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*SwissDECO 36 TB:
the first bar
turning center*

15

*AMB and IMTS:
two major events*

28

*Slice Mfg. Studios:
Build it and
they will come*

40

*Ingun: Successful
throughout the
world thanks to high
precision*

47

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SUMMARY

- 4 Editorial – Discover our future-ready solutions at AMB and IMTS
- 9 MultiSwiss 6x16:
a new look for even better ergonomics
- 15 SwissDeco 36 TB: the first bar turning center
- 21 SwissNano's extraordinary capabilities up to Ø 7 mm
- 28 AMB and IMTS: two major events
Tornos pursues a single objective – providing the customers with even more efficiency
- 34 Mideos: the success of a dedicated team!
- 40 Slice Mfg. Studios: Build it and they will come
- 47 Ingun relies on the SwissNano
Successful throughout the world thanks to high precision



"Whatever your automation needs, Tornos has the solution."

Michael Hauser CEO, Tornos

Discover our future-ready solutions at AMB and IMTS

Michael Hauser **CEO, Tornos**

Manufacturing today stands at the dawn of a new era: Industry 4.0 — and, aligned with our brand promise, “We keep you turning,” Tornos’ is innovating as never before to help you leverage new capabilities to stay on pace as the future unfolds. Two upcoming major trade fairs — AMB 2018 in Stuttgart, Germany, and the International Manufacturing Technology Show (IMTS) in Chicago, US — are your tickets to discovering Tornos’ future-ready solutions.

AMB 2018

We invite you to meet us September 18-22 at our 200-square-meter AMB 2018 presence (hall 4, stand 4A11) to discover the many ways Tornos is innovating to position your manufacturing operation for the future.

One example is the brand new design of our MultiSwiss 6x16, now aligned with the rest of the MultiSwiss family in terms of ergonomic use. With the newly designed MultiSwiss 6x16, you get same world-renowned high performance — but with its improved ergonomics, this solution makes it easier for your machine operators to achieve that performance.

On top of that, the redesigned MultiSwiss features the new Tornos Control Panel (TCP) — the same one you’ll find on our new SwissDeco range of visionary, high-end bar turning machines. The TCP takes the complexity out of your operator’s job by including only the most essential touch points. Its software works exactly like smartphone software, so it’s in

line with Industry 4.0: intuitive to use, whether your operator is a tech-savvy millennial or an old-school machine operator.

And speaking of future-ready solutions, you won’t want to miss our new SwissDeco at AMB 2018. Introduced with excellent feedback at EMO Hannover 2017, the SwissDeco range has been extended to include the SwissDeco TB, featuring a turret mounted on a B axis to help you perfectly machine the most challenging parts. Representing Tornos’ vision of the workshop of the future, this range of machines also features our smart and intuitive TCP.

Furthermore, following the great success of our SwissNano 4, AMB 2018 is the place to experience our new SwissNano 7, with more capacity and more tools. Renowned as the micro and nano precision specialist, this premium solution puts you on the path to the future with its incredible ergonomics, superb kinematics, and precision-boosting thermostability. And while you’re visiting us, you’ll want to experience our Swiss GT 32 paired with a robot cell to store and load parts inside the machine. Whatever your automation needs, Tornos has the solution.

IMTS 2018

If you plan to be at IMTS 2018, September 10-15 at McCormack Place in Chicago (US), you’re in for yet another glimpse of the future of bar turning, with the debut of our SwissDeco G (platen version). At our booth in the south building (stand 339053), you’ll discover a solution equipped with a double



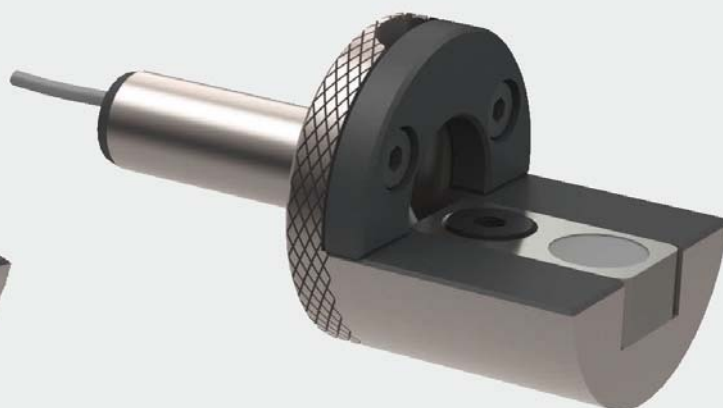
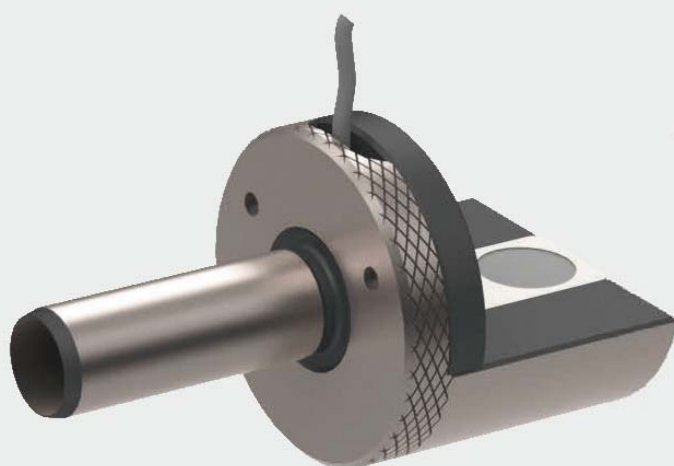
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platen and nine axes; the second platen is equipped with a Z axis to enable roughing/finishing operations, frontal operations and deep drilling, as well as work in differential mode. Like all four versions in the range, the SwissDeco G is equipped with our TCP.

Our IMTS guests can also get a first-hand-look at our latest-generation SwissNano, the Swiss GT 32, and our MultiSwiss 6x16 and MultiSwiss 8x26. Our all-star IMTS lineup can also be seen at the booth of our agent, Methods in the south building as well (stand 339119).

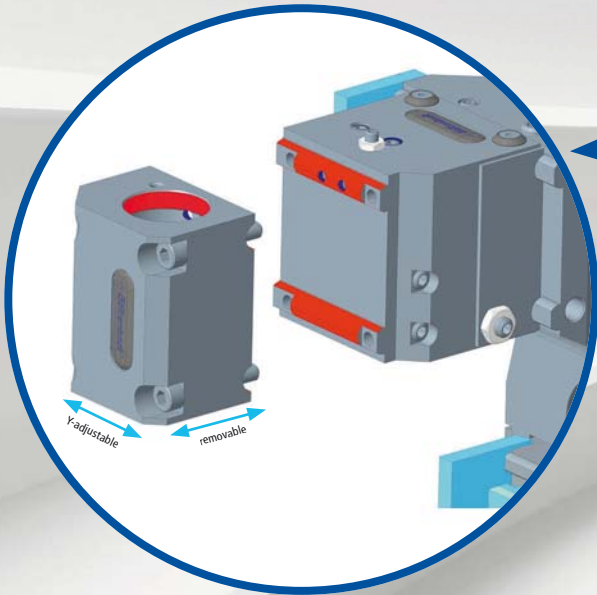
With all of these future-ready solutions, it's no wonder manufacturers worldwide "Turn to Tornos" for future-shaping single- and multispindle solutions as well as world-class training and services.

To illustrate my point, please find our new turning products brochure as well as our milling products brochure attached to this decomagazine. With these documents, you can see for yourself the vast range of our solutions. Whatever your request, do not hesitate to contact us.

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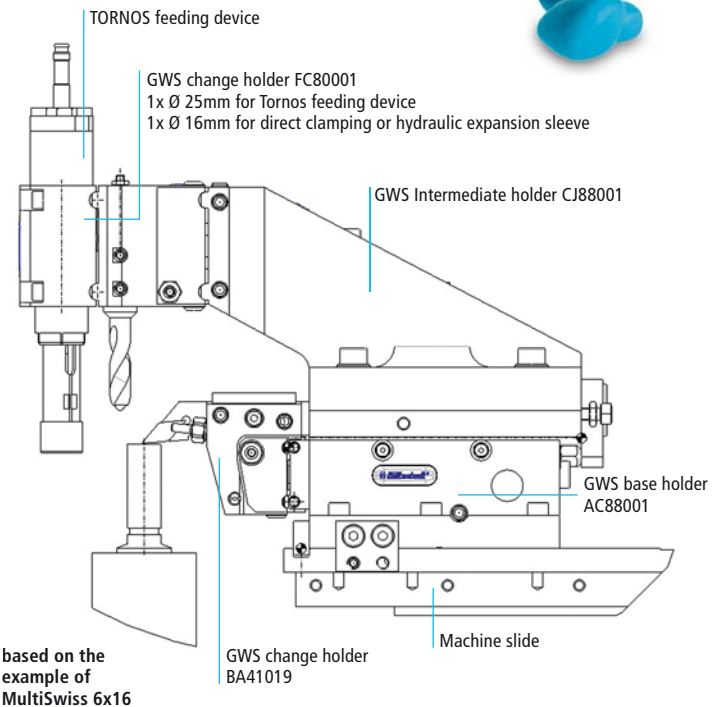


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MULTISWISS 6x16:

a new look for even

better ergonomics

MultiSwiss 6x16 is the multispindle lathe that sets the benchmark for the machining of small diameters.

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Since its market launch in 2011, it has experienced constant evolution and today, it is offered in a completely new design that largely resembles the design of the MultiSwiss 8x26 and MultiSwiss 6x32 machines.

Family resemblance for even higher efficiency

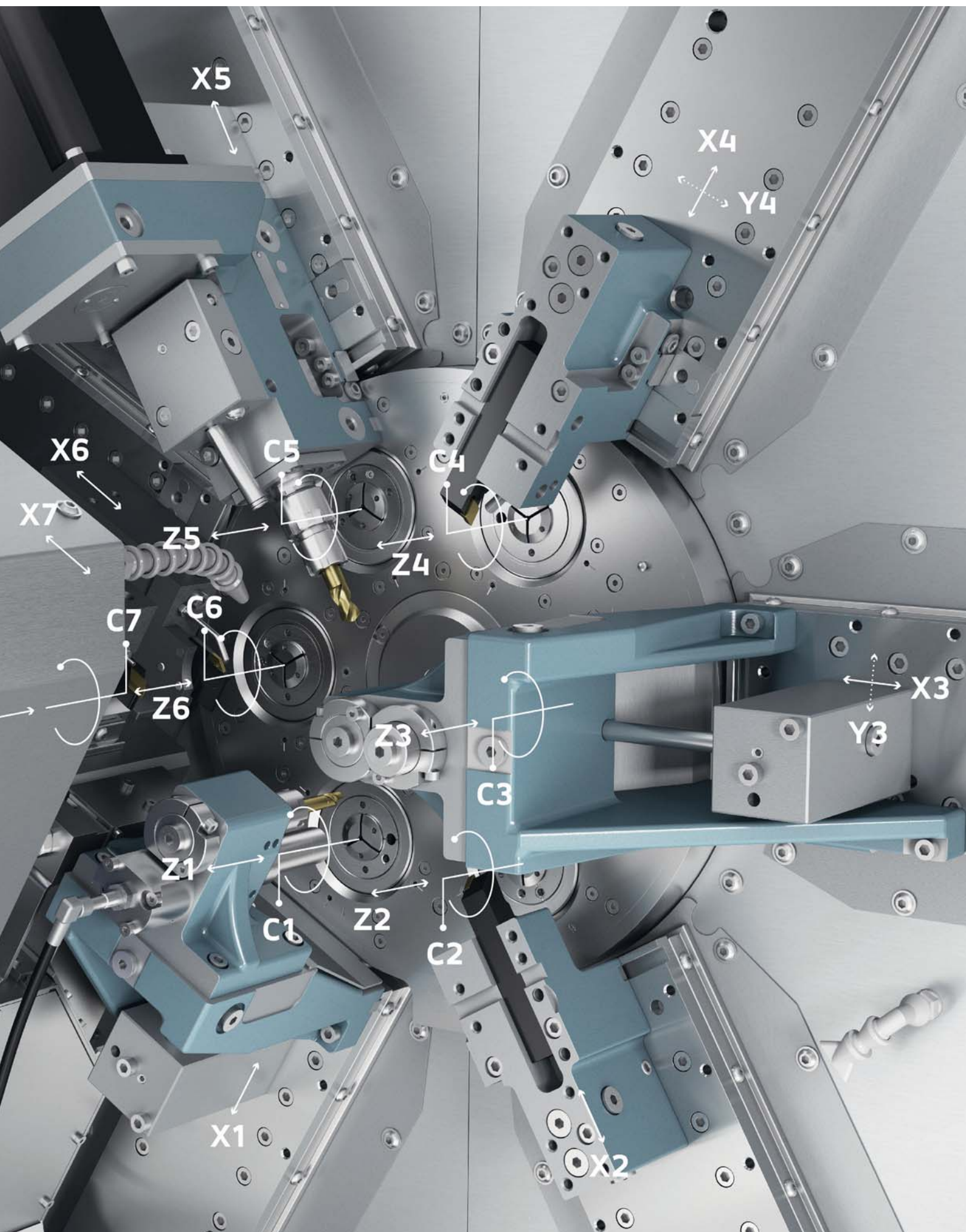
To this day, the MultiSwiss 6x16 has benefited from various improvements while retaining its original design. The machine now perfectly matches the new Tornos line-up and is equipped with the brand-new panel PC the SwissDeco is provided with as well. This powerful new control unit offers even higher ease of use and brings about considerable time savings for the users. The leak tightness of the machine and the entire ergonomics concept have been revised based on user experiences from all over the world. In this way, numerous details could be enhanced both on the machine and on the container. In doing so, Tornos has clearly aimed at making the MultiSwiss, a machine that is fun to work with and is both convenient and efficient.

A totally unique concept: less floor space required

The MultiSwiss machine is not just intended for traditional multi-spindle lathe customers, its technology is also suitable for bar turners who traditionally would have chosen an entry-level or mid-range Swiss-type lathe. In fact, the MultiSwiss machine can replace 4 to 7 Swiss-type lathes, while keeping a footprint that is comparable to a single Swiss-type lathe equipped with bar feeder. The floor space reduction can amount to more than 75%.



MultiSwiss 6x16 has 6 sliding headstock spindles provided with Z axis and its hydrostatic features ensure an incredible low tool wear.



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A totally unique concept: perfect homogeneity

As far as the operators are concerned, various companies entrust the same operators with the operation of both machine types. This is due to the similarity between the mode of operation and to similar tooling configurations. In the end, everything depends on the workpiece to be machined; with this machine, very low unit costs can be achieved while a very high machining stability is guaranteed. Such homogeneous production is of particular interest to the customers in the automotive industry. The parts machined on a MultiSwiss have a lower risk of dimensional variance because the parts in a series run are produced on fewer machines and by fewer operators.

A totally unique concept: integral means of manufacture for high productivity

The ease of machine control during production should also be stressed. Instead of 4, 5 or even 7 set-ups on Swiss-type lathes, a single set-up will suffice with the MultiSwiss. The same applies to production monitoring. Only one single production process needs to be monitored while several machines must be monitored if you opt for single-spindle machines. In plain language, only one single Gaussian curve must be monitored and not several, as is the case when producing parts on several Swiss-type lathes.

Optimised tool wear

MultiSwiss 6x16 has 6 sliding headstock spindles provided with Z-axis and its hydrostatic features ensure an incredibly low tool wear. As the cutting stress can be reduced through hydrostatic technology, wear can be reduced by up to 30%. But wear reduction is

not all. This technology enables the MultiSwiss to achieve an outstanding surface finish. Moreover, it should be pointed out that shaping tools are not necessary for the MultiSwiss, so that substantial cost savings can be achieved compared to a cam-type multi-spindle machine. Up to 18 different tool modules can be mounted on the gang-tool posts of the 7 machining axes. On each module, up to 3 tools – e.g. polygon cutting tools, front drilling tools and high-frequency drilling/milling tools – can be used. Optional quick-change systems are also available.

An all-in-one concept

The MultiSwiss 6x16 comes equipped with a peripherals container. This comprises all peripherals the machine needs for efficient production such as a bar loader, filter unit, heat exchanger, coolant system, high-pressure unit and more. It ensures an integral and compact design and helps to reduce the required floor space of this genuine integral production unit. Above all, the integrated peripherals have been perfectly dimensioned for the machine. The equipment of the MultiSwiss 6x16 machine also comprises various CNC software options as well as the Connectivity Pack.

Discover the new MultiSwiss 6x16!

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SWISSDECO 36 TB:

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The visitors of the AMB fair in Stuttgart, Germany, will have the chance to admire the new SwissDeco 36 TB.

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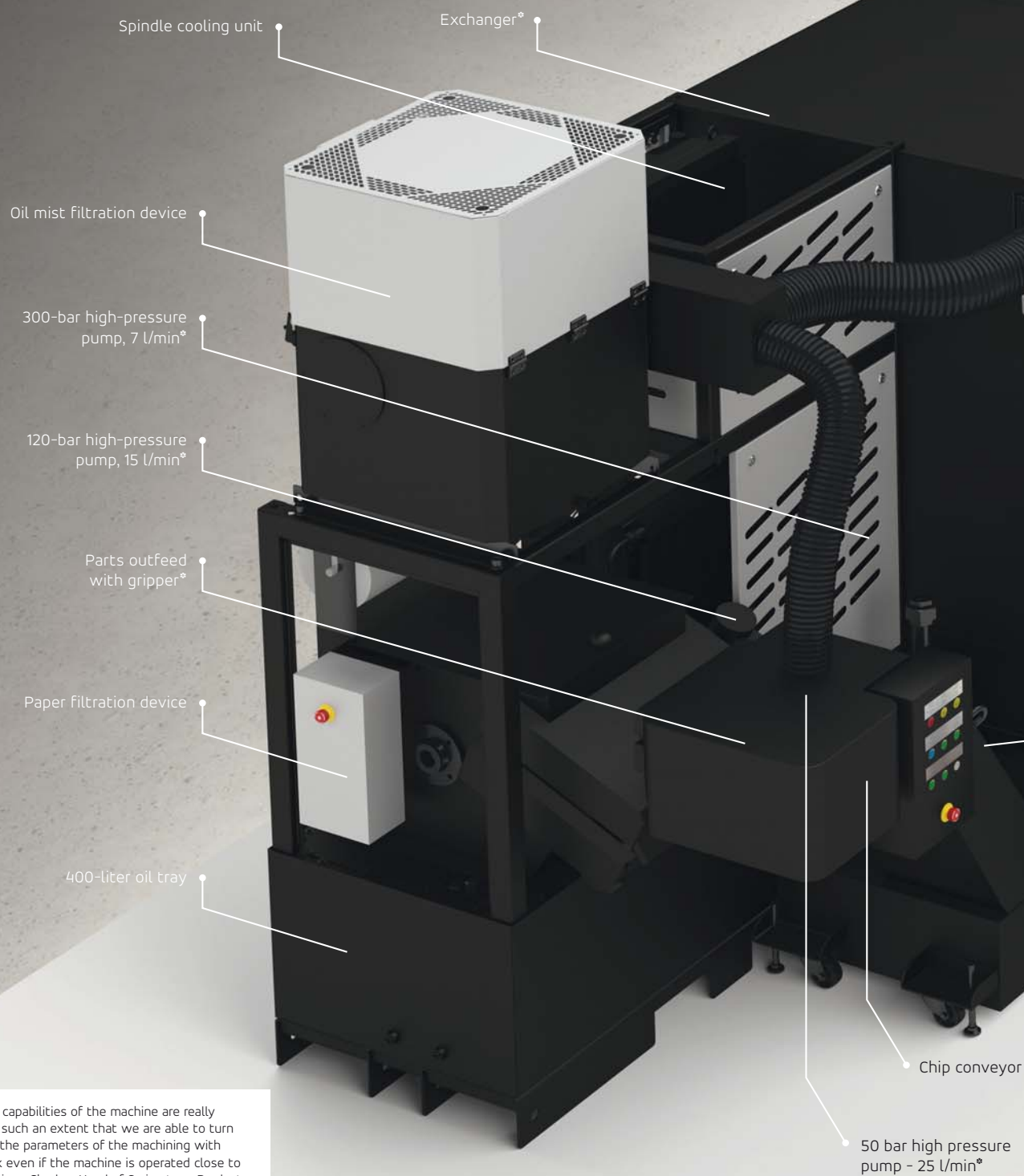
This machine is something between a bar-type machining center and a bar turning machine. This is the best proof – if any such proof were needed – of the fact that SwissDeco is not only a new product range but also at the top of Tornos' machine line-up.

An outstanding performance...

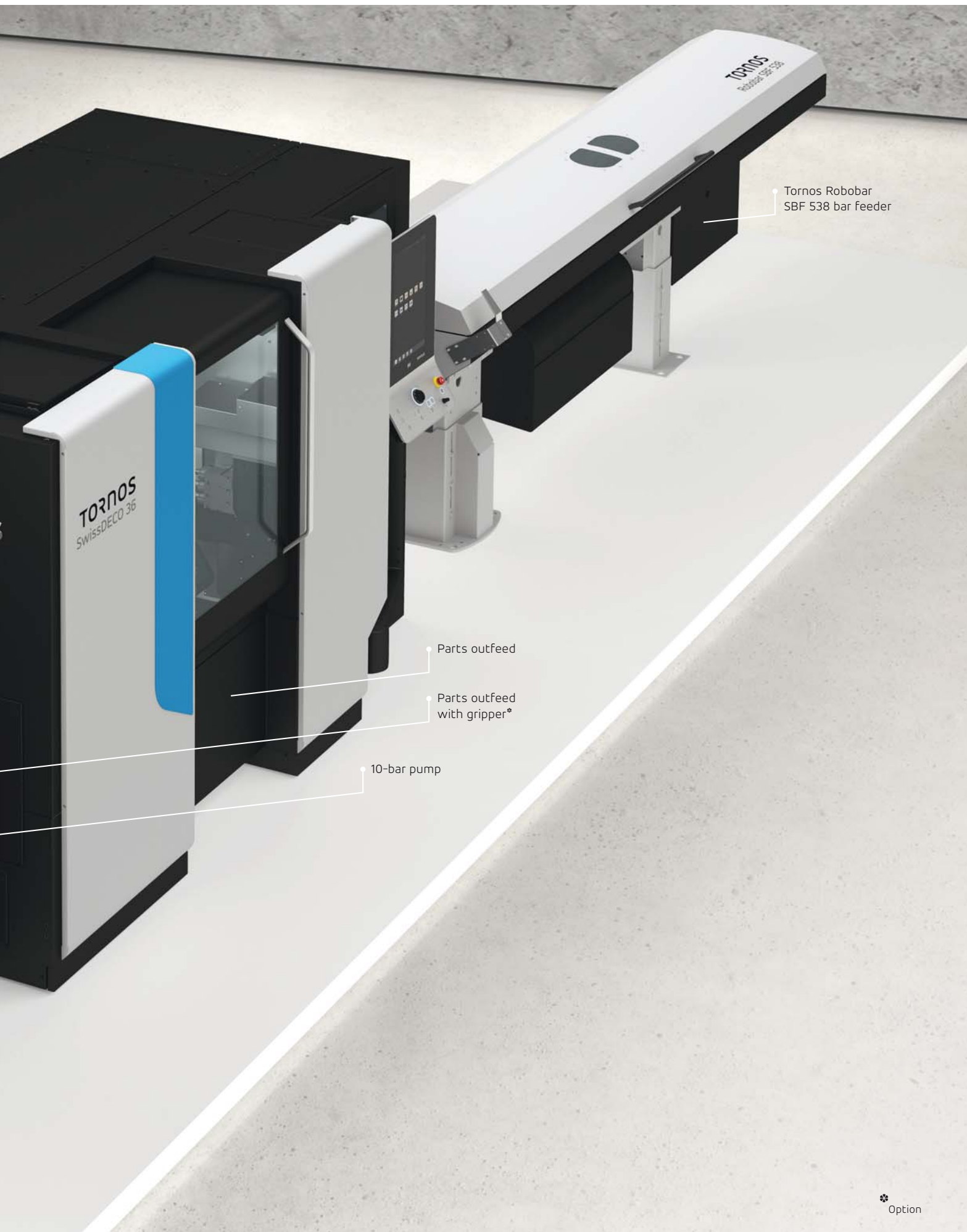
SwissDeco 36 TB is based on the same structure that is the hallmark of all models of the entire range: it has an ultra-rigid cast machine base equipped with extra-large guiding elements for the full potential of the machine to be tapped and spindles boasting very high power. All these aspects in combination make the machine withstand high machining loads even when machining the toughest materials. "With SwissDeco, we wanted to design a machine without any compromise," explains Philippe Charles, Head of Swiss-type Product Management at Tornos.

... rounded off by comprehensive equipment

The machine can be equipped with 57 tools including 36 driven tools. "Today, a Swiss GT-type machine as well is equipped with a B axis and a number of tools that is quite impressive, even if it has fewer tools than SwissDeco. But now SwissDeco opens up a new



"The machining capabilities of the machine are really impressive – to such an extent that we are able to turn parts based on the parameters of the machining with fixed-headstock even if the machine is operated close to its limits." – Philippe Charles, Head of Swiss-type Product Management at Tornos.



Tornos Robobar
SBF 538 bar feeder

Parts outfeed

Parts outfeed
with gripper*

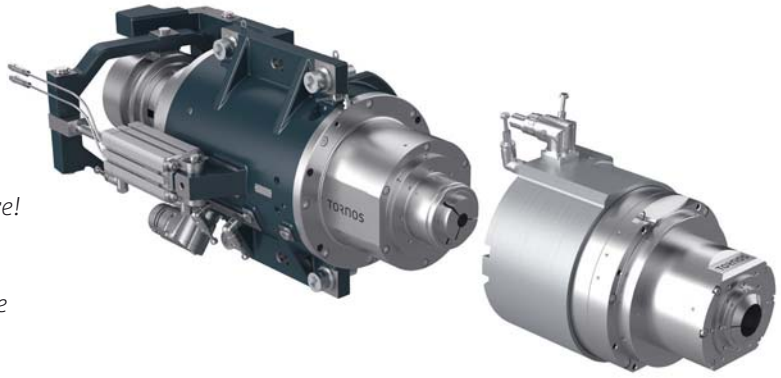
10-bar pump

 Option

era,” explains Philippe Charles. The first noteworthy difference probably is the machining diameter of 36 mm, besides the extremely rigid machine structure! If the user opts for the 36 mm spindle, the torque of 53 Nm is simply titanic; even the spindles with a diameter of 25.4 mm produce a torque of 27 Nm. “The machining capabilities of the machine are really impressive – to such an extent that we are able to turn parts based on the parameters of the machining with fixed-headstock even if the machine is operated close to its limits,” Philippe Charles adds. He continues: “Since we want our customers to be quite relaxed, we have provided our machine with long axis travels and the most powerful and rapid driven tools in the market. SwissDeco 36 TB is not only capable of manufacturing the workpieces on hand but also of ensuring perfect management. We offer various solutions for workpiece ejection no matter what dimensions they have.”

12-position turret with B axis

SwissDeco 36 TB is equipped with a 12-position turret (the same as on machine model T); it is mounted on a B axis and driven by a torque motor. It can be swiveled by $\pm 130^\circ$ and used both for main and back



machining operations. So the full diversity of turret tools can be utilized to perform machining tasks that comprise angular machining. Furthermore, the turret can be operated by means of the TISIS CAM software; this CAD/CAM solution enables workpieces to be programmed that require a multitude of points. TISIS CAM is used to program complex operations while the rest of the codes can be written with the TISIS programming module.

Ergonomic design, conceived with efficiency in mind

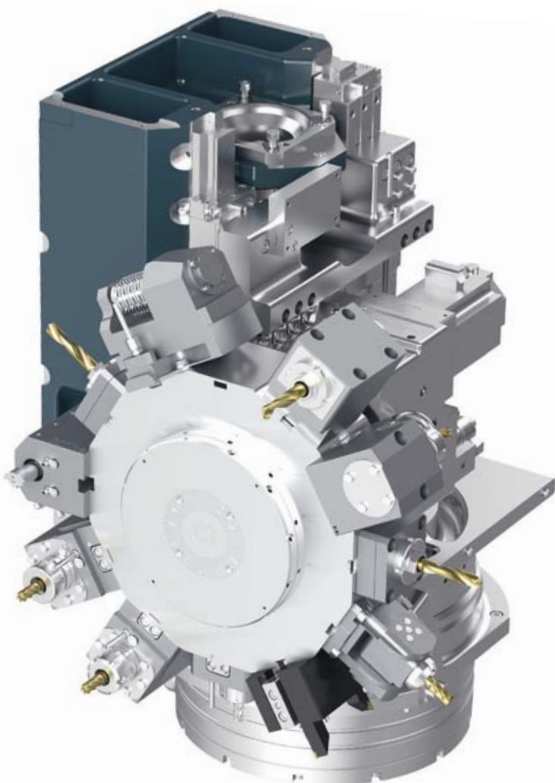
The Product Manager gets back to one of the key aspects of SwissDeco's development: “We wanted a machine easy to use and to set up even during the machining of complex workpieces.” Moreover, they wanted the machine to offer optimum ergonomic features – and that's what they got with this TB version. In fact, the turret can approach the machine door as close as possible to simplify tool change.

Efficiency: quick-change system

Optionally, the turret as well as other tooling systems can be complemented by a quick-change system. The tool head can be unlocked by turning a single screw. This system is compatible with the presetting devices to enable set-up to be performed outside the machine. Any changes will become effective within a few seconds while the design guarantees excellent concentricity and repeatability. The quick-change system can be used both for stationary and driven tools to ensure maximum flexibility. It permits ultra-fast set-up changes – despite SwissDeco's vast tooling options.

Efficiency: hydraulic brake

To guarantee high machining quality in all circumstances, SwissDeco is the first Swiss-type lathe that features a high-precision hydraulic brake. The latter is actuated by material deformation and enables the



bar to be precisely locked in the correct position and thus spindle bearings and spindle body to be relieved in case of 4 and 5 axis machining. Likewise, the surface finish is considerably improved; the bar is maintained in the correct position which enables machining tasks to be performed that were unachievable on conventional lathes or bar turning lathes so far.

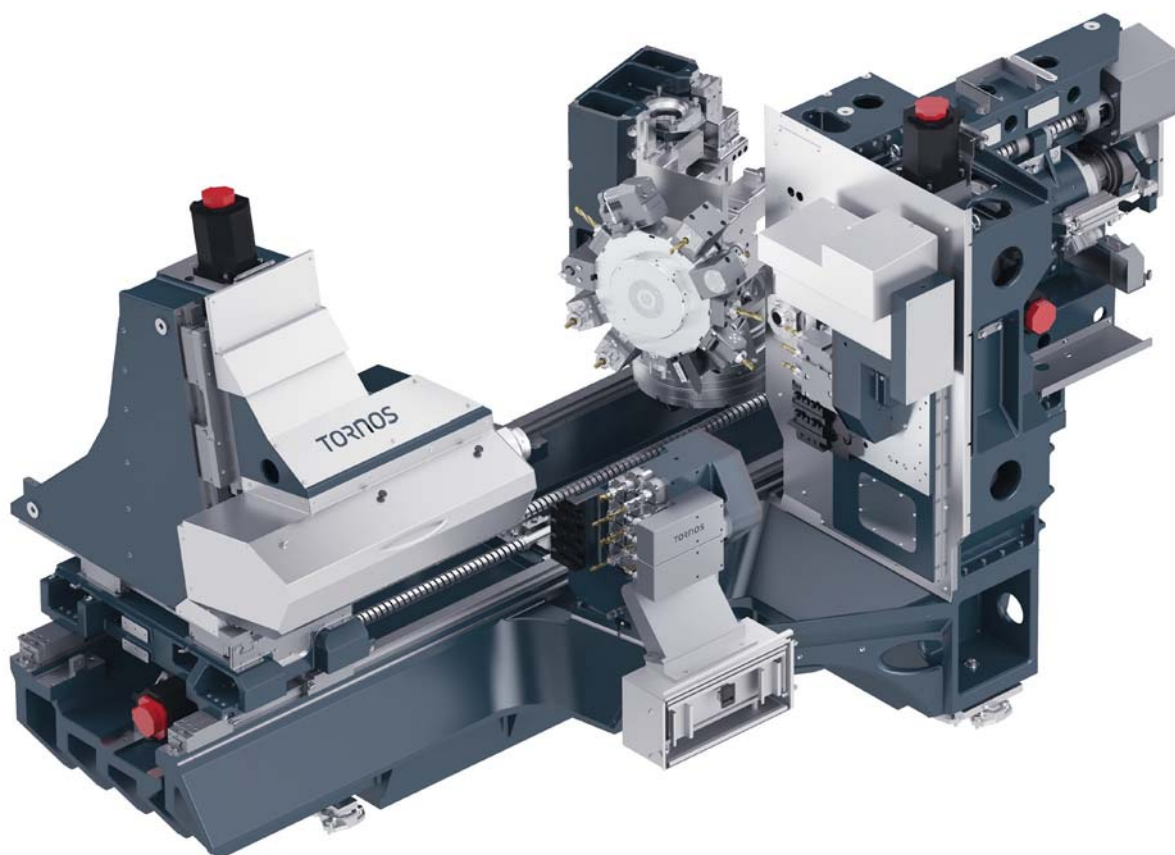
Efficiency: TISIS Optimove

TISIS was introduced together with SwissNano and has been enhanced over the years. With the launch of SwissDeco, the latest innovative TISIS version is now available: instead of being a mere programming means, TISIS has evolved to serve as a true means of control for SwissDeco machines. From now on, the machine can calculate the real machining time very precisely. "Our customers will now be able to realize machining jobs requiring extreme precision as well as production scheduling in a most meticulous manner," Philippe Charles declares. TISIS Optimove offers a multitude of additional advantages, the most

important one being the reduction of machining times. Just like TB-Deco, TISIS Optimove calculates the ideal tool path and the ideal feedrate for each tool. This may give the impression of a rather slow machine, however, the numbers speak for themselves: thanks to its 3 tool systems, the productivity of the machine is simply excellent. In certain cases, TISIS Optimove allows savings in time by almost 25%. In combination with the energy consumption reduced by 11%, this solution provides the user with a significant added value, without operator intervention. Another benefit is the reduced mechanical wear. Thanks to the optimized axis travels, unnecessary acceleration is eliminated which means the mechanical system is protected while vibrations and interferences are avoided during the machining process.

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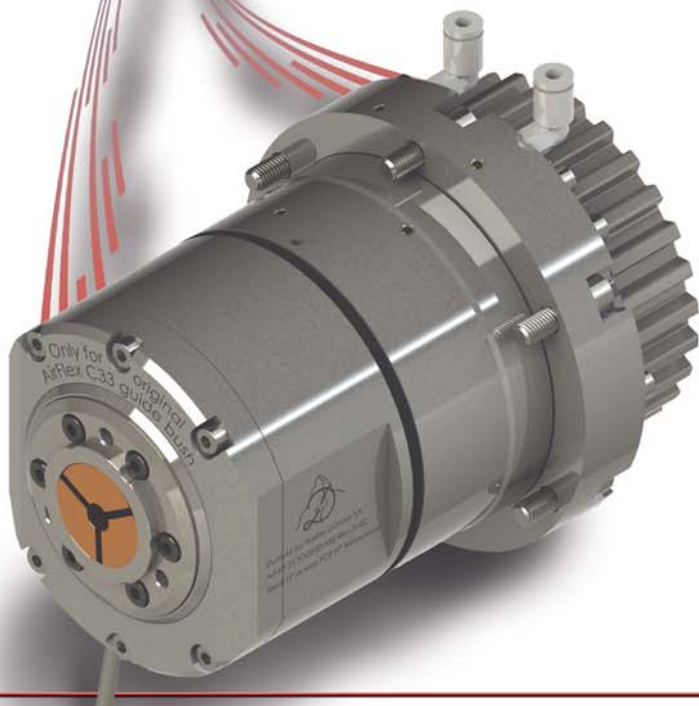
The fact that SwissNano caused quite a stir is also due to its advanced level of design integration; this applies both to its appealing appearance and ergonomic features as well as to its ease of use and the quality of the parts manufactured. "Never before have our design engineers gone so far as regards the integration of all these parameters," Marketing Manager Brice Renggli explains by way of introduction.

A clear market response

With more than 300 machines working in the markets all over the world, one can justifiably say that the machine is a success. The customers are unanimous: the machining area with 180° accessibility and the 'bubble' type enclosure that can be removed most easily, the control unit mounted on a movable arm and the wireless touch pad proved to be extremely popular. However, beyond these rather important aspects, the very high quality and the reliability of the machine as well as its machining capabilities are the features appreciated most by the customers.



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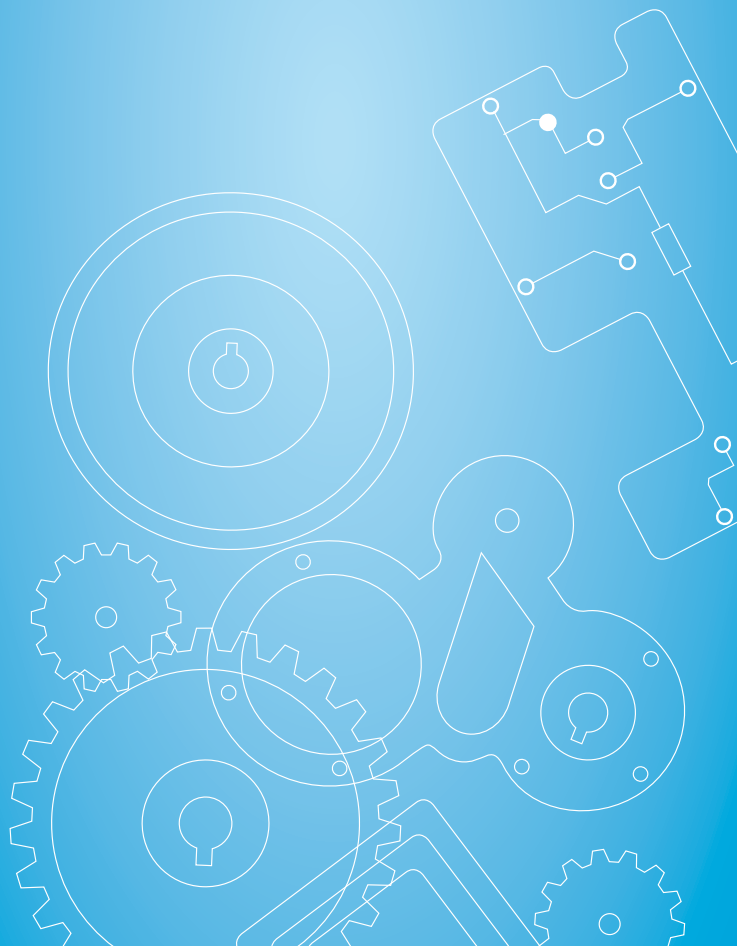
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2/3 used for movement components in watch-making... but the machine offers a lot more

The 6-axis kinematics of the machine enable numerical settings to be used in all dimensions. All users emphasize the ease of use provided by the counter-spindle in three linear axes. Apart from the counter-spindle, the second platen can accommodate tools underneath the counter-spindle and this increases the machining capabilities of the machine. Depending on the tool carrier, 2, 3 or 4 tools can be mounted underneath the counter-spindle, i.e. machining can be done simultaneously with both platens. Furthermore, the machine features an enormous flexibility thanks to a wide range of options that enables it to meet the market requirements. Two examples of

these options are the thread milling device and the gear hobbing unit. If required, the machine can also be equipped with high-frequency spindles. "Especially in watchmaking, but also in other industries, there is a vast range of parts that can be machined on a SwissNano machines," Brice Renggli makes clear.

It was high time to think bigger

With its bar capacity of $\varnothing 4$ mm, SwissNano may be a bit unsatisfactory for those specialists who want to machine parts of larger diameters. In fact, they would often prefer a machine equipped with the same features while offering a larger bar capacity. And their dreams will come true – with Tornos presenting its SwissNano 7. The responsible manager explains:





“The idea was to offer a machine with a very similar design that exhibits top-notch performance. Against this backdrop, our engineers have paid particular attention to the machine stability.” And the result is amazing. While being only slightly larger than the standard model, the machine is still small and highly ergonomic and boasts extreme stability and precision.

Considerable advantages

Based on more than five years of experience with SwissNano, the company can guarantee the smooth development and fast market launch of the new

machine. As regards the advantages, Tornos is not only able to make full use of the know-how of its employees but also to produce the machines on the existing assembly lines and to benefit from the experience with the large number of modules that have already proved their worth in the market. It can thus be guaranteed that the customers will get top quality. “With SwissNano XL, we will offer SwissNano quality at a larger size, especially for the electronics, medical and dental markets,” Brice Renggli points out. This new machine will be unveiled at the AMB in Stuttgart in autumn 2018. Its commercial launch is planned for the beginning of 2019.

Programming? TISIS and TISIS CAM

Just like the conventional SwissNano, SwissNano 7 can be programmed using the Tornos software applications TISIS and TISIS CAM. As a CAM solution, the TISIS CAM program has been designed specifically to help Tornos customers with complex operations. Moreover, it significantly reduces the set-up time and, in combination with TISIS, it is the perfect solution for efficient programming and workpiece optimization. TISIS CAM reveals its full usefulness when tapping SwissNano's full potential.

Specifications of the SwissNano machines	SwissNano 4	SwissNano 7
Diameter	4 mm	7 mm
Workpiece length	28 mm	50 mm
Spindle speed	16,000 rpm	16,000 rpm
Spindle output	1.2 kW	2.5 kW
Speed of counter-spindle	16,000 rpm	16,000 rpm
Output of counter-spindle	1.2 kW	1.2 kW
Tooling		
Turning tools for main machining	5 (8x8) +3	7 (8x8) +3
Front tools for main machining	3 (Ø 16)	4 (Ø 16)
Front tools for back machining	2 (Ø 16)	4 (Ø 16)
Driven tools for main machining (options)	2	3
Driven tools for back machining (options)	HF	3
Dimensions		
Dimensions (width, depth, height)	650, 1800, 1570 mm	750, 1850, 1655 mm
Oil tank	15 l	15 l
Chip bucket	45 l	45 l

Why choose a SwissNano 7?

The workpiece machining capacity is considerably increased from $\varnothing 4 \times 28$ mm to $\varnothing 7 \times 50$ mm, the spindle output from 1 kW to 2.5 kW and the number of standard tools from 13 to 18. Furthermore, numerous supplementary machining functions such as thread whirling for main machining operations as well as gear hobbing, polygon milling or cross drilling for back machining operations are added. To ensure maximum efficiency, the part collection system is offered in various versions and can be selected depending on the length of the parts produced; it can be swapped in just a few moments during set-up work. Last but not least, the machine features a perfect thermal stability.

Newcomer in the competitive landscape

Since it is offered at a highly competitive price, there is a good chance that SwissNano 7 will stir up the market of the machines designed to produce high-precision parts of diameters between 4 and 7 mm. Brice Renggli concludes: "Even if the machine remains small and therefore will easily fit in every workshop, we will now offer SwissNano in two sizes for our customers to get better options to be able to adapt their machines to the parts to be machined."

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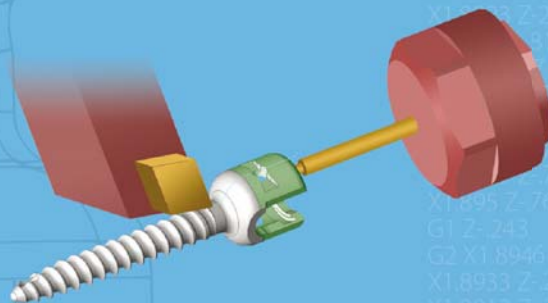
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10-15 September 2018: **IMTS**, Chicago (USA)

18-22 September 2018: **AMB**, Stuttgart (Germany)

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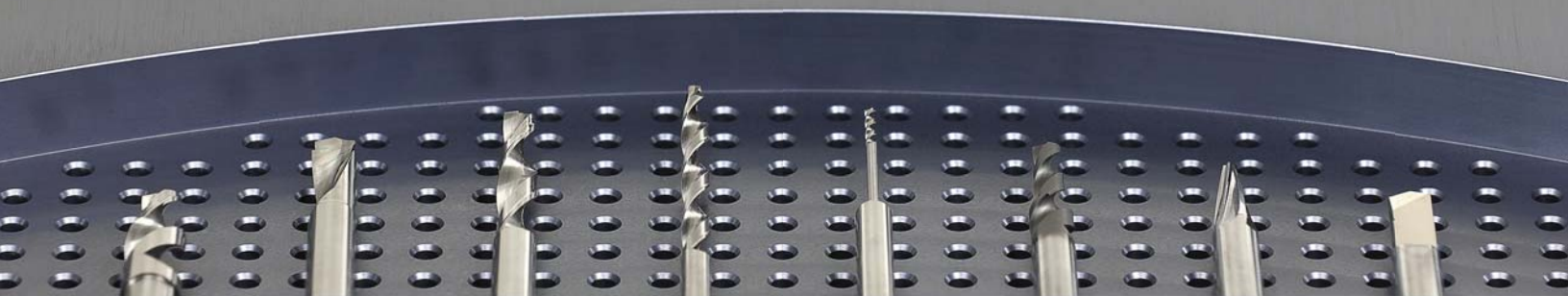
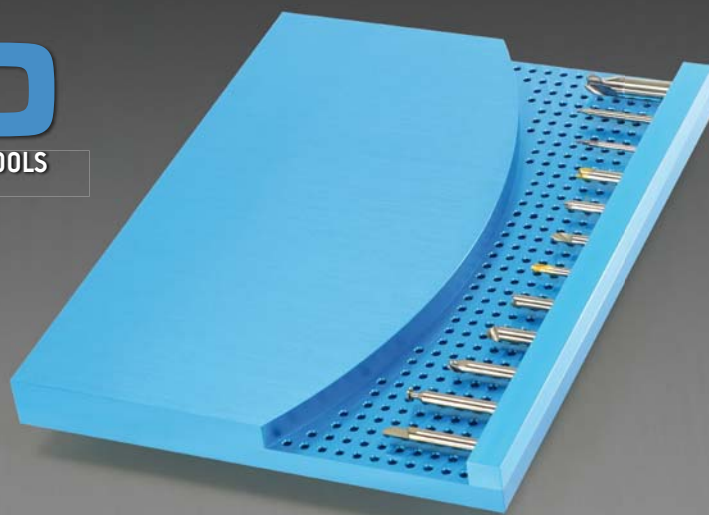
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"We would like to invite each visitor to take a souvenir by having his or her picture taken together with our SwissNano wrapped into the stars and stripes"

AMB AND IMTS: two major events

Tornos pursues a single objective – providing the customers with even more efficiency

In September, Tornos will attend two major exhibitions, IMTS in Chicago and AMB in Stuttgart, Germany. “We will unveil various solutions that shall meet the requirements of each user and keep our customers competitive,” Marketing Manager Brice Renggli explains by way of introduction.



IMTS – the most important American machine tool exhibition

IMTS in Chicago is the most important trade fair in the United States. At this technology fair, there is no lack of innovation; and Tornos is no exception to this. On the Tornos booth, the visitors are invited to make a discovery tour and get to know the individual machines. Each machine will be shown in live operation, machining a certain part of a pen the visitors can assemble at the end of their visit of booth 339053.



INTERNATIONAL EXHIBITION
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September 18 - 22, 2018
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messe-stuttgart.de

Due to its specific qualities, the most Swiss of all Tornos machines that had been initially designed for watch components has found its way into some applications that are going beyond the boundaries of this field. It will be exhibited with a special US wrapping. “We would like to invite each visitor to take a souvenir by having his or her picture taken together with our SwissNano wrapped into the stars and stripes,” says Brice Renggli.

IMTS will also unveil the SwissDeco; in fact, this top-of-the-range machine will be presented for the first time in the US. This model with dual platen has been chosen for market launch on this occasion. The machine version shown has fewer tool positions



A pen will be machined at the IMTS booth.

New partnership with Methods Machine Tools

Desiring to get closer to its customers, Tornos has initiated a partnership with Methods Machine Tools. From now on, this company will represent Tornos in various states in the United States. At the Methods booth, the trade fair visitors will be able to admire a MultiSwiss 8x26, the big sister of MultiSwiss 6x16. Thanks to its extraordinary performance and its state-of-the-art technology, this machine quickly found its way into the automotive market.

On the booth of Methods Machine Tools (booth 339119), visitors will also be able to discover the Swiss DT 26, an ultra-rigid and ultra-powerful entry-level machine that offers a high level of performance at a highly competitive price: Last but not least, a SwissNano machine will be presented.

than the turret version but features even shorter chip-to-chip times. Just like the turret, the platen is mounted on a Z-axis that enables deep-hole drilling operations to be performed and the contours to be tracked.

Tornos will also present its successful MultiSwiss 6x16 model. This extremely compact machine can replace a Swiss-type lathe while at the same time, multiplying the productivity of such a machine by five or six times, depending on the workpieces. Any visitor looking for a machine that is able to meet the most advanced requirements will discover the Swiss GT 26 with B-axis. This machine can machine the most complex workpieces and boasts a highly competitive cost/performance ratio.

AMB – this year's most important European machine tool exhibition

AMB in Stuttgart, Germany, is one of the rare shows that managed to evolve over time. Based on an outstanding infrastructure, it is possible to concentrate high-quality equipment on a comparatively small surface area here. Tornos will attend AMB under the slogan "Turn to Tornos" and will exhibit several machines, among them a SwissDeco 36.

This will be the first SwissDeco 36 TB machine to leave the factory gates in Moutier. This exceptional



machine is equipped with a turret that is mounted on a B-axis and thus enables even extremely complex parts to be machined. It has large axis travels, the zero-maintenance approach and the automation options make the SwissDeco the most advanced machine in today's market. In addition, Tornos will demonstrate its expertise in the fields of automation and Industry 4.0. "We believe that with our highly competitive solutions, we are able to provide you with sufficient arguments for you to turn to Tornos the next time you plan an investment," Heiko Benz, Managing Director of Tornos Germany, points out.

Automation of the Swiss GT 32

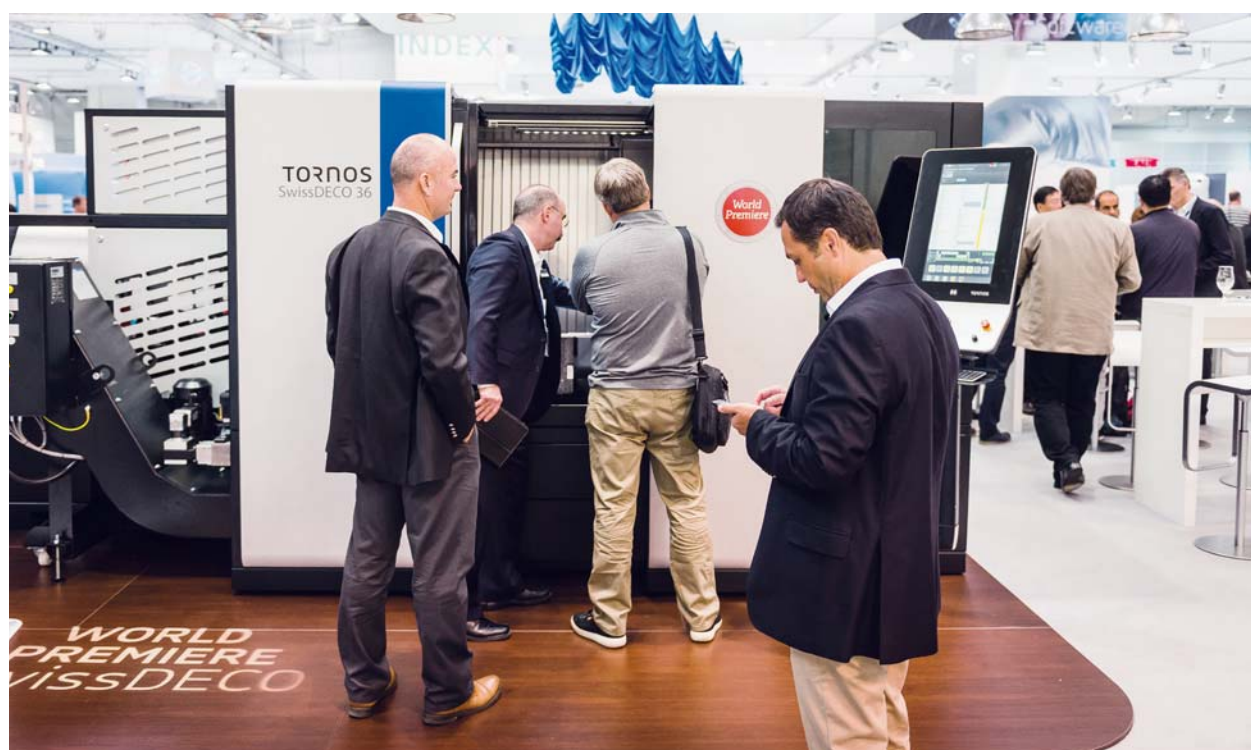
The need of process automation is becoming increasingly important, and this is not restricted to multi-spindle lathes or high-end machines such as the SwissDeco. To meet this need, Tornos joined forces with a partner and can thus offer automation solutions at an affordable price. So, at AMB, a Swiss GT 32 equipped with a robot for direct workpiece loading and unloading as well as workpiece palletising will be presented. This cell can be complemented by other stations and devices such as a workpiece cleaning station or a measuring system. Today, Tornos is able to offer fully customised automation solutions.

MultiSwiss 6x16: a new design for even better ergonomics

To date, MultiSwiss 6x16 has still been branded with the old Tornos logo. From now on, the new MultiSwiss family will finally be merged with a uniform design and will be equipped with the new Tornos Control Panel that made its debut on the SwissDeco and shall further facilitate machine operation.

MultiSwiss 8x26: the partner of choice

The MultiSwiss 8x26 machine has experienced a global success in all market types. This powerful and highly productive high-precision machine is the real partner of choice for any kind of production. With its eight spindles and eight slides for front machining, where each slide can hold up to three tools, MultiSwiss 8x28 will bring the MultiSwiss range to a new performance level, both in terms of complexity and productivity. Thanks to its highly dynamic eight synchronous-drive spindles and ultra-fast barrel indexing, the MultiSwiss 8x26 enables the production of elaborate workpieces with extraordinary productivity. Its high-power spindle drives with 11 kW boast a high torque of 16.1Nm. All spindles, including the counter-spindle, have their own C-axis. In being able to reach 8,000rpm in just tenths of a second, the



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spindles make a major contribution to machine performance. The maximum standard workpiece length is 65 mm. Optionally, the machine can be equipped with Y-axes that will further increase its potential. The machine is available in 3 configurations: a 'simple' set-up without Y axis, the 'intermediate' version with 3 Y-axes, and the 'full' system with 6 Y-axes for the most complex parts.

TISIS at the forefront of Industry 4.0

TISIS and Industry 4.0 will be presented in a prominent place at the Tornos booths in Stuttgart and Chicago. With TISIS, Tornos is at the forefront of Industry 4.0, and the software is provided with more and more functions based on customer feedback. TISIS Optimove will be the great innovation. This new function, that made its debut with SwissDeco, enables the computer to be accessed directly in real time during the machining process without having to involve the machine. What's more, TISIS Optimove autonomously optimises the tool travels, which means that the cycle time and the acceleration rates are optimised as well. The result is an increase in productivity and a decrease of energy consumption and machine wear. In this way, TISIS allows substantial savings e.g. by tapping the full potential of the SwissDeco machine.

SwissNano 7: a machine boasting a new level of power

Thanks to its outstanding machining stability, the SwissNano 4 has already found its way outside the watchmaking sector. Today, SwissNano machines can be found in fields such as the connector industry, the dental industry or even the automobile sector, which is not a market that is normally associated with the original specifications of the machine. Despite this, the machine proves to be the partner of choice for anyone who needs high-precision parts. "The experience has shown that the market was lacking a machine that, on the one hand, features the same characteristics in terms of precision and machining quality and, on the other hand, has a higher capacity," declares Philippe Charles, Product Manager Single Spindle. This feat has now been accomplished – with SwissNano 7!

Milling: a turnkey solution

As Almac machines have been fully integrated under the Tornos label since the beginning of this year, they will also have an important role to play at the AMB trade fair. The Tornos milling solutions are fully customizable and can be adapted to any needs. With their high productivity and reliability, these machines are unique in the market. Furthermore, they are offered at an extremely competitive price. For instance, the 7-axis version of the CU 2007 machine is an excellent alternative to an expensive turning/milling center. As for the BA 1008, it finds the approval of the most demanding customers in the watchmaking and medical sectors. This is the best proof, if any such proof were needed, of the capabilities of this machine.

Tornos is at your service

The new Tornos services cover a vast range from field service to upgrading existing products and used machinery. "This new range of services is quite impressive and enables both your Tornos machines and your company to remain competitive year in and year out. In case you want to part with one of your Tornos machines, we would be delighted to make you a take-back offer even if you do not buy a new machine from us. If you are thinking about purchasing a used Tornos machine, do not hesitate to visit our booths or your nearest Tornos representation to discover the services offered as well as our machine stock," Matthias Damman, Head of Tornos Service concludes.

Make sure you don't miss the Tornos booths at the AMB in Hall 4, stand 4A11 and at the IMTS stands 339053 (Tornos) and 339119 (Method); our experts will be pleased to welcome you there.

imts.com
messe-stuttgart.de



Mideos can count on a dynamic and young staff for reaching its ambitious goals.



Based on state-of-the-art means of production and highest-level skills, Mideos transfers the expertise from the automotive industry to the medical field.

MIDEOS:

the success

of a dedicated team!

The company Microdeco, based in the Spanish Basque Country, is renowned in the automotive industry and successfully supplies numerous OEMs in this field. Furthermore, Microdeco directly delivers its parts to the production lines of major car brands.



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The success of a dedicated team

This success is the result of hard and rigorous work, of particular and consistent attention to quality and to the tiniest detail and, above all, of an ultra-performing team. After the financial crisis of 2009, José Iraolagoitia, CEO of Microdeco, was aware of the risk of focusing on one market only and decided to envisage a diversification of the company's activities. Mr. Iraolagoitia is fully aware of the skills of his team and of the expertise the team has developed for the customers from the automotive industry. Microdeco excels in the rigorous control of costs and quality.

Thorough reflections and evaluations brought Microdeco to opt for the medical market for its diversification. For Spain, this is an important market that is only weakly linked to the automotive market. The CEO explains: "This diversification was intended to enable us to benefit from a better stability while making our know-how available to the medical market. However, the requirements of these markets are different, just as the required certifications are. We soon recognized that this activity had to be an activity of its own for us to be competitive. Once this

2½ years of Mideos:
more than 500 different set-ups

The history of the Mideo company at a glance.



stainless steels, cobalt-chrome or even PEEK. In a little more than two years, more than 500 different set-ups have already been realized. "This impressive number e.g. does not include the workpieces of the same type but of different lengths," the CEO emphasizes. The parts included in this number are really different parts which is the best proof – if any such proof were needed – of the company's flexibility. Mideos does not only stand out for this extraordinary flexibility but also for the ultra-efficient control of quality and costs. A broad range of technologies – operations such as heat treatment, grinding, surface treatment, cleaning and a large number of so-called secondary operations – is made available to the customers of Mideos.

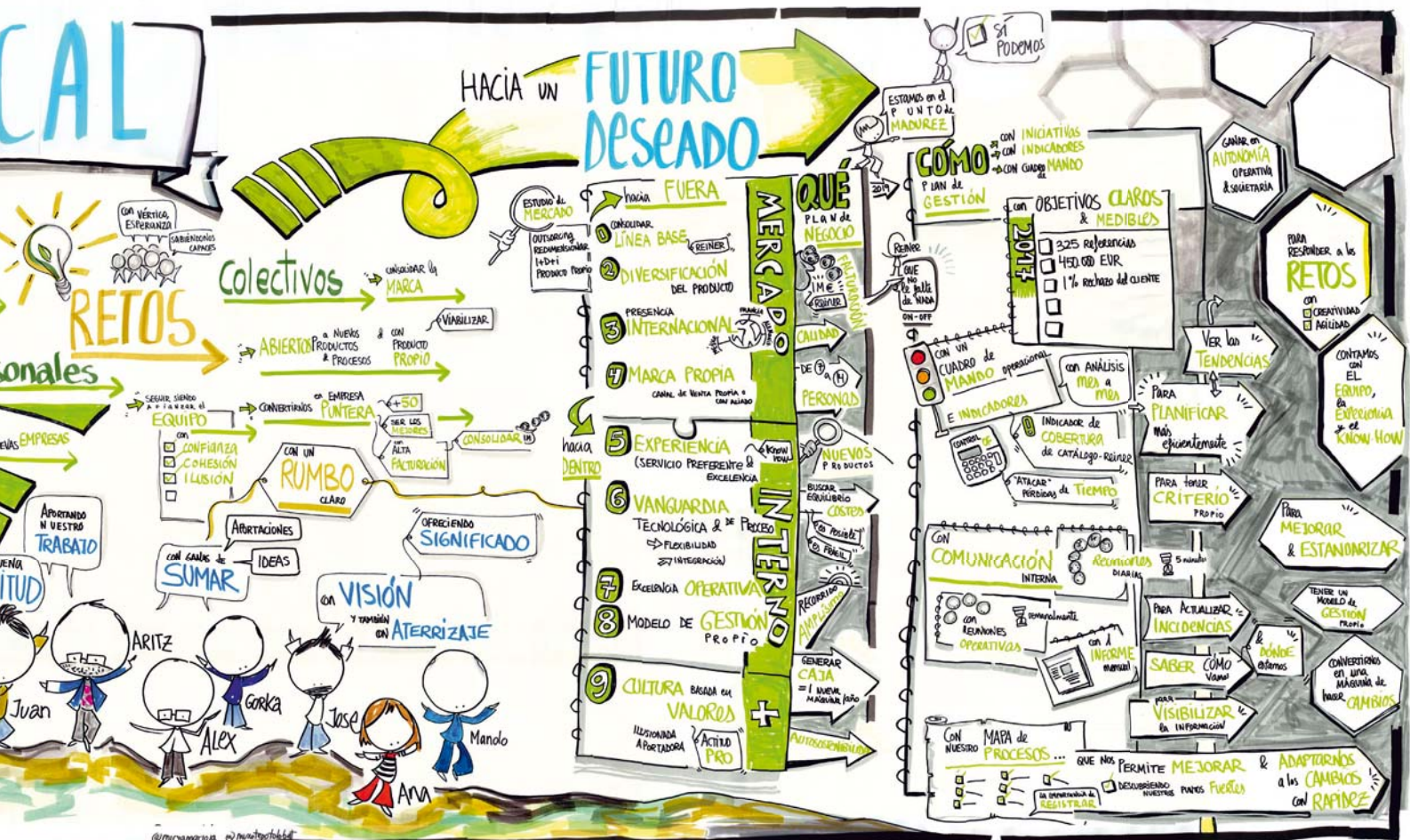
A win-win partnership

Mideos has acquired significant expertise in different types of workpieces, and dental implants are only one facet of the product range offered by Mideos. The company also manufactures maxillofacial implants,

bone screws for the spine, or polyaxial locking heads made of various types of materials.

Mideos' customers are major OEMs active in the medical field; the company has no own brand.

Nevertheless, they didn't want to confine themselves to mere machining and, from the very beginning, they wanted to have their own research and development division. To create a win-win situation, this think tank is able to interact with the final customer. In this way, the company makes its machining expertise available to the customers to jointly find the best compromise between functionality and costs. This kind of collaboration is often intense and both parties benefit from it. It is a real partnership which enables an exchange of views which is constructive both for the customers and for Mideos. "We are working hand in hand to jointly achieve success; for us, this is a key aspect," José Iraola goitia emphasizes. "Once we have received the design drawing from our customer, we start by preparing the production



plan, create the part program and define the control model. We then set-up the machine accordingly and start series production. The parts undergo the subsequent final inspection before they are shipped. One of Mideos' strengths is quality control."

Why was Tornos chosen? That's obvious!

Why did they choose Tornos? "This is a brand we know well and which has an excellent reputation in the medical industry. Right from the start of the

project, we have been able to count on the professionalism of Tornos Spain. We rather quickly opted for the EvoDeco machines or, to be more specific, for the EvoDeco 16 which, today, constitutes the majority of our machine inventory. From the very beginning, we wanted to get a machine that was able to realize the most complex components. We simply did not want to be limited by our means of production. Some of our machines are even equipped with B axis that enable us to go even further. With its four independent tool systems, its four motor drives for driven tools and the

The Tornos EvoDeco machines play an important role in the development of Mideos. Power, kinematic features, cycle time, reliability... anything united to guarantee success.



Machining expertise is essential, but quality surveillance skills are equally important.



Strategy meeting on the Mideos premises; from left to right: José Iraolagoitia, CEO; Aritz Serrano, Production & Quality Responsible; Ivan Abril, CNC Programation and Setting-up Responsible; Alex Boullosa, Process Engineering and Planning&Scheduling Responsible.

large number of tool holders available, the EvoDeco is simply the ideal machine for the workpieces we have to machine. In case a workpiece with a max. diameter of 16 mm has to be processed, the machine is able to do so, no matter how complex the part is," the CEO explains. Thanks to the high flexibility of the machines, the Mideos team can finish the workpieces with short lead times and at an extremely competitive price. He continues: "Setting the machine is done in no time, so, we can realize several set-up changes per day. The machine is just like Mideos: ultra-flexible. It can be adapted to the requirements of each individual workpiece and efficiently produce single items."

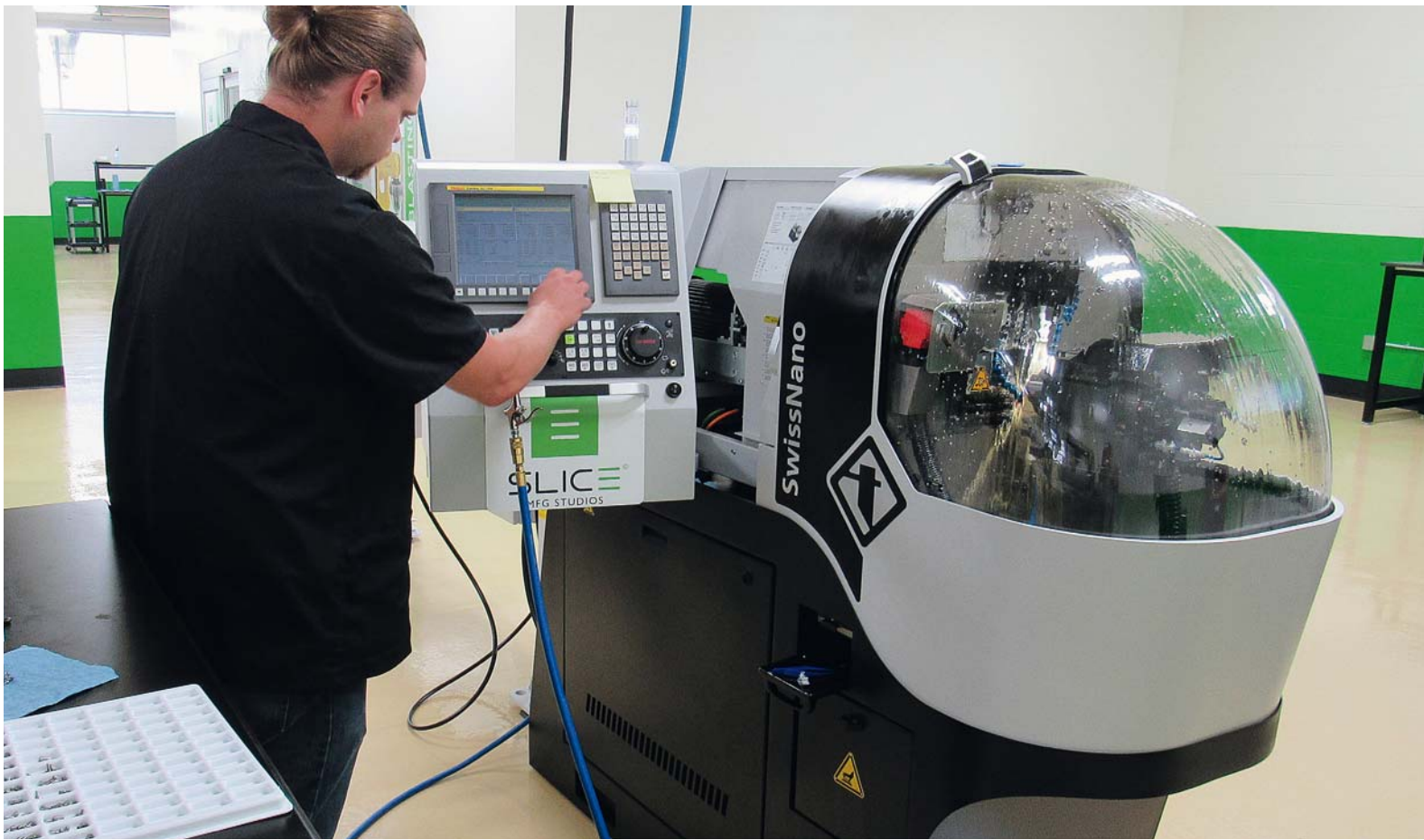
José Iraolagoitia summarizes: "EvoDeco is a real production-oriented machine. Once set up, its power and its kinematic features are making the difference in a most compelling manner. As for me, I think there's no other machine in the market that is able to compete with EvoDeco's cycle times. The machining process is stable and the machines have given proof

of their exemplary reliability so far. Our EvoDeco machines have become true and essential partners of our production team. To support them, we solely use tried and tested high-quality equipment for our production processes. But not only for our equipment but also for our oils and tools, we have selected top suppliers – we purchase our oil from Motorex and our tools e.g. from Applitec, Bimu, Iscar, or Micron. Their pronounced goal is to guarantee quality and traceability at all times, whether for large-batch production or for prototyping."

Today, Mideos pursues its growth step by step in a most serene manner. The young and dynamic staff is ready to tackle the new challenges of the medical industry. Now it's up to you to test the responsiveness of the company.

mideosmedical.com





Lyal Witchey, Manufacturing Technologist at Slice Mfg. Studios - overseeing SwissNano production and holding tray of parts.

SLICE MFG. STUDIOS:

Build it and they will come

When American engineer and entrepreneur Randy Theken couldn't find contract manufacturers to meet his needs, he thought outside of the box: Why not provide on-time delivery and all required services under one roof? He solved the problem himself in 2015 by starting his own full-spectrum manufacturing studio. A fleet of five Tornos Swiss-type lathes helps Slice Mfg. Studios, LLC meet those very needs.



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slicemfg.com

Located in Akron, Ohio, Slice Mfg. Studios' 40,000-square-foot laboratory and manufacturing facility is a sight to behold. Theken positioned Slice Mfg. Studios adjacent to a historic 1929 Akron airport terminal, bringing together liberal arts and high-tech engineering — along with history and a vision for the future — into a single domain. From this site, the business carries out design, development, prototyping, mechanical testing, parts manufacturing, final production and even sterile packaging for clients ranging from medical device manufacturers to defense contractors.

A vision comes to life

As Theken began breathing life into his vision of a state-of-the-art contract manufacturing service, he naturally looked for state-of-the-art machine tools. At the International Manufacturing Technology Show (IMTS) in 2016, Slice bought — in one fell swoop — three Tornos GT 26 Swiss-type lathes with B axes, a Tornos EvoDeco 32, and a Tornos SwissNano. It was at the same trade show that Theken met

“What we have here is unique: In a single location, we can serve all of these different needs, end to end”

former Tornos US President Philip C. Miller, who joined Slice in 2017 as vice president of sales and business development, underscoring Theken's determination to equip his company with top-tier leadership to match its world-class ambitions and facility.

Miller, a second-generation “machine tool man,” says Slice is unique among its competitors.

“What we have here is unique: In a single location, we can serve all of these different needs, end to end,” he explains. “Whether you’re a medical company trying to get US Food and Drug Administration approval or in need of prototyping, mechanical testing or automated sterile packaging, Slice can support you.”

Employing 20 people today and looking to expand as the company grows, Slice is well situated to serve not only medical device manufacturers, but a wide range of industries, Miller says.

“We are still hiring people. It’s a booming market right now. I read in the newspaper today that there are more job opportunities than there are people looking for jobs,” he says. On the other hand, that creates a dilemma for manufacturers: “The whole industry is having trouble finding people. Most of our machine operators are journeyman machinists. Today, everything is designed on computer-aided design (CAD) and computer-aided manufacturing (CAM) software.”

Brad Fowler, Manufacturing Technologist at Slice Mfg. Studios - wide view of 3 Swiss GT 26 machines.



Positioned for success

Slice's Tornos machines position the business to keep pace as technology unfolds and customers' demands accelerate.

"We run about 75 percent titanium on our machines and 25 percent stainless steel," Miller says. "All five of our Tornos machines have LNS bar feeders."

Swiss GT 26: premium performance

The company's three Swiss GT 26 machines with B axes today are machining bone screws for medtech and small electronic components for the defense industry. A competitively priced workhorse, the Swiss GT 26 delivers premium performance with its latest-generation spindles, guide bush and control. Simple and ergonomic, it offers easy access to all tool positions. The Swiss GT 26 can be fitted with up to 40 tools, including 14 rotating tools. The machine is specifically designed to drive successful production of long and short turned parts.

The optional B axis on each of Slice's Tornos Swiss GT 26 machines allows for angular, axial, and radial drilling, tapping and milling — potential that ramps up the company's "all under one roof" advantage.

At the same time, the modularity of the Swiss GT 26 allows use of tool holders enabling thread whirling, a useful technology for producing bone screws and one that Tornos pioneered.

"We will be using thread whirling for bone screws. To date, we've been doing low-volume, single-point threading," Miller says.

EvoDeco 32

The Tornos EvoDeco 32 is efficient and well integrated, too, Miller says. Slice's EvoDeco 32, able to take on larger diameter work, is useful because it accommodates a greater number of tools in the cut at one time.

"One of the main things I like about the EvoDeco is the ability to have four tools in the cut simultaneously. That means you can be twice as fast on certain parts and if you have volume, you need fewer machines — and that costs less in the end," he explains.

The EvoDeco represents the pinnacle of the Tornos range. Designed for the most demanding operations and users, the EvoDeco machines are the most

Brandon Bohm, Machine Operator at Slice Mfg. Studios - overseeing Swiss GT 26 production.



Magnesium and Titanium bones screws, and PEEK implant prototype.





Theken Companies, LLC, the home of Slice Mfg. Studios, LLC.

powerful and productive on the market, affording blazing fast setup changes and unparalleled flexibility for efficiently producing the most complex workpieces. The EvoDeco 32 enables advanced machining processes like roughing and finishing on the guide bush and operation in differential mode (contour tracking) for simultaneous turning and drilling on the guide bush as well as counter machining operations. All of these can be carried out in hidden time with the EvoDeco 32's 10 linear axes and two simultaneous C axes.

SwissNano

The company's SwissNano — the micro and nano specialist — is used primarily for highly precise work — like a .129-inch micro defense connector. Its kinematics enable the machine to produce a wide range of tiny components, from the simple to the most complex, including cutting, with excellent finishes.

Backed by a keen vision and an infrastructure that most new businesses would envy, Slice looks toward the future with boundless enthusiasm.

"We are building our team to have a common cause and goal," Miller says. "We're hiring and training people and filling up all of these machines. Slice Mfg. Studios really started with a bold idea and a huge investment. Our founder believed, 'If we build it, they [customers] will come', and that has proven right. So far, this facility is our main sales tool."

And, as Slice continues to grow, Miller already has a wish list:

"As we grow, we probably will consider purchasing another Tornos Swiss GT series machine," he says.

slicemfg.com

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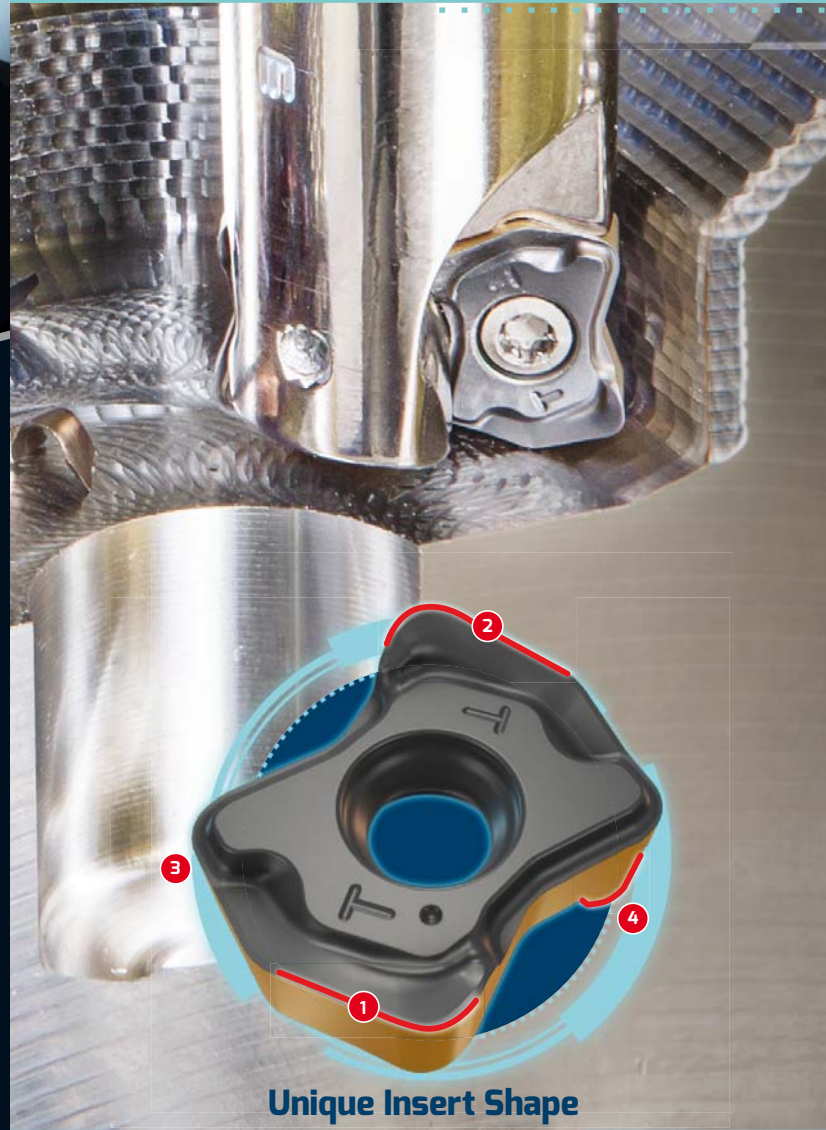
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INGUN RELIES ON THE SWISSNANO

Successful

throughout the world thanks to high precision

Any company claiming to be the 'market leader in test equipment manufacturing' really has to perform excellently. Ingun Prüfmittelbau GmbH from Konstanz, Germany, has become a synonym for permanent innovation and top-quality products boasting absolute precision. Among others, the company owes this prominent position to an intelligent manufacturing strategy and to machinery that has been selected with due care. And here, Tornos' SwissNano machines play a key role.



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In 1971, the company Ingun Prüfmittelbau GmbH opened its doors for business with the production of test probes and test fixtures. At that time, seven employees were involved with the production. Now, the staff has grown to more than 300 employees world-wide and Ingun Prüfmittelbau GmbH describes itself as the market leader in test equipment manufacturing. The company offers an unrivalled range of test probes and test fixtures used to test the electrical function of components (e.g. PCBs). Generally, products such as harnesses used in cars, battery packs for bicycles or state-of-the-art smartphones, laptops and PCs are tested for correct operation with an Ingun product. As devices are getting smaller and smarter, it is inevitable that their PCBs are getting smaller whilst featuring more functions and closed-loop control circuits. Examining and testing PCBs is becoming more and more complex and Ingun is making every effort to continue coping with these technical challenges as they evolve. The spring-loaded test probes ensure reliable and consistent contact security for more than 25,000 different types. Both standardised and customised test fixtures as well as an extensive range of fixture accessories

for individual upgrading are the company's second mainstay. The research and development department is working closely with the production and assembly departments to provide the customers with tailor-made solutions.

Infinite diversity

The diversity of the components to be tested requires an appropriate range of products and Ingun is taking pride in finding the adequate solution for each task. In addition to standard probes, the customer will find special high-frequency and high-current test probes. The latter ensures the safe transmission of high currents with little heating as well as precise measurement thanks to minimum internal resistances. The complexity of the test probes is not evident at first sight. They generally consist of a barrel, a spring, a plunger and a probe with gold-plated tip. It's getting really interesting, though, when it comes to the sizes and the material to be machined. For Ingun, outer diameters smaller than 0.8 mm are already large and the turning of 0.12 mm cross holes and of 0.19 mm studs are usual tasks. For the most part, brass as well as copper-beryllium alloys are machined. Most recently, the share of Teflon and other plastics has also been increasing as these materials have inherent insulation. The research and development department is working closely with the production and assembly departments to find tailor-made solutions. Since the time slots between engineering, prototype construction and test phase were becoming smaller and smaller and external suppliers weren't able to supply in short term, Ingun established their own turning shop in 2012. Even if Ingun is operating on a global scale today, the company is acting on the maxim to exclusively produce in Germany to ensure its high quality standards.

At the forefront of technological development

From the very beginning, Ingun's turning shop has been planned as a high-end solution for the development of new technologies. In close collaboration with design engineers, innovative solutions are sought and exceptional technologies are experimented with. The standard just isn't good enough for Ingun's turning shop. Here, the benchmark is set. Not until a process is running steadily, is it outsourced to external local suppliers who then will produce about 80 million turned parts per year. The fact that the turning shop is now equipped with 15 machines proves that this concept worked out. These machines already include



Millions of complex high-precision test probes are the signature feature of Ingun Prüfmittelbau GmbH.



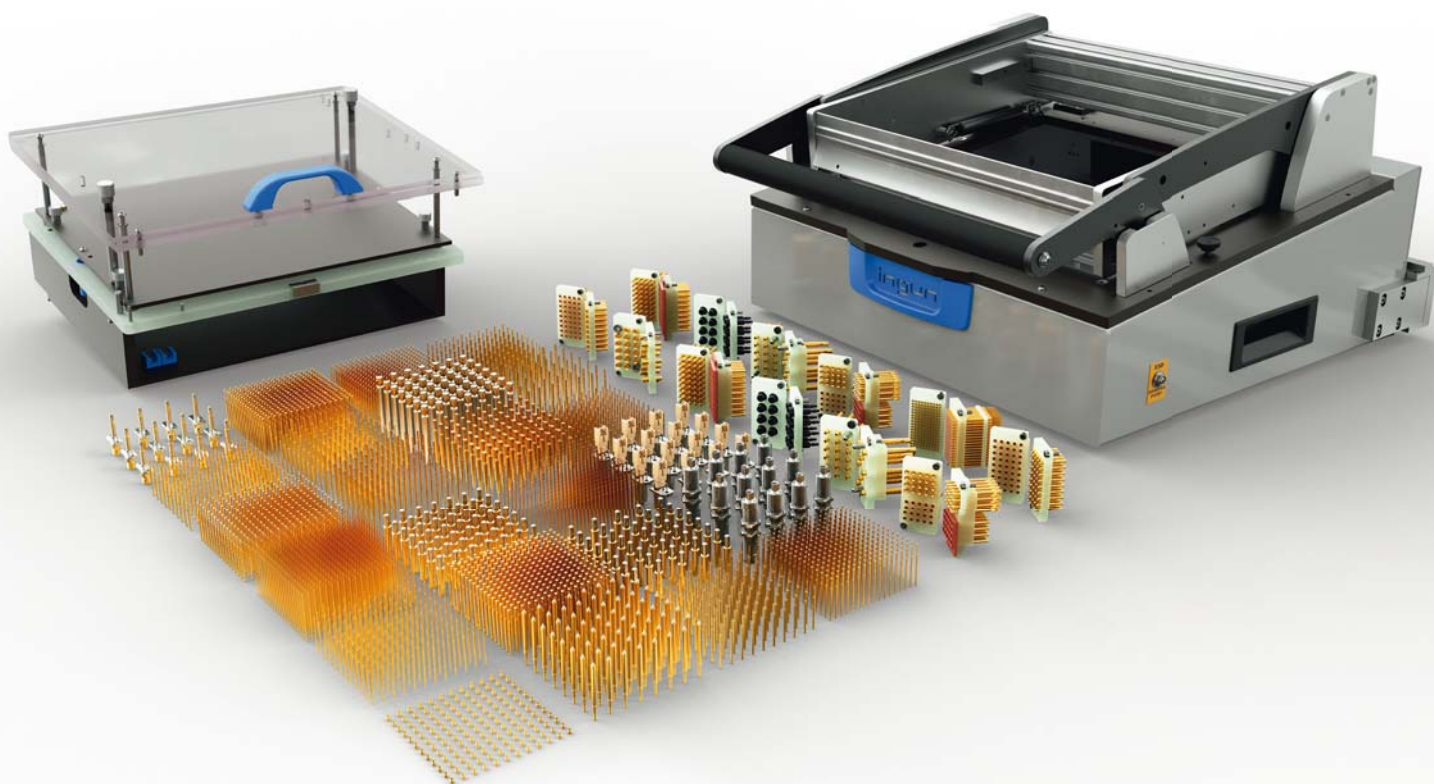
Ernst Dietrich, turning shop manager at Ingun, highly appreciates the SwissNano.

6 SwissNano machines from Tornos and two machines of this type will follow by the end of this year. The first SwissNano was purchased in 2014, when the turning shop had to manufacture a most challenging, highly complex test probe with a crown on its face. The technical parameters perfectly matched. The machine is small, compact, easily accessible, stable and precise. But was it able to prove this in practice? It was: In the course of elaborate turning trials in Pforzheim, Germany, the machine showed what it had to offer. In this context, Ernst Dietrich's team unanimously praise the support offered by Tornos. Together, they developed solutions for process optimisation. With a shortened bar loader, the vibration could be further reduced. In this regard, the specific oil extraction system and the pick-off device directly mounted on the spindle are some very interesting

features. Such details emphasise the high demands Ingun makes on its machines. Ingun does not content itself with the standards and is always looking for improvement. Meanwhile, Ingun has shifted to the in-house production of entire parts series thanks to the use of the SwissNano machines. This provides the company with additional flexibility that Ingun is justifiably proud of.

The beginning of a close partnership

The SwissNano convinced the responsible Ingun managers from the very beginning – and they have not been disappointed to date. The machine is amazingly fast, highly precise and it is easily accessible and easy to convert. With an annual ratio of two thirds set-up work and one third turning work,



Fully customized test fixtures are another mainstay of Ingun Prüfmittelbau GmbH.



Maximum productivity on an efficiently utilized surface area.



Likes working with SwissNano – the young team of Ingün Prüfmittelbau GmbH, together with turning shop manager Ernst Dietrich.

the latter is a decisive aspect. For Ernst Dietrich, the turning shop manager, the optimisation of the set-up times is essential. That's why the workplaces and processes are optimised accordingly in special workshops. The possibility to change over in 'next to no time' between turning with or without guide bush and the resulting flexibility of the SwissNano are features that are appreciated as well in this context. This is extremely important for a company that rarely has to machine the same part again. Another aspect applauded by Ernst Dietrich is the TISIS software. „My colleagues have felt at ease with it from the very beginning. The machine is easy to program; important features are already registered and the simulation function provides reliable protection against interference and opens up possibilities to further optimize the program.“ This passion to permanently push the envelope is typical for Ingün. The company promotes junior staff members and gives them the opportunity to prove themselves. So the team being responsible for the Tornos machines is still very

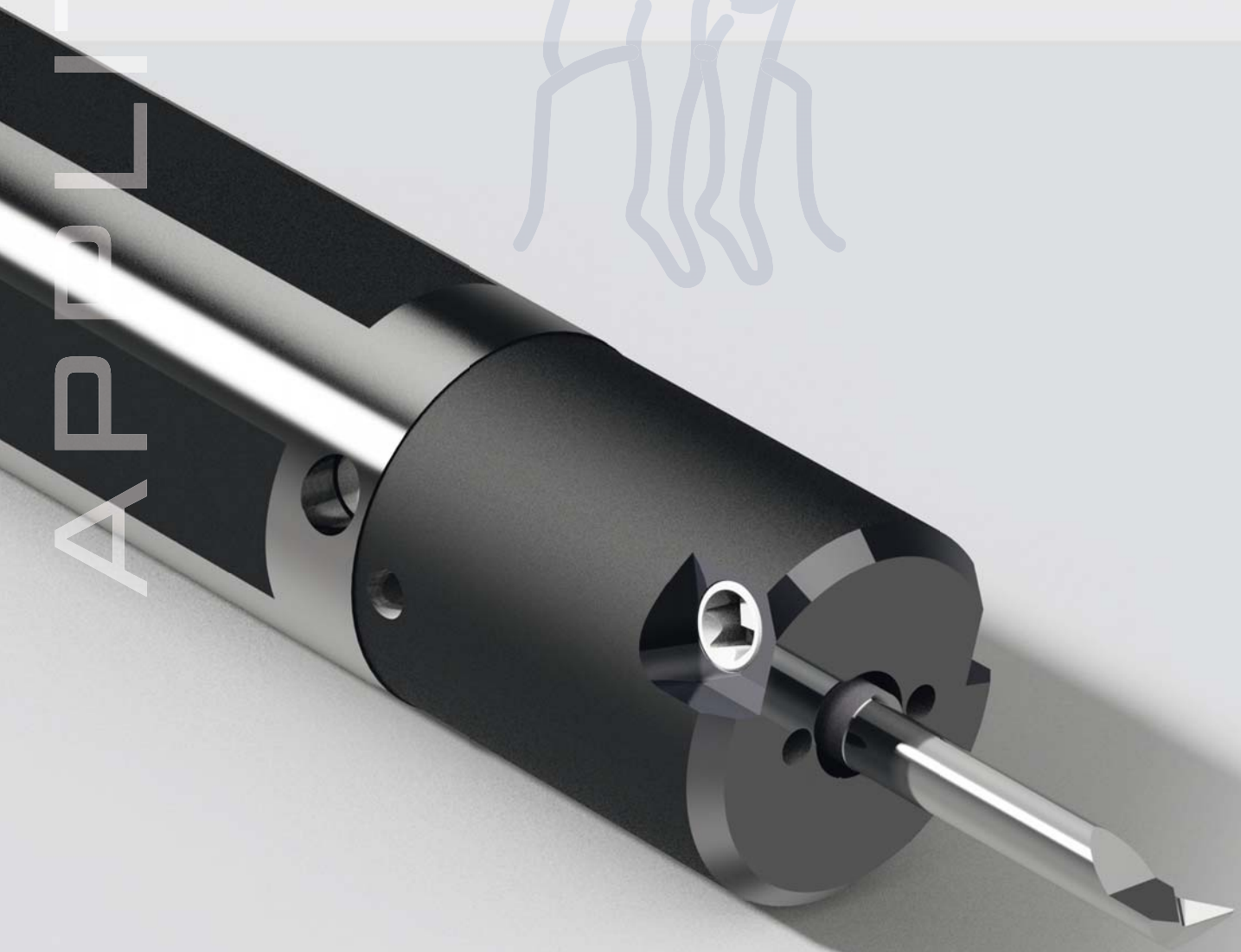
young, yet very competent and is fully committed to the tasks on hand. In addition, these young employees can benefit from the wealth of experience of their older colleagues. In this department, cycle times of just 15 seconds for extremely complex test probes are the rule rather than the exception.

Based on these positive experiences, the SwissNano machine will remain the machine of choice for Ingün Prüfmittelbau GmbH. This, however, does not mean that they will rest on their laurels. The company is even thinking about a strategic partnership with the Swiss manufacturer. In the coming years, Ingün will continue to grow at a tremendous pace and will thus need machines on which the requested micro-precision can be achieved in no time and at high flexibility. The SwissNano by Tornos provides Ingün with the ideal basis for this.

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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