the functionalities of this software and its ease of use.

SWISS MADE

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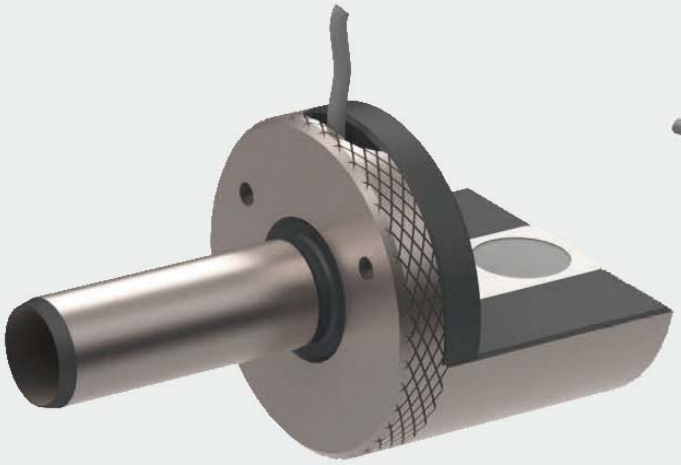

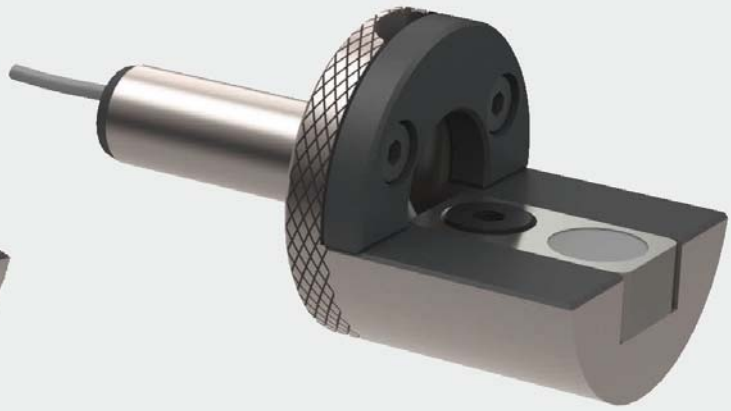

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TORNOS SWISSDECO – Perfect *integration of peripherals*

SwissDeco is a new platform that is ready for Industry 4.0 and provides its users with excellent performance and autonomy.

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Creating a new platform is no easy task: It's not enough to design the mere machine, but the machine must also be complemented by appropriate peripherals and equipped with the required accesses to make it suitable to be integrated in the factory of the future.

An integral peripherals package

From the very beginning, SwissDeco has been designed with a container comprising all the peripherals required for operation to enable it to most efficiently respond to the various requirements of customers. The peripherals are arranged in the so-called easyfluid unit on the left side of the machine.
The easyfluid unit comprises all elements that are required for SwissDeco's optimum operation. It is separated from the machine and this makes it easier to keep vibrations or even heating under control since it is fully independent of the machining area. The easyfluid unit can be equipped with various options depending on the machine configuration and the requirements linked to workpiece machining. Against this backdrop, 3 high-pressure pump types are offered to support machining on SwissDeco. Thanks to the cooling unit, the spindles are able to operate steadily regardless of the speed range and of the current load.

With SwissDeco, Tornos wanted to design the ideal machine that is subject to minimum stress. They wanted it to be profitable for simple parts while enabling its users as well to produce even their most complex parts at ease.


TORNOS
SwissDECO 36
TORNOS

An additional tank with a capacity of 400 liters is an integral part of the easyfluid unit; it can optionally be equipped with a heat exchanger.

If necessary, a paper filter unit can also complement the periphery. This option ensures uncompromising quality and life of the cutting oil. In addition, the easyfluid unit can be provided with an oil mist separator. Thanks to its compact dimensions, if perfectly fits into the design of the machine. By means of the HEPA filter offered as an option, smoke problems can be eliminated with an efficiency of 99.95% MPPS.

Large range of high-quality pumps

The specific application and the cutting oil selected from a broad range of options determine which pump is required to apply the appropriate pressure. The key component of each high-pressure system is the pump. The easyfluid cutting oil management solution offers a large range of pumps for the user to be able to choose the most suitable pump for his application. Whatever cutting oil is used or pressure is required, the appropriate pump (60, 120 and 340 bar) is always available.

A maintenance-free machine

SwissDeco is equipped with a chip conveyor that is coupled with the easyfluid system. The machine strictly follows the "zero maintenance" concept: in fact, everything has been done to minimize or even to completely avoid downtimes. "The challenge was clear: during the product design stage, our customers insisted on getting a machine that required as little maintenance as possible," emphasizes Michael Dunner, SwissDeco Product Manager at Tornos.

A high-end chip management system

With the conveyor, Tornos succeeded in combining chip removal and cutting oil filtration to an integral system. The modular system ensures easy chip removal for various materials and chip types including ribbon chips and spiral chips. Only very few fine machining residues and chips end up in the coolant tank, which can even be eliminated by equipping the machine with a paper filter system.

A fully integrated bar feeder

Just like any Tornos machine, SwissDeco can be provided with a Tornos Robobar SBF-type bar feeder that significantly simplifies machine operation. Its full integration enables the operation in synchronization with SwissDeco while ensuring first-class performance.

Ready for Industry 4.0

SwissDeco has been configured with a robotic part outlet which enables the machine to be easily combined with a palletizing system or any other automation system. The user can thus consider a broad range of applications, from cleaning to measurement. Thanks to the open architecture of the TISIS software, it's a breeze to perform corrections during the machining process.

SwissDeco continues its roadshow in 2018 and will be presented at the IMTS in Chicago from 10th to 15th September and at the AMB in Stuttgart (Germany) from 18th to 22nd September.

For further information, please contact your Tornos dealer.

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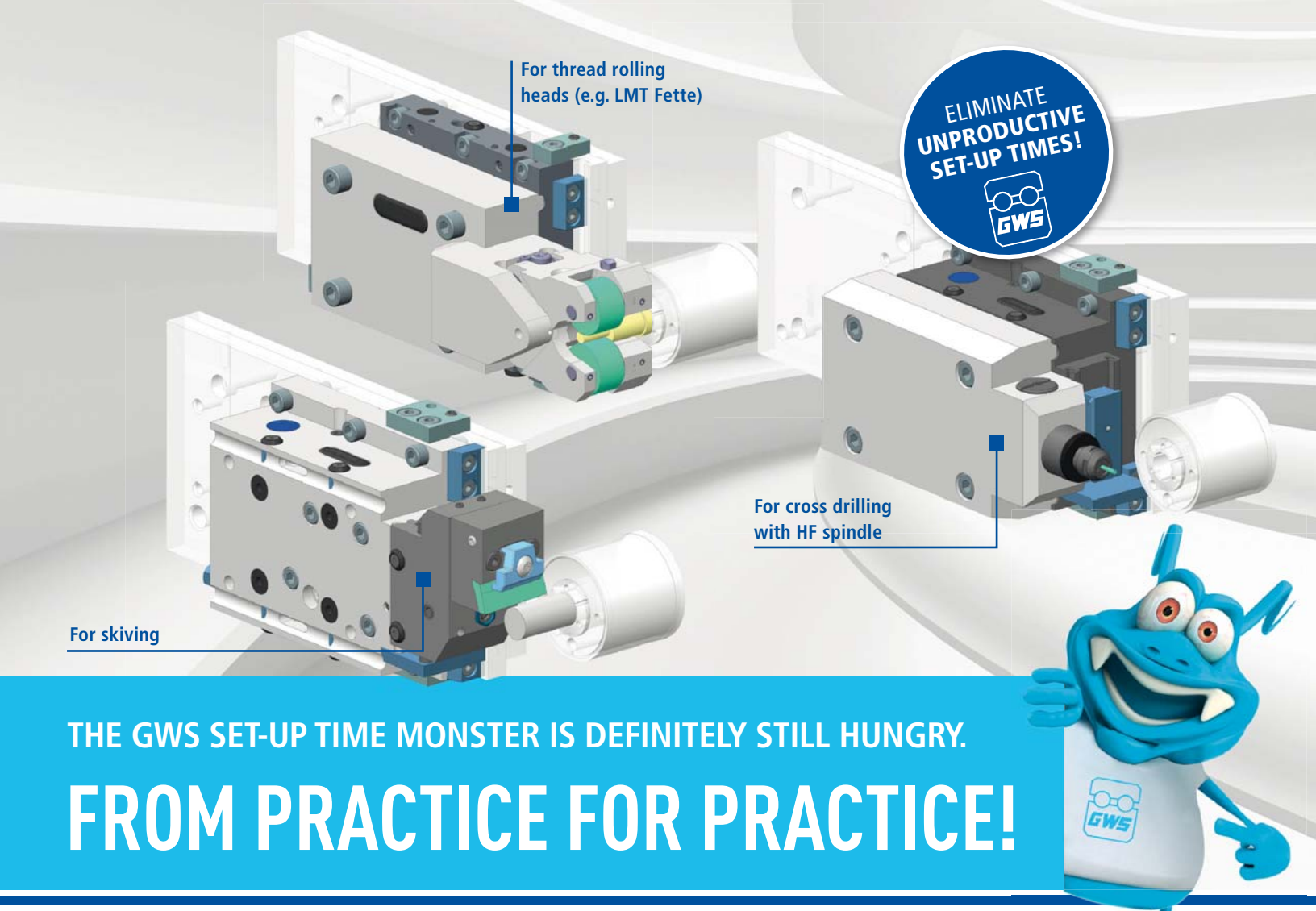

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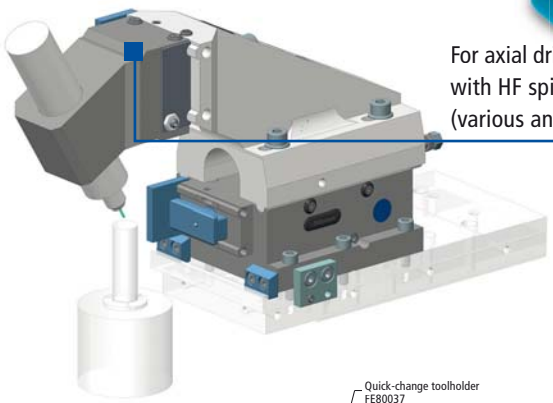

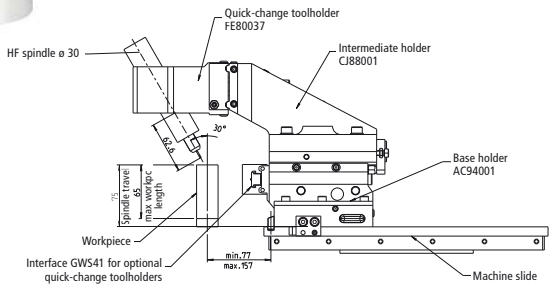

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TORNOS SWISSNANO:

Pushing the limits of

extremely small even further

The SwissNano has become an industry standard in the production of workpieces with very small dimensions. Designed for the clock and watch industry, this machine is capable of producing 80% of movement components for watchmaking.

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In order to ensure the high precision and reliability of the timekeepers, watch manufacturers look for machines that are capable of production within tight tolerance ranges with small dimensions. The SwissNano has proven its worth since 2013. Today, more than 300 machines are installed with customers, providing complete satisfaction. The fact that almost each customer that purchased a SwissNano has bought a second machine a few months later is positive proof for the efficiency of this machine.

A perfect basic machine

The key to success of the SwissNano resides in its symmetrical structure: thanks to the stable thermal behavior as well as excellent tool life. Even with tough materials and despite a performance that may appear limited, the SwissNano features excellent capacities. Philippe Charles, Product Manager at Tornos says: "the machine spindle was dimensioned for providing the power necessary for machining nothing less than extremely hard stainless steel. We want to offer machining performance reaching the

optimum without generating unnecessary heating. A spindle of very high power makes no sense with such a small diameter. Therefore, the power is adjusted to an adequate level - with the advantage that the machine is more energy-efficient."

Kinematic system designed for high performance

Machine ergonomics are a crucial factor. With bars of such small dimensions, centering the tools is a challenge. Furthermore, the engineers have developed a machine where the operator can face the spindle. The counter-spindle on 3-axes allows for entirely numerical settings; this proves to be a decisive advantage for the operator using the machine. Apart from the counter-spindle, the second gang tool post can accommodate tools underneath the counter-spindle and thus increases the machining capabilities of the machine.

Watchmaking
Diameter: 1.5 mm
Length: 2 mm
Material: stainless steel

Depending on the tool carrier, 2, 3, or 4 tools can be mounted underneath the counter-spindle. This means that machining can be done simultaneously with both gang tool posts. Thanks to this kinematic system, it is therefore possible in particular to realize simultaneous roughing and finishing operations. But there is still more: it is also possible to turn and drill simultaneously as well as deburr and hob or support the workpiece during tricky operations. In order to make the best use of this kinematic system, Tornos has developed a series of devices that allow the SwissNano to address a large range of workpieces.

Various possibilities

Despite its simple appearance, the SwissNano offers excellent machining options and unrivaled flexibility. This flexibility is attributed to a large assortment of options that allow it to meet the market requirements. For instance, the thread milling device or the gear hobbing unit. If required, the machine can also be equipped with high-frequency spindles or with a vacuum system. The 6-axis kinematics of the machine enable numerical settings to be used in all dimensions.

Electronics
Diameter: 0.25 mm
Length: 9 mm
Material: steel

Parts with extraordinary characteristics

"We thought we had reached the limits of the extremely small, but the SwissNano allows us to explore the most extreme depths thanks to its ergonomics which allow for reaching the limits of the extremely small more conveniently", states Philippe Charles.

Electronics
Diameter: 0.4 mm
Length: 4.5 mm
Material: brass

If one asks a trendsetter what characterizes the SwissNano, the answer is simple: it is a machine with which it is easy to work. It is stable, easy to use and allows the machining of parts with small dimensions effortlessly. "I have seen production machines producing parts with a diameter of 0.2 mm", says Philippe Charles. The machine can machine bars of 1 mm diameter and is capable of producing in tolerances of +/- 0.001 mm, ensuring excellent surface finishes. This extremely low-noise machine is also very compact and fits in any manufacturing workshop instead of a cam-type machine.

If you want to get detailed information, do not hesitate to contact your Tornos expert.

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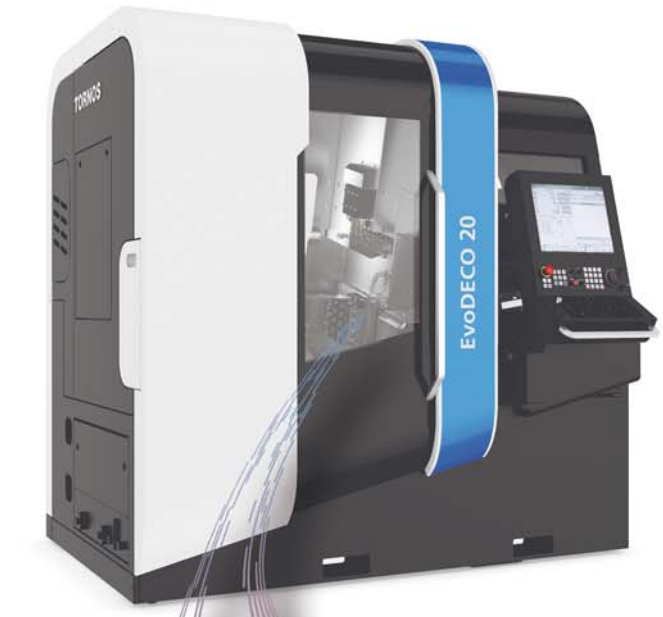

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The BA 1008 XT now offers its exceptional performances under the Tornos brand

TORNOS BA 1008 XT:

A machine for even the most complex parts

The BA 1008 that was launched shortly after the SwissNano is a small, compact bar milling machine designed for the production of prismatic parts.

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In the field of bar turning, there are cases where turning actually fades into the background and manufacturers have to focus on milling. While EvoDeco or even Swiss GT-type machines are perfectly familiar with such tasks, there are still some workpieces that cannot be machined with these machines. It is here that small milling machines make the difference.

The birth of BA 1008

Bearing this in mind, Tornos decided, together with Almac to produce such a machine based on the SwissNano's structure. This compact and rigid structure benefits from perfect thermal behavior and thus was the ideal basis for the design of the BA 1008 machine. The three tool systems of the SwissNano were replaced by spindle blocks that enabled the machine to be converted into a small milling center. That is when BA 1008 started its triumph. This intriguing machine with attractive design soon attracted the attention among experts. It made its debut with watch components such as indexes, pallets, balance-spring stud holders and other micromechanical components requiring diligence, precision and productivity.

The machine boasts optimum ergonomic features and high ease of use, is based on the expertise of application engineers who outdid each other in creativity for the user to be able to realize increasingly complex parts. The BA 1008 has a maximum

machining diameter of 16 mm and can produce components with a maximum length of 28 mm. The secret of the excellent productivity of the machine is in its rigidity. It features enormous feedrates and thus a high efficiency of the machining process.

A turnkey solution

Over time and based on the variety of demands, the BA 1008 machine has been refined. It can now be equipped with a B-axis on the front spindle block and with a full enclosure of the machining area especially designed for precious metals to ensure maximum chip recovery. In addition, the machine can be provided with an optional bar feeder for enhanced autonomy. In this configuration, it can machine bar stock. "It is beyond doubt that the BA 1008 is the most flexible machine in the market," explains Almac's Product Manager Mathieu Jorda. He continues: "It has been constantly enhanced to make it suitable for the challenges it is facing in everyday operation with our customers. The best proof of this constant adaptation is BA 1008 HP, the high-pressure machine version with excellent design featuring a container that comprises high-pressure pump, filter system and bar feeding device."

2008-2018: A success that inspired to integrate Almac under the Tornos label

When Tornos purchased Almac in 2008, their intention was clear: they wanted to capitalize on the unique micro-milling expertise of the company based in La Chaux-de-Fonds and open up the doors to the global market for Almac. The perfect examples for these efforts are still the BA 1008 and SwissNano machines. Beyond that, the know-how and the expertise of the Almac engineers have enabled Tornos to realize a B-axis with which they equipped the Swiss GT 26 and Swiss GT 32. It should also be noted that the concept of this B-axis has now been adopted by Tornos' competitors. "Almac enabled us to offer our clients from the medical industry specific solutions with our CU range," emphasizes Philippe Charles, Head of Swiss-type Product Management at Tornos.

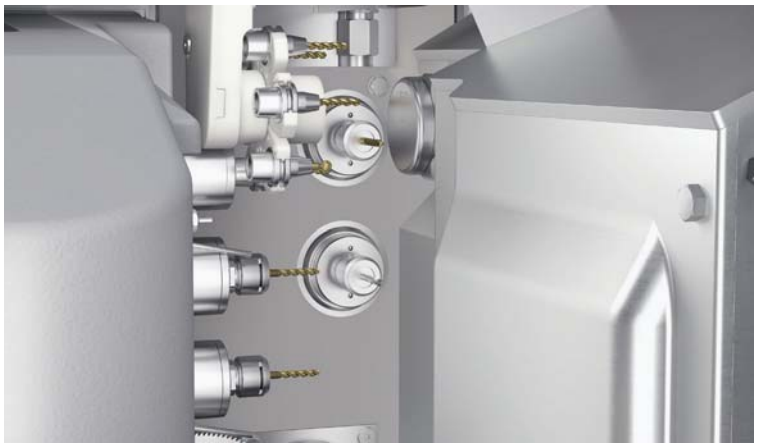
Thanks to the collaboration between Almac and Tornos, it became possible to offer the customers all-in solutions. But now it's high time to advance and take the last step. The Almac product range will now be incorporated into the Tornos portfolio that will hence increase accordingly. For all service and maintenance issues, Almac's customers will still be serviced to by the same contact partners.

Tornos BA 1008 HP

The BA 1008 HP is a machine equipped with high-pressure unit that allows cutting oil filtration and optimum chip management. The machine boasts through-spindle coolant supply (120 bar) enabling it to tackle more demanding machining tasks such as the machining of bracelet links, fasteners or optical fiber connectors made of stainless steel, gold, titanium or platinum. The BA 1008 HP is able to meet any requirements involving even the toughest materials. In the tuning stage, it has succeeded in drilling holes with a depth of 20 mm in 316L stainless steel at a feedrate of F800.

Tornos BA 1008 XT

The BA 1008 XT machine, recently presented in our Decomagazine as the BA 1008+, now completes the BA 1008 machine range. In the last few years, BA 1008 has made tremendous progress as to its peripherals.



Of course, we have also adapted the tooling in its machining area. Depending on the specific machining requirements, the machine can be configured with standard mechanical spindles or high-frequency spindles. The machine kinematics and its performance make the machining of more complex parts a walk in the park. Complex parts very often mean that more tools are needed. There certainly is the possibility of using shaping tools to get rid of certain restrictions but this cannot be realized in any case and the economic circumstances do not always permit this kind of proceeding.

Furthermore, BA 1008 XT can be equipped with two tool changers:

- *a 10-position tool changer for the front spindle block,*
- *a 6-position tool changer for the lateral spindle block.*

This means the BA 1008 XT can now be equipped with thirteen additional tools and its tool capacity is significantly expanded to 23 tools. 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 therefore enhanced and the machine performance is increased. The two tool changers enable sister tools to be used in case of machining operations that involve considerable wear. The autonomy of the machine can be increased significantly. As an option, the BA 1008 XT can be provided with a B-axis which makes it a fully operative milling center offered at an extremely competitive price.

The tool changer design has been optimized to avoid any chip traps and to guarantee perfect chip flow. If required, the machine can be equipped with the full enclosure for machining precious metals.

"There are similar machines on the market, but no other machine is able to adapt to the requirements of the workpiece with the same finesse as the BA 1008," explains Mathieu Jorda. The Almac specialist adds: "And, what's more, the BA 1008 is the most compact machine in the market. The footprint is peerless and the same applies to its price. The BA 1008 boasts a superb cost/performance ratio. In fact, we do not only know that our BA 1008 can machine virtually any workpiece but we know as well that it is unlikely that any other machine is able to compete with it."

Perfectly complementing the range of machinery

The BA 1008 perfectly fits in the Tornos portfolio; the matching rate when complementing an EvoDeco 16 Swiss-type lathe is 100%. Thanks to its modular kinematics, the latter can also be converted into a milling center. However, it cannot keep up with the the BA 1008 as regards the level of customization. The BA 1008 fits so well in the range of machinery that it is even used for reworking operations. In fact, some BA 1008 machines are used for finishing workpieces that were machined on MultiSwiss machines. This is the best proof – if any such proof were needed – of the extraordinary flexibility and performance of this unique small machine.

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Some of the world's rock stars rely on Tornos machines for every concert and every recording... even if they don't know it!

SCHALLER GMBH: Precision *meets sound*

Top guitar players and metal-cutting experts share a common passion – The search for the last µ and for the perfect sound. And that's what they find at Schaller, a company that produces mechanical components of absolute precision for electric guitars. To achieve this precision, Schaller relies on CNC automatic lathes from Swiss manufacturer Tornos.

Schaller
The Original Innovators

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The company Schaller GmbH is a German manufacturer of hardware for musical instruments and is headquartered in Postbauer-Heng near Nuremberg. It develops, produces, markets and sells machine heads, bridges, vibrato systems (so-called tremolos), strap locks and other guitar accessories on a global scale. The company's roots date back to 1945. In this year, it was founded as a radio shop by Helmut Schaller in Feucht near Nuremberg. Already in the 1950s, the in-house development and production of loudspeakers and amplifiers for the music industry evolved from the initial radio repair activities under the new name of Schaller Electronic.

The product range was then expanded to reverberators, pedals and distortion pedals. In the 1960s, Schaller's portfolio was further expanded to include tremolos, bridges and machine heads. The M6 machine head was the world's first fully enclosed and self-locking high-precision tuning machine. In 1968, the company Schaller moved from Feucht to Postbauer-Heng where a completely new production facility was built for the company to be able to

keep pace with the increasing demand. In the early 1980s, the production of loudspeakers, amplifiers and reverberators was stopped and the company began to focus exclusively on the manufacture of mechanical components. In 1981, Schaller developed a totally new product and had it patented. This product – the security lock – has revolutionized the connection between guitar and strap. Today, it is Schaller's top-selling product. In 2009, Dr. Lars Bünning took the helm as managing partner and geared the company towards the new strategy "Quality, Innovation & Service".

Quality, not quantity

The market for musical instruments and appropriate accessories is one of the rather tough ones. On the one hand, it very much depends on economic trends and, on the other hand the number of people playing an instrument is constantly decreasing. On top of that, suppliers from the Far East have been increasingly swamping the market with cheap instruments for several years now and have forced even established suppliers to save cost with the components. Deliberately, Schaller decided not to follow this trend and, as a German manufacturer, focuses solely on quality and precision at a reasonable price. "Instruments below 500 Euros are definitely not our cup of tea," the managing partner Dr. Lars Bünning emphasizes with great self-confidence. "For those guitar players who attach importance to perfect sound and appreciate quality, however, we are the first choice." It is not by chance that some international stars play on guitars with Schaller machine heads. Nevertheless, Schaller obviously has to compete with other manufacturers and take this into consideration for pricing. Against this backdrop, intelligent production management with appropriate cost control is mandatory.

A manufacture with a vast portfolio

Schaller exclusively manufactures in Germany and has a vertical integration of almost 100 percent. A staff of just under 80 employees covers the full range, from development, engineering, production and assembly to quality inspection as well as marketing and sales. As regards the quality standards, Schaller rather considers itself to be a manufacture, while a look at the output reveals that the company actually is a highly efficient manufacturing enterprise. In the online shop, the customer finds about 19,000 sales products and 160 end products that consist of up to 500 individual parts having 8 different surfaces each. The fact that Schaller supplies more than 1.5 million products per year lets us view the merits of the factory manager Dominik Weininger and his team in an entirely different light. For financial reasons, Schaller avoids extensive warehousing; nevertheless, the company aims at supplying its customers within six weeks. This requires rigorous production planning that leaves enough room for flexibility. A suitable machine inventory that enables precise and highly productive manufacturing is an indispensable prerequisite for this. That's why Schaller purchased its first Tornos machine at the end of 2016 – and have only had positive experiences with it so far.

Top machines for a top product

In 1981, Schaller developed the legendary security locks and had them patented. They have revolutionized the connection between guitar and strap. With these products, Schaller has set the benchmark in terms of design and functionality for decades, down to the present day. In 2018, Schaller presents the next generation of this top-seller, of which the company sells 1000 pieces per day on the average. The new S locks consist of unique one-piece strap buttons made

Schaller S-Locks are available in eight different finishes.

of toughest steel, suitable locks with ergonomic design for each leather strap as well as patent-registered locknuts with triple security architecture. By assembling these three parts, the Schaller employees produce the perfect S lock. The strap button is turned in one piece and can be mounted most easily using a 3 mm Allen key. A 4 mm thread realized in a special turning process ensures the best possible grip in the wood. It is turned from toughest steel with double wall thickness to make sure it is free from wear and safe to the maximum degree. The lock consists of a re-designed pin made of stainless steel and has a longer thread for thicker guitar straps. The lock wheel impresses with a 3-level security concept. The special patent-registered thread guarantees a safe grip and can be tightened and controlled even without using a tool. A 2-hole mount for 2 mm Allen key or screw driver enables an even tighter grip. A slotted set screw with flat point (2.5 x 5 mm) made of stainless steel makes sure the connection can be easily loosened. The characteristic feature of this innovation is absolute silence. The three components mesh with such a precision that there is absolutely no chattering noise. Even without going into great detail, experts will soon recognize the precision and the tight tolerances required when manufacturing the individual parts.

That's why Dr. Lars Bünning and Dominik Weininger extensively browsed the market and finally opted for Tornos. Meanwhile, the company possesses two Swiss GT 13 and two Swiss DT 26 machines from the Tornos portfolio. For Schaller, the advanced technical features of the GT 13 and its efficient 6-axis kinematics are the ideal prerequisites to meet all challenges associated with the production process. The Swiss GT 13 is intended for diameters up to 13 mm and has six linear axes and two C axes. These axes can be equipped with up to 30 tools, 12 of them being driven

Lars Bünning, Managing Director (right) and Dominik Weininger, Operations Manager rely on the absolute precision of Tornos solutions.

tools. Thanks to the intuitive user interface Tornos Machine Interface (TMI) and the TISIS programming system, ISO programming of the machine is a breeze. Thus, long downtimes are no longer a problem. With its wide assortment of tools, the Swiss GT 13 enables the complex S lock components to be produced with ease. The modular tool position enables state-of-the-art applications to be performed without major adjustment problems and thus make processes such as thread whirling, polygon milling and angular milling a cakewalk.

The Swiss DT 26 boasts a tried and tested kinematic structure with five linear axes. With its spindles, that can reach a power of over 10.5 kW both during main and back machining processes, and its bar capacity of 25.4 mm, the Swiss DT 26 proves to be an extremely efficient means of production. The Swiss DT 26 is no longer restricted to mere turning and milling tasks, but can be equipped with various tool holders. Schaller is thus well-equipped for a wide variety of requirements. By default, the machine is equipped with four radial drills for main machining. This provides Schaller with the required flexibility. The latter is further increased by the possibility of using a thread whirling head or a polygon milling head. With these two devices, the Swiss DT 26 is able to machine even the screws of the buttons or to be used for face milling processes without any problems. The thread whirling head can be inclined by +/-15° and achieves speeds of up to 5000 rpm for a maximum machining diameter of 10 mm. The polygon milling head as well rotates at a maximum speed of von 5000 rpm, while its diameter is 80 mm.

Only positive experiences

Asked whether they regretted the decision in favor of Tornos, Dr. Bünning and Dominik Weininger answered with a firm 'no'. The machines are running 24 hours a day and five days a week with absolute reliability and, overnight, they are largely used in unmanned operation. The machines are highly appreciated by the employees working in the turning shop and according to both interlocutors, this is due to the machines' ease of programming and operation. Two further aspects that Dominik Weininger regards as positive are the extremely short cycle times and the high responsiveness of the Tornos Service. Dr. Bünning concludes: "In the high-wage country Germany, there is no chance for us to win the price war. We will only remain competitive if we manufacture innovative products of highest precision and continuously enhance our production processes." With Tornos being its partner, the company sees itself excellently positioned to meet these challenges and will continue to inspire guitar players all over the world also in the future.

schaller.info

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HAROLD HABEGGER

A certified second-hand Tornos machine?

No problem!

We have already presented the Tornos machine overhaul service on numerous occasions. Making use of this service, customers who own a Deco, MultiDeco or SAS machine can benefit from a customized overhaul offered by the original manufacturer.

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At present, this service is highly appreciated by the Tornos customers. The customer gets the performance of a new machine at a competitive price. Today, we would like to discover another less known service, used or second-hand machines. It is actually possible to purchase a second-hand machine that has been overhauled, inspected and certified by Tornos. We met Matthias Damman, Head of Tornos Service.

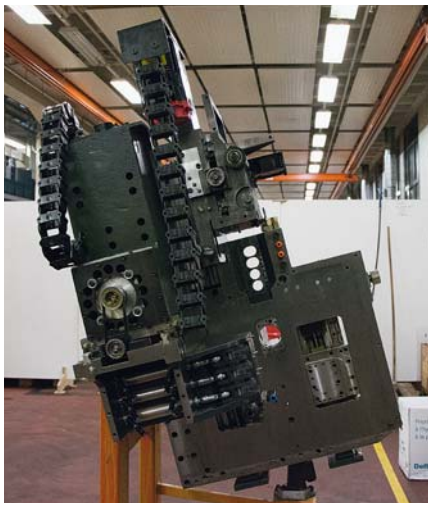
decomagazine: Mr. Damman, why should one offer such a service?

Matthias Damman: *First of all, there is definitely a market for used machines and we are convinced of that. As a manufacturer, we are predestined to offer such solutions. Furthermore, today's market is highly demanding in terms of delivery deadlines and quality. Sometimes, it is therefore advisable to be able to offer a fast alternative to new machines – with a second-hand machine that is soon available.*

dm: There are already numerous service providers who offer this kind of service. What are the benefits of choosing Tornos for the customer?
MD: We know our machines inside out and we know the history of each machine. We know which items should be inspected on each individual machine. We have a large stock of spare parts just a few yards away from the workshop where we prepare these second-hand machines. We are thus able not only to inspect the machines but also to carry out the required repairs and upgrades under optimum conditions. Many second-hand machine dealers do nothing else but resell machines while Tornos resells machines only after having inspected and reconditioned those using original parts to ensure they are in an excellent condition. Generally, we offer this service for Tornos machines only. For our own products, we can provide real added value. For obvious reasons, we prefer to let the established players deal with the machines of our competitors.

This Deco 10 will soon be inspected by the Tornos specialists for the purpose of its refurbishment.

In case of a complete overhaul, the machine is fully disassembled and reconditioned.



After more than 80,000 production hours, this Deco 10 will undergo a full overhaul before it will then be offered as second-hand machine. Despite the clearly visible ravages of time, the machine will leave the factory in Moutier in an as-good-as-new condition and continue to produce for many years to come.

dm: Tornos offers a large range of tool holders and attachments for its new machines, I suppose this also applies to second-hand machines?

MD: Absolutely! As far as the options are concerned, our customers will benefit from the same support and have the same possibilities as if they purchased a new machine. If a customer wants to install a high-pressure pump or a chip conveyor or if he requires advice concerning the tool holders, we will be pleased to help. We also have peripherals in store and we can install new peripherals without difficulty as well.

dm: Do you also offer warranty?

MD: Yes, we provide a warranty of at least three months on our second-hand machines as of the date at which the machines have passed the inspection in our workshop. For any new parts substituted in the course of the overhaul service and in case a machine has undergone a "factory overhaul", we offer a one-year warranty, i.e. the same warranty we provide for a new machine.

dm: Does this service also concern multispindle machines?

MD: It concerns any Tornos machine, both single and multispindle lathes. The actual stock depends on the sales and purchases we make. At the moment, we e.g. have one Swiss ST 26 machine, two Deco 20 machines, one Deco 26 and one Deco 13 in store. The stock varies greatly, we are constantly looking for new machines. I would like to take the opportunity to ask anyone who wants to part with one or several of his used Tornos machines to contact us. The current stock of second-hand machines can be checked up on our website https://www.tornos.com/en/content/used-equipments-listing

dm: What should you do if you are interested in buying or selling a machine?

MD: This is quite simple. Our sales and service teams are at your disposal; you can also contact me directly under the following e-mail address revision@tornos.com

tornos.com

"Due to the high demands on the quality of the fittings, we manufacture them largely in-house"

Edgar Segessenmann

CABRILLANT AG:

High productivity, ease of operation and good support

Experiences of a bar-turning shop with a Tornos Swiss-type automatic lathe

Cabrillant AG is a manufacturer of high-quality glass partition wall systems for the interior use in public buildings such as shopping centers, swimming pools or airports. Since such partition wall systems require numerous metal fittings, an own mechanical manufacturing workshop equipped with milling centers and lathes was established. From the initial bar-turning shop, a state-of-the-art center of excellence evolved that utilizes 65-70% of its capacity for orders from the free market. To replace another machine at the turn of the year, the company purchased a Tornos Swiss-type automatic lathe CT 20 for the first time. We talked to the responsible manager.

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"Our main products are aesthetically pleasing partition wall systems made of toughened safety glass for commercial and public buildings," Edgar Segessenmann, Managing Director of Cabrillant AG in Chur (Switzerland) declares. Such partition wall systems are used in lobbies of public buildings as well as for cubicles or lock boxes for changing rooms, shower rooms or bathrooms. To date, already more than 15,000 buildings – hotels, administration buildings, thermal spas or schools – have been equipped with such partition wall systems.

In Switzerland, the family-run, medium-sized enterprise is technology and market leader in this field. Via a network of partners and representatives, it supplies

Brightly colored instead of boring: glass partition walls for public buildings

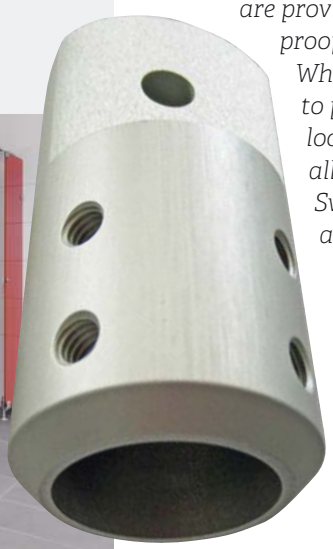
For 50 years now, Cabrillant has been furnishing public and commercial buildings with brightly colored, sturdy and easy-to-clean partition wall and door systems made of high-quality coated safety glass. Since the father of the present Managing Director entered the company as Technical Manager in 1972, the development of the company, that has seen several changes in name and ownership in the course of its history, has always been closely connected with today's owning family Segessenmann. Today, Cabrillant provides the domestic market as well as Austria with complete equipment including project planning itself and supplies its partners throughout Europe and in the U.S.A. predominantly with fittings, connecting components as well as locks and other accessories as complete sets. The latter include all required parts down to screws and washers which enables the craftsmen involved to fully concentrate on fast and efficient assembly.

Brightly colored, hygienic and durable. (Foto: Cabrillant)

customers throughout Europe – in particular in Germany, England, Sweden and Spain – as well as in the United States with its products. The partition walls consist of colored, non-transparent safety glass, the panes of which are complemented by high-quality metal hinges, fittings and locks to form full functional units. They are installed in buildings as turnkey solutions. Besides the aesthetical upgrading of the building, sturdiness and easy cleaning are the main advantages of the glass partition walls; these features are due to the enamel layer melted into one side of the glass pane that makes the walls highly resistant and scratch-proof. Even wanton contamination or spray layers can be removed completely and with ease. Besides toughened glass, laminated glass types are available as well; the colors can be chosen from a color chart or even selected freely.

Sophisticated fitting systems...

"One of the main advantages of our partition wall system is its high quality," E. Segessenmann adds. Owing to the smooth surfaces, dirt and bacteria cannot stick to it, so cleaning is a breeze. In this regard, the fitting systems are of particular importance; they fasten the glass pane in a way that no "dirt traps" can form between floor and glass pane or between the individual components of the cubicles. The individual glass panes and other components are thus virtually "floating" at defined distances to the adjacent panes and components and do not have any contact with the floor nor with other walls. As regards the fittings, they consist of non-corrosive metals, particularly aluminum or stainless steel. The aluminum parts are provided with a highly durable and scratch-proof surface through anodic oxidation. While many of Cabrillant's partners tend to purchase the heavy glass components locally due to the high transport cost, all metal fittings are manufactured in Switzerland as a matter of principle and are used by all partners.



The fittings are made of corrosion-resistant materials as is the case for the anodized aluminum component with matt finish shown here. (photograph: Klaus Vollrath)

… with a high level of vertical integration

"Due to the high demands on the quality of the fittings, we manufacture them largely in-house," E. Segessenmann reveals. For this purpose, Cabrillant runs its own mechanical production plant, fully equipped with milling centers, automatic lathes, automatic sawing machines as well as a mass finishing system by Trowal which is used to deburr the machined parts and to provide them with a satin matt finish. A broad range of materials, from plastics and non-ferrous metals to steel and stainless steel, is machined. The finished and coated parts are assembled to complete sets that comprise everything the fitter needs at the installation site to be able to do his work quickly and efficiently. For its systems, Cabrillant offers a lifetime spare parts warranty.

High-performance bar-turning shop

"Since our systems are highly productive, we cannot utilize them to their full capacity with our own production," Martin Wonneberger, multi-disciplined engineer at Cabrillant adds. Since the division developed from the successive acquisition of former suppliers, the customers of the respective companies were taken over as a part of the acquisition from the very beginning and are now attended to by Cabrillant. Since these activities have been consistently expanded over the years, sub-contract manufacturing for other customers has reached a share of about 65-70% of the total sales by now. The company benefits from this in two respects: On the one hand, it is ensured that productivity and quality and hence the competitiveness of the division fully come up to the current

With its 26 tool positions, the new CT 20 tackles more complex machining tasks and is suited for unmanned operation. (photograph: Klaus Vollrath)

"Our division has to attract two thirds of its sales by accepting external orders from the free market"

market expectations. On the other hand, the division achieves important contribution margins and, at the same time, expands its range of products and services offered in new market segments. The company thus contributes significantly to securing its future.

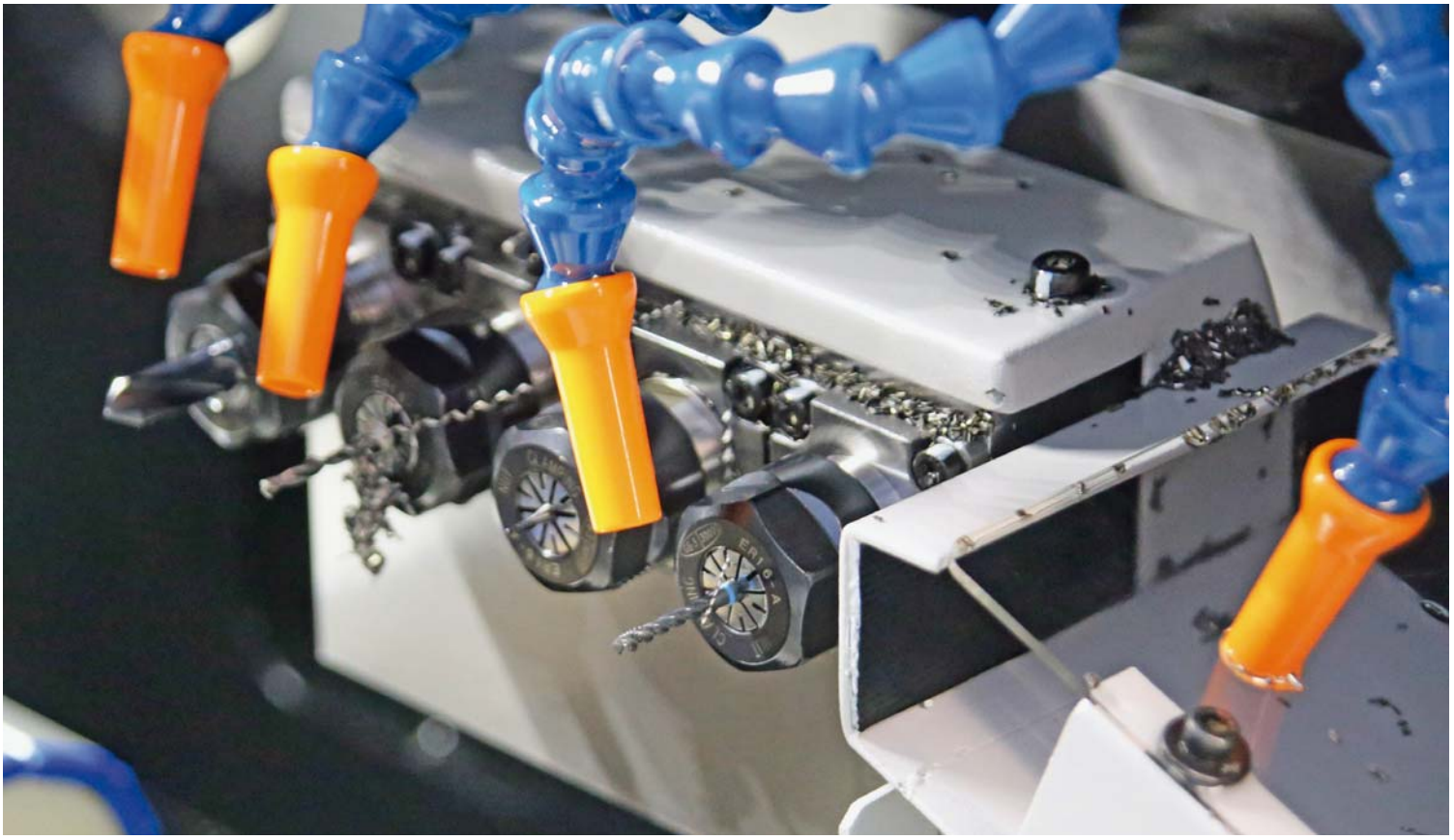
The new Tornos automatic lathe...

"In late autumn of 2017, we had to discard one of our older automatic lathes and looked for a state-of-the-art solution," Mr. Wonneberger says. As is usual in such cases, Cabrillant has scrutinized the offers of various manufacturers, asked its partner companies and customers about their experiences and even visited the suppliers or their Swiss representations. The company finally opted for the Tornos model CT 20 that proved to be the most suitable offer for a number of reasons. This machine is a Swiss-type automatic lathe with a bar capacity of 20 mm and a total of five axes as well as 26 tool positions. Four of the radial tools can be driven; the same is true for two front tools and one rear tool. With the cut-off workpiece clamped, the counter-spindle can move to the rear tools which enables the part to be clamped simultaneously in both spindles. Equipped with the appertaining bar feeder, the system is suited for unmanned operation even overnight.

... impresses through price, quality...

"We were particularly impressed with a visit of Tornos' manufacturing plant in Moutier," Mr. Wonneberger recalls. There, they could assure themselves that this manufacturer produces the quality-influencing core components of his technology himself – in accordance with Swiss quality principles. This means as well that sufficient service personnel knowing the systems off pat is available. If service is needed, assistance is provided by a competent service technician. With other suppliers – most of them distributors without in-house production – such experts are not nearby but often several hundred km or even more than 1000 km away. This inevitably has consequences as regards service and support. Furthermore, the Tornos machine was amazingly well-priced. The bottom line is that the fully equipped machine was only a shade higher in price than the basic version of comparable competitive products. Another important aspect was the term of delivery: In contrast to other suppliers, Tornos was able to supply almost from stock so that major bottlenecks could be avoided when the previous system failed.

Look at the materials store for the bar-turning shop (photograph: Klaus Vollrath)



The CT 20 has a total of 26 tool positions. The four tool positions for back machining are shown here. (photograph: Klaus Vollrath)

... and service

"We are also most satisfied with the service provided when we purchased and commissioned the new system," Mr. Wonneberger declares. The training for the new system was given directly at the manufacturer's plant. This enabled rapid commissioning after the delivery of the new system. The TISIS programming system as well boasts high ease of operation and e.g. enables libraries, once they have been created, to be transferred from the running program to the next one. Programming, which also includes a 2D simulation, can be done off-line at the PC. Here as well, timing information is available already during programming. Even after commissioning, Wonneberger was supported for more intricate tasks such as coupling the bar feeder; proficient contacts persons provided fast and efficient help. "We already had to call the hardware service due to an early failure of the screen. Repair service was provided within one day.
Some of the other machine manufacturers can definitely take a leaf out of Tornos' books in this context," Mr. Wonneberger concludes.

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TISIS CAM AND MASTERCAM SWISS:

Gain time

through efficient control of all your Swiss-type lathes

TISIS CAM and Mastercam Swiss are software applications that enable bar-turning companies to generate the contouring points or the points of complex geometries precisely and with ease. Moreover, thanks to the close partnership between Tornos and Mastercam, the development of post-processors and the machine is synchronized. This means that the post-processors are available when new Swiss-type lathes such as the SwissDeco 36T are launched.

Mastercam

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Jean-Pierre Bendit, Managing Director

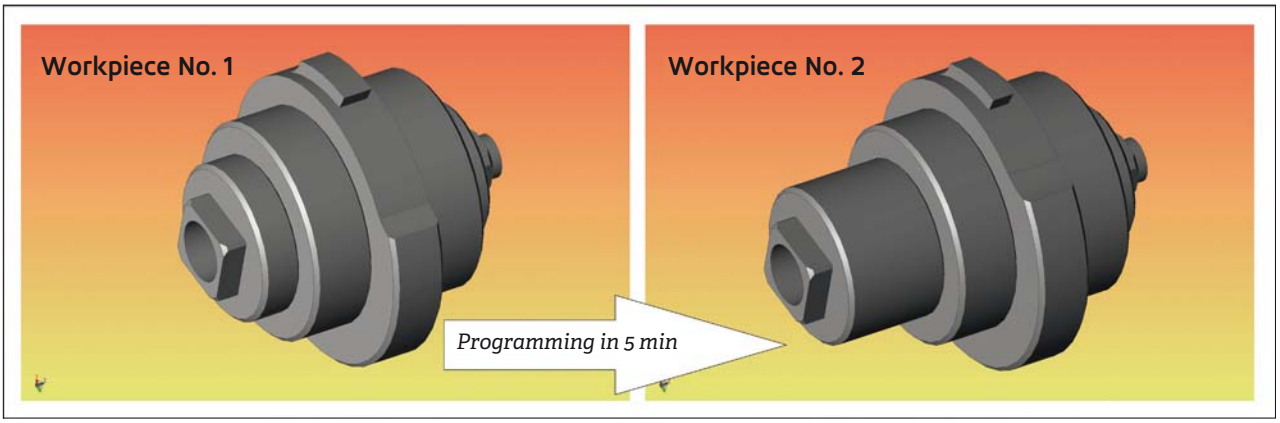
With TISIS CAM and Mastercam Swiss, set-up can be realized in record time

More than ever, every employee aims to save time during production, programming and set-up while having to guarantee impeccable quality. These objectives can be achieved with our applications. Programmers not working with CAM often pose the same question: how much time can I save by using your software as compared to the manual method? The answer to that is not an easy one and depends on various criteria, since every industry is faced with its own peculiarities. To enlighten anyone interested in CAM solutions in a simple yet vivid manner, this article presents the times required to finish 3 new parts based on 3 projects from 3 different industries - the watchmaking sector, the medical and the connector industry. The aim is to use TISIS-CAM or Mastercam Swiss that both allow the knowledge of the user to be harnessed, i.e.:

- *machining sequence patterns*
- *library of the existing tools*
- *replacement of the 3D model in an existing program*
- *intermediate parts (supplementary 3D model embedded in an existing program)*
- *default values in the operating parameters.*

For each example, please find below information on the differences between the base part and the part to be programmed, the method used and the time required for programming. The procedure to open the base part for code generation is described as well.

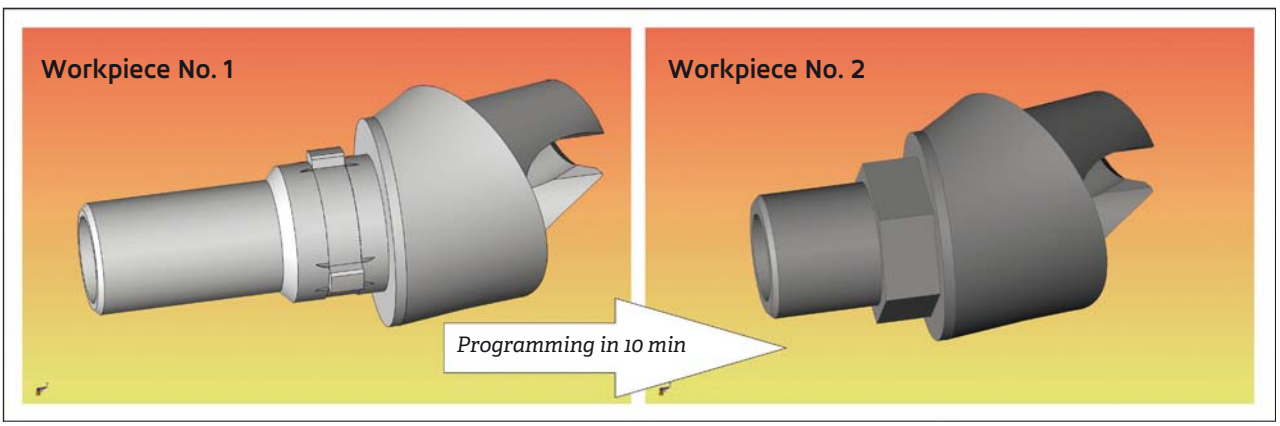
Example from watchmaking: programming of a new barrel arbor



Modifications of the new part include several longer turned sections and different contouring at the face of the hook (radius, position).
Method used: replacement of the 3D model.
Time required to generate new NC codes (ISO, TISIS-CAM or TB-Deco) is 5 minutes.
How much time is needed with the manual method?

For this example, the 3D model of workpiece No. 2 has replaced workpiece No. 1 in the same machining sequence. For the complete program required for the new workpiece, only new geometries had to be selected.

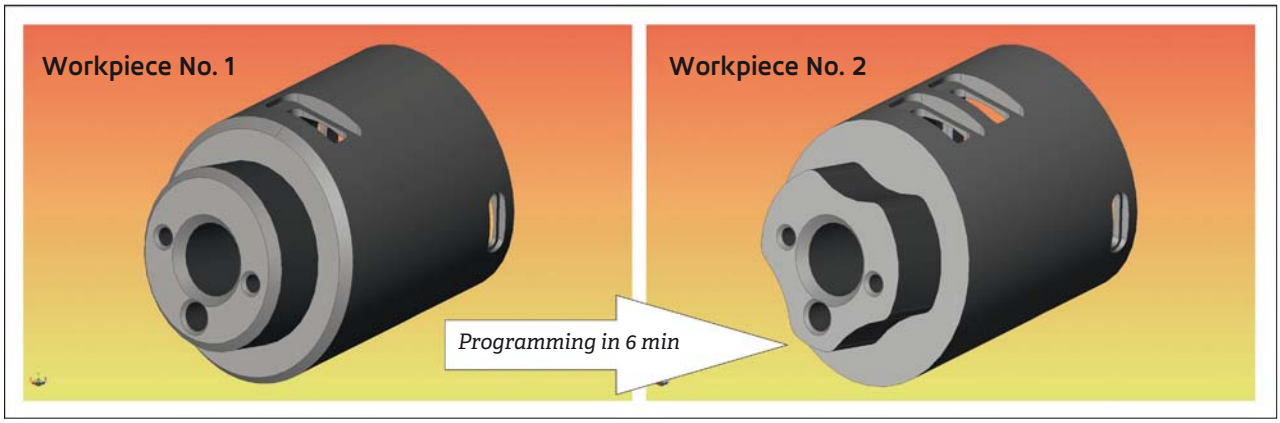
Example from medical industry: programming of a new implant



Modifications: different shank dimensions and an angle in 5 axes plus a shape offset.
Method used: machining sequence patterns and tool library.
Time required generating new NC codes (ISO, TISIS-CAM or TB-Deco): 10 minutes.
How much time is needed with the manual method?

For this second example, the tool libraries and machining sequence patterns created based on the first workpiece were used. The main difference is the re-definition of a new machining strategy for the workpiece shank. The easiest solution is to recreate intermediate parts.

Example from the connector industry: programming of a new mechanical component with inclined face



Modifications: different contouring on front and rear faces, pocket on top surface duplicated, chamfers not drawn.
Method used: use of an intermediate part.
Time required generating new NC codes (ISO, TISIS-CAM or TB-Deco): 6 minutes.
How much time is needed with the manual method?

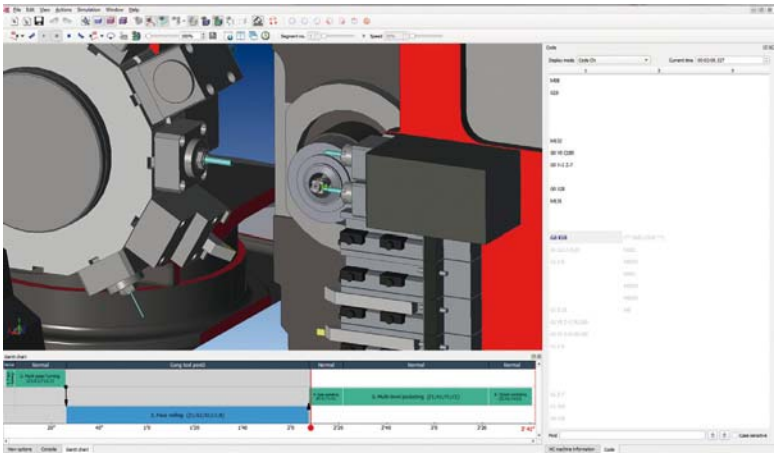
In this example, the workpiece is roughly identical as far as the dimensions and the machining strategies are concerned; only 4 operations are different. The most efficient solution is the use of an intermediate part that is only used to describe the modified operations.

Swiftness and benefit from existing expertise

For any new project, the user never starts from a blank page and the various presented functions are a means to save programming time. This has the following advantages compared to manual programming:

- *no risk of faulty coordinates (typing errors); the program is automatically created with the correct words and codes based on the workpiece geometry. There is no need for the user to worry about whether machining should be performed with G02 or G03 or whether the values should be positive or negative.*
- *possibility of completely simulating the program prior to set-up on the Swiss-type lathe with interference and tool path deviation control*
- *use of a validated process in order to better take advantage from the company's expertise*
- *machine-type specific synchronization and restriction management*
- *automatic generation of workshop documentation linked to the program*
- *fast exploration of machining options and space requirements of the tools*
- *automatic calculation of the approximate machining time for the workpiece*

“With TISIS CAM and Mastercam Swiss, set-up can be realized in record time”

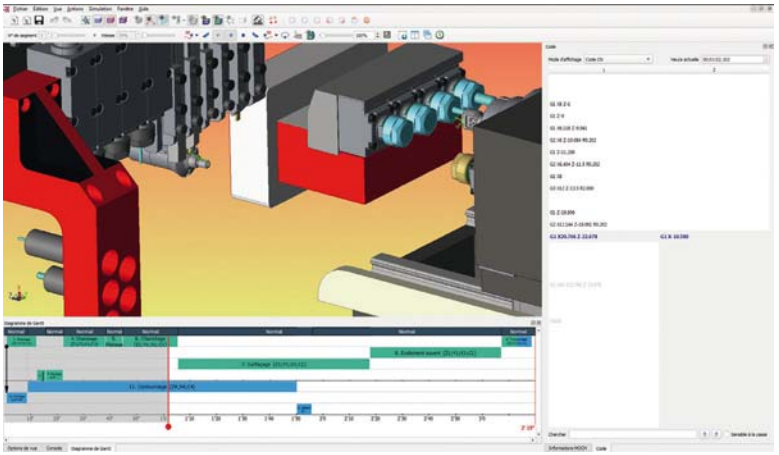


Complete control of SwissDeco 36T with turret.

Swiss-type lathes already supported by TISIS CAM and Mastercam Swiss

Based on the partnership between Tornos and Mastercam, high-quality machine environments with extremely accurate kinematics and post-processors can be offered. Since the market launch of the new Swiss-type lathe models by Tornos, TISIS CAM and Mastercam Swiss have been available for machine control. In fact, the development of the post-processors and of the new machine is synchronized in Tornos’ workshops.

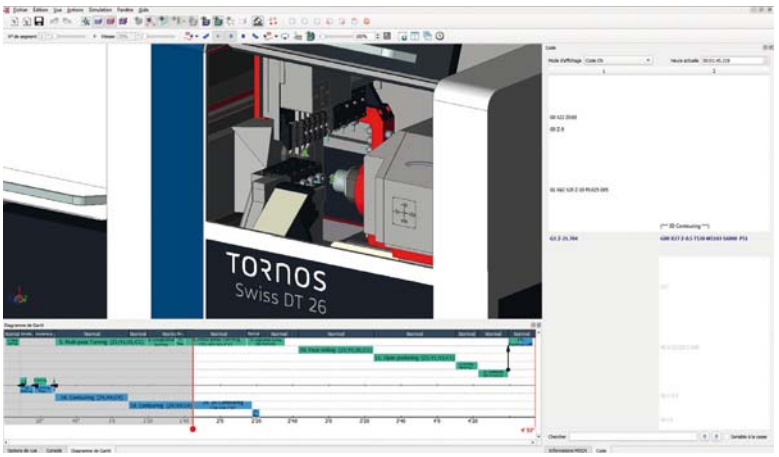
In addition, Mastercam Swiss enables fast passage from the programming of a workpiece on one machine to the programming on another machine, no matter whether programming is supported by TB-Deco (PNC or PTO), ISO or TISIS. While doing so, the kinematics and the tools of the machine are taken into account.



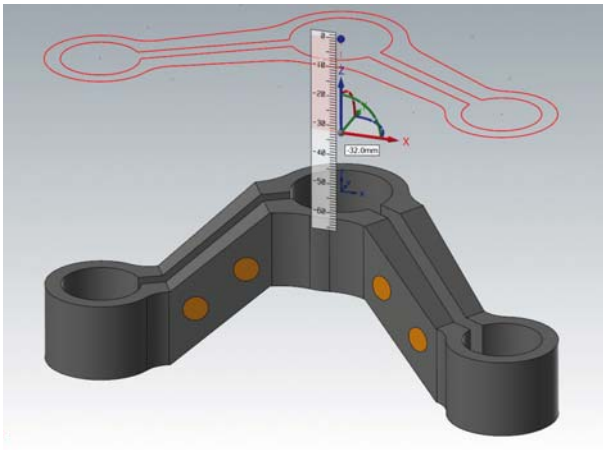
Tornos CT 20

Mastercam Swiss 2019 integrated with Mastercam Design CAD system

This summer, Mastercam Swiss 2019 will be launched. Many simplified and enhanced functions are offered, with a particular focus on the integration with Mastercam Design. This Mastercam CAD module enables both the full creation of 2D or 3D model and the utilization and modification of existing models coming from various interfaces (for ACIS, Parasolid, STEP, Creo, etc.).
Mastercam Design, the ideal CAD system for workshops – for intuitive and efficient operation



Tornos Swiss DT 26



Mastercam Design, the ideal CAD system for workshops – for intuitive and efficient operation.

Workpiece modifications e.g. enable the following to be done:

- *modeling a 3D model based on a dxf file*
- *filling a hole or other geometry*
- *adding an allowance or features to ensure average rating*

Mastercam: 35 years of experience in machining with a global network of skills

When selecting Mastercam, you do not only select a CAM software vendor, but the product family used most throughout the world. For 23 years, Mastercam has been the leading CAM solution with more than 500 dealers in more than 75 countries. Mastercam's huge success can also be traced back to the synergy between the dealer's skill sets and the customer's requirements. Owing to the importance of the market, CNC Software, the provider of Mastercam, built a Competence Center in Switzerland with the further technological development of Swiss-type lathes in mind.

In particular, the Mastercam family comprises:

- *Mastercam Design (3D CAD)*
- *Mastercam Mill (milling)*
- *Mastercam Lathe (turning)*
- *Mastercam Wire (wire EDM)*
- *Mastercam Swiss (bar turning).*

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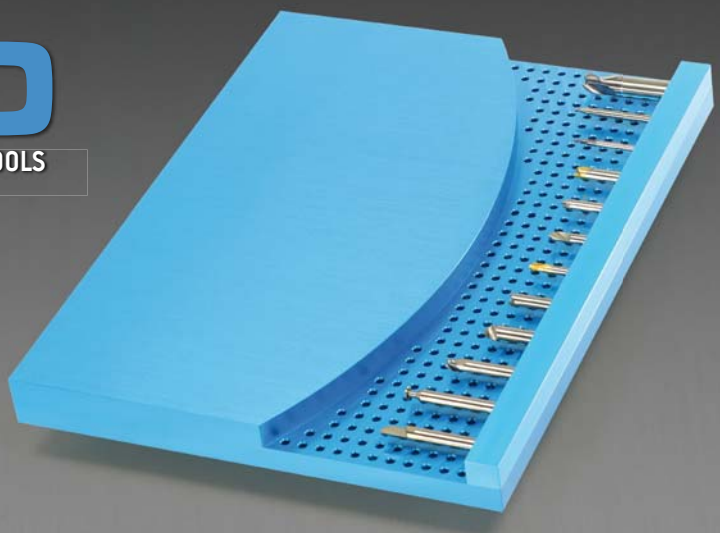

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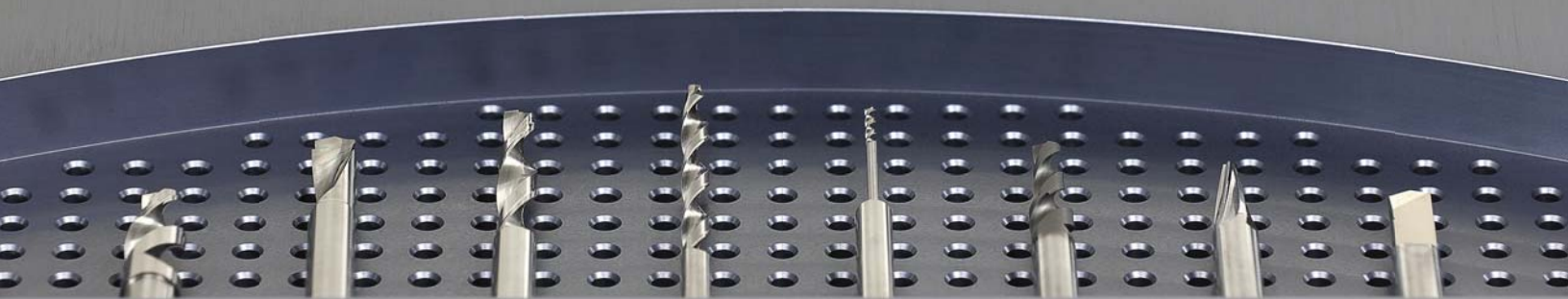

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Specific developments for

customized solutions

Tornos is one of only a few single-spindle and multispindle lathe manufacturers that runs its own department for specific developments. This enables Tornos to customize machines to the specific requirements of the customer.

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This department is staffed with engineers working hand in hand both with the customers and the machine designers in order to guarantee the perfect integration of the offered solutions in terms of the mechanical design as well as the electrical system.

The engineers have to tackle a very broad range of demands that pose a real challenge. Today, we would like to discover an exceptional solution that complements the range of part outlet solutions for the MultiSwiss brand: our workpiece lift. This solution is intended for external installation and can be adapted to other machines according to the specific requirements.

A team for extraordinary challenges

"We are used to receiving any type of demand. Sometimes, the demands are a bit off the beaten track; this also applies to this solution which was elaborated based on the customer's wish to transport his workpiece to a height of 1 m in order to be able to post-treat it in an automated washing tunnel," Fabien Chaillet, responsible manager for specific

developments at Tornos, emphasizes. He continues: "There is always a multitude of technical solutions; our role is to find the solution that offers customers the best value for money. And that's why – after an extensive examination of various solutions, including especially 6-axis robots – we finally decided on the development of our own cell to be able to stay within the customer's budget and to keep pace with the production rate of a multispindle lathe."

A cell designed with the machine in mind

The current cell has been designed for handling workpieces with a diameter of 8 mm and a length of 30 mm. However, upon appropriate studies it may be adapted to workpieces of other diameters and lengths. It has a programmable discharge height between 550 mm and 1000 mm and its total dimensions are 800 mm x 750 mm x 1540 mm.

Designed for MultiSwiss 6x16, the lift can also be adapted to other products upon appropriate studies

A special part lowering device has been designed to prevent the workpiece from turning over. It thus arrives under optimum conditions for the gripping process. This system has been customized for the workpiece to be handled. "To successfully manage this stage, an excellent knowledge of the machine is required," Fabien Chaillet points out and he adds: "In such cases, it's our team that makes the difference." By means of a conveyor belt, the workpiece is then transported to the gripper. If required, it is also conceivable to add a supplementary turnover station (for turning the workpiece by 180°).

As soon as it has been gripped, the workpiece is transported to the programmed height and deposited in a pallet. It can also be transported to another peripheral system (such as a washing tunnel). The gripper jaw is manufactured by stereolithography to make sure it perfectly matches the shape of the workpiece without damaging it.

It goes without saying that the device is absolutely safe and enables easy access to various systems through an access door. The part pick-up system can thus be easily replaced. The cell is equipped with its own display unit that shows the cell status. The cell is connected to the machine and to the peripheral systems intended for subsequent processes. If a problem were detected at the cell or at the treating peripherals, the cell would instruct the machine to stop the production.

In this case, the machine would enter the "without material" mode to prevent the temperature from dropping and, above all, to make sure production can be restarted soon once the problem has been resolved.

An alternative suited to high production rates

The new cell is an affordable alternative to a 6-axis robot cell. It can easily be adapted to various kinds of workpieces and, thanks to its high speed, it can cope with high production rates.

For further details, do not hesitate to contact your Tornos representation. Fabien Chaillet concludes: "Our team of engineers enjoys challenges. They will be pleased to develop new and customized solutions for you."

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TENABLE SCREW CO LTD:

Tenable turns to MultiSwiss *for productivity*

Almost 78 years after Tenable Screw was founded by a Swiss watchmaker as a manufacturer of screws, the company has become one of the UK's largest subcontract manufacturers of turned parts. Remaining deeply loyal to its roots, Tenable has unparalleled expertise in turned component production, something that is evident by the company's relentless growth.

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With three manufacturing sites in Marlborough, Coventry and its headquarters in Wimbledon, South London; Tenable has more than 250 machine tools that include 71 coil-fed Escomatics, 26 Multispindle machines, 56 sliding head turning centres and four fixed head turning centres. The machines produce millions of components every month. Committed to a culture of quality assured engineering excellence, Tenable Screw invests 10% of annual turnover in modern technology to support its live customer base of over 250 companies. Part of this investment strategy has seen the arrival of a Tornos MultiSwiss 6x14.

The modern face of Tenable Screw sees the company manufacture everything from connector pins and sockets through to bolts, screws and much more for the electronics, instrumentation & control, automotive, aerospace, medical, defense, transport and telecommunications sectors in quantities that range from prototypes and small batch production up to

100,000+ runs. With London property at a premium and a 45,000sq/ft Wimbledon headquarters packed with machine tools, the philosophy behind the MultiSwiss 6x14 purchase was to add flexibility and capacity to a business with limited floor-space. Commenting upon the arrival of the Tornos MultiSwiss 6x14, Tenable Screw Commercial Director Mr. Nigel Schlaefli says: "We initially acquired the MultiSwiss to alleviate capacity issues on our single spindle sliding head machines whilst having the production capacity of multiple single spindle machines in a floor area significantly smaller than 5-6 single spindle machines. Whilst we initially used the MultiSwiss as a flexible centre that was supporting our single spindle machines; like any subcontract manufacturer that has a fluid workflow, customer base and component types, the MultiSwiss is now dedicated to producing just one component family. Despite being restricted to a single family of parts, the productivity, precision, cost reduction and floor area benefits are evident."

Producing automotive components 6 times faster

Just a few months after installing the MultiSwiss 6x14, Tenable Screw won a long term automotive contract. The family of stainless steel pins require numerous external turning processes as well as knurling, drilling and parting-off. The UK contract requires 1,500,000 parts every year, a quantity equal to 30,000 parts every week. Tenable Screw trialled the automotive part on one of its sliding head turning centres and the cycle time was 1.5 parts per minute. In stark contrast, the MultiSwiss 6x14 was capable of producing 9 parts per minute – an output equal to 6 sliding head turning centres.

"We calculated that we would have needed to run 6 single spindle turning centres for 24 hours a day to meet the contract capacity level. We generally run our machines for 8-8.5 hours through the day and re-set the machines at the end of a shift to run for an additional 8-9 hours unmanned. To meet the demands of this specific contract, we would have had to commit

CNC manager Paul Kelley with commercial director Nigel Schlaefli.

The work envelope of the MultiSwiss with automotive components in each spindle.

“The MultiSwiss is achieving at least double the tool-life of the single spindle machines”

staff to running 6 sliding head machines around the clock. In comparison to the 24/7 running of 6 machines, the MultiSwiss 6x14 hits the same output by just running for 17-18 hours a day. This means we can run the machine during a day shift, change tools and re-stock the barfeed at the end of the shift and then run for an extra 8-9 hours unmanned,” says Mr. Schlaefli.

The quality benefits

As with all manufacturers with relentless quality standards, Tenable Screw has a dedicated quality control department and its production adheres to ISO:9001 2016. With regard to production, Tenable applies SPC and CPK procedures to its production. The CNC Manager responsible for more than 60 CNC machine tools at Tenable Screw, Mr. Paul Kelley comments: “If we were producing this automotive part on 5-6 machines there would inevitably be a variation in CPK values between the machines. Whilst the part has an average tolerance band of +/-20 microns, the MultiSwiss easily maintains a band of less than +/-10 microns and this improves our CPK and SPC values considerably.”
“What we have also found is that each spindle on the MultiSwiss works independently, unlike conventional multispindle or CAM-auto machines. This allows us to change the spindle speeds for each spindle and operation. This considerably improves surface finishes and contributes to improving tool life compared to other production machines.”

Hydrostatic spindle technology

Contributing to both quality and tool life is the hydrostatic spindle technology integrated into the Tornos MultiSwiss 6x14. As Mr. Kelley continues: “Over an extended period of time, roller bearing technology on machine tools will generate wear and this results in diminishing component quality. However, the hydrostatic spindle technology on the Tornos eliminates wear; this means precision and consistency will not diminish. The hydrostatic spindle also eliminates vibration in the spindle head and this enhances component quality and surface finishes.”

Referring to the tool life on the MultiSwiss, Mr. Kelley continues: “The MultiSwiss will run for two days without any need for tool changes. Even then, we are only changing inserts as a precautionary measure. The only tool we change on a daily basis is the knurling tool. To put this in context, we are producing 18,000 stainless steel parts before we change inserts. The MultiSwiss is achieving at least double the tool-life of the single spindle machines.”

Tornos reduces costs for Tenable

The MultiSwiss at Tenable Screw has demonstrated how it can reduce floor space requirements and reduce power consumption, tooling and general running costs compared to 5-6 single spindle machine tools with a comparable production output. The consumable costs are further reduced by the hydrostatic fluid technology, as Mr. Kelley continues: “The MultiSwiss uses the same oil throughout the machine. The hydrostatic spindle oil is also used to lubricate and cool the machine. The swarf conveyor in the machine base has 4 mm holes that filter the smallest chips and oil. The oil and chips are then filtered through 20micron filtration paper that collects all remaining swarf and particles. The oil is continually recycled through two further filters before returning to the spindle and machine envelope. We change the oil every 6 months on the MultiSwiss.

However, this continually filtered oil is of such a high quality that after 6 months of use, we then use it in our single spindle sliding heads as 'new oil'."

Ease of use

The MultiSwiss 6x14 at Tenable Screw has a FANUC CNC control interface that is particularly easy to use. Concluding upon the CNC control and the ease-of-use characteristics of the MultiSwiss, Mr. Kelley says: "The MultiSwiss has 14 linear axes and 7 C-axes with up to 18 tool stations. Despite the number of axes and tool positions, the machine is significantly easier to program than single spindle sliding head machines. We apply G-Code programming and determine the number of operations for each spindle. Combining these features with a well-lit and easy-to-access work envelope, the MultiSwiss is easier and faster to set-up than single spindle machines."

"This ease-of-programming is certainly beneficial; but one equally important factor is the operator. There is a distinct lack of skilled CNC machine operators and programmers in the UK. Combining the ease-of-use characteristics with the facility to be as productive as 6 alternate machines, the MultiSwiss reduces the reliance and requirement for highly-skilled staff; something that certainly suits our company in the face of skill shortages."

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TORNOS

MultiSwiss 6x32

The MultiSwiss 6x32 shares the same base as the MultiSwiss 8x26 machine. It is equipped with six independent spindles with hydrostatic bearings and can turn bars up to 32 mm in diameter. To achieve excellent machining conditions at these diameters, the 11-Kw motor has an increased torque of 27 Nm (S6). The maximum spindle speed is 6000 rpm and the maximum part length is 65 mm. As an option, the machine can also be equipped with three Y axes.

tornos.com

32 mm, 27 Nm, perfect for large diameters

MultiSwiss 6x32

We keep you turning