

# deco magazine

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*Inspired by the legendary SAS 16, this improved version has undergone a complete mechanical overhaul to deliver unrivalled quality and precision in the production of small and precise parts in high volumes.*

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*“Since its introduction, the SwissDECO has become a benchmark for bar turning/milling centers.”*

**Jens Thing** Chief Sales Officer, Tornos

# Visit our stand at EMO Hannover 2023 from September 18–23

**Jens Thing** Chief Sales Officer, Tornos

An exceptional showcase for the world's manufacturing industry, EMO is always an opportunity for Tornos to shine and present some of the world's latest products in a setting that encourages innovation and the development of new ideas. Indeed, this international exhibition dedicated to metalworking technology always attracts the attention of professionals, experts and enthusiasts. The event focuses on the latest advances in machine tools, automation, control systems and innovative manufacturing solutions. Exhibitors from all over the world present their cutting-edge products and services, reflecting the constant evolution of the industry, and Tornos is no exception.

A unique platform for professional exchanges, meetings and discussions on emerging trends, EMO Hannover 2023 is above all an opportunity for Tornos to meet current and potential customers face-to-face and demonstrate the wide range of possibilities offered by our ingenious solutions.

In this respect, Tornos is once again pushing the limits to capture our customers interest with the development of a brand-new Swiss XT machine range, which will be unveiled for the first time at this major exhibition in Hannover. Designed specifically for complex-shaped parts used in the medical, hydraulic/pneumatic, automotive and job shop industries, the Swiss XT range offers a number of advantages that set it apart from the competition. These advantages start with the range's versatility which perfectly characterizes these different models, the Swiss XT 16 and 32. The range is available in 16 mm and 32 mm diameters bar capacity, and further the Swiss XT 16

has an option allowing up to a maximum diameter of 25.4 mm bar capacity. Available in two configurations, with eight or nine linear axes, by these specifications the Swiss XT range demonstrates its ability to handle a wide range of machining operations.

The Swiss XT's flexibility is also demonstrated by its ability to accommodate up to five live tool motors, including rotary tools suitable for high-end operations such as thread whirling, polygon milling and gear hobbing. The machine's modular work area allows the seamless integration of additional features, such as a plug-and-play B-axis, making it ideal for producing a wide range of parts. This versatile new range of machines perfectly complements the Tornos product portfolio.

Our stand at EMO Hannover 2023 will also feature the SwissDECO, which remains an incomparable tool, much appreciated by operators who use it with pleasure, fascinated by the machine's astonishing long and complex part capabilities. Since its introduction, the SwissDECO has become a benchmark for bar turning/milling centers. Its power and infinite possibilities make it possible to produce parts that were previously impossible to machine in one set-up. Fast and precise, it is particularly suited to the most demanding machining operations in all sorts of material.

When it comes to small parts and highest precision, customers need look no further than Tornos' SwissNano, which will also be on show on our stand at EMO. High-precision machining of tiny, complex parts places extreme demands on both operators

# Pinces et embouts Zangen und Endstücke Collets and end pieces

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and machines. With the SwissNano range of sliding headstock automatic lathes, Tornos has developed machines that are easy to use, space-saving and unbeatable in terms of precision.

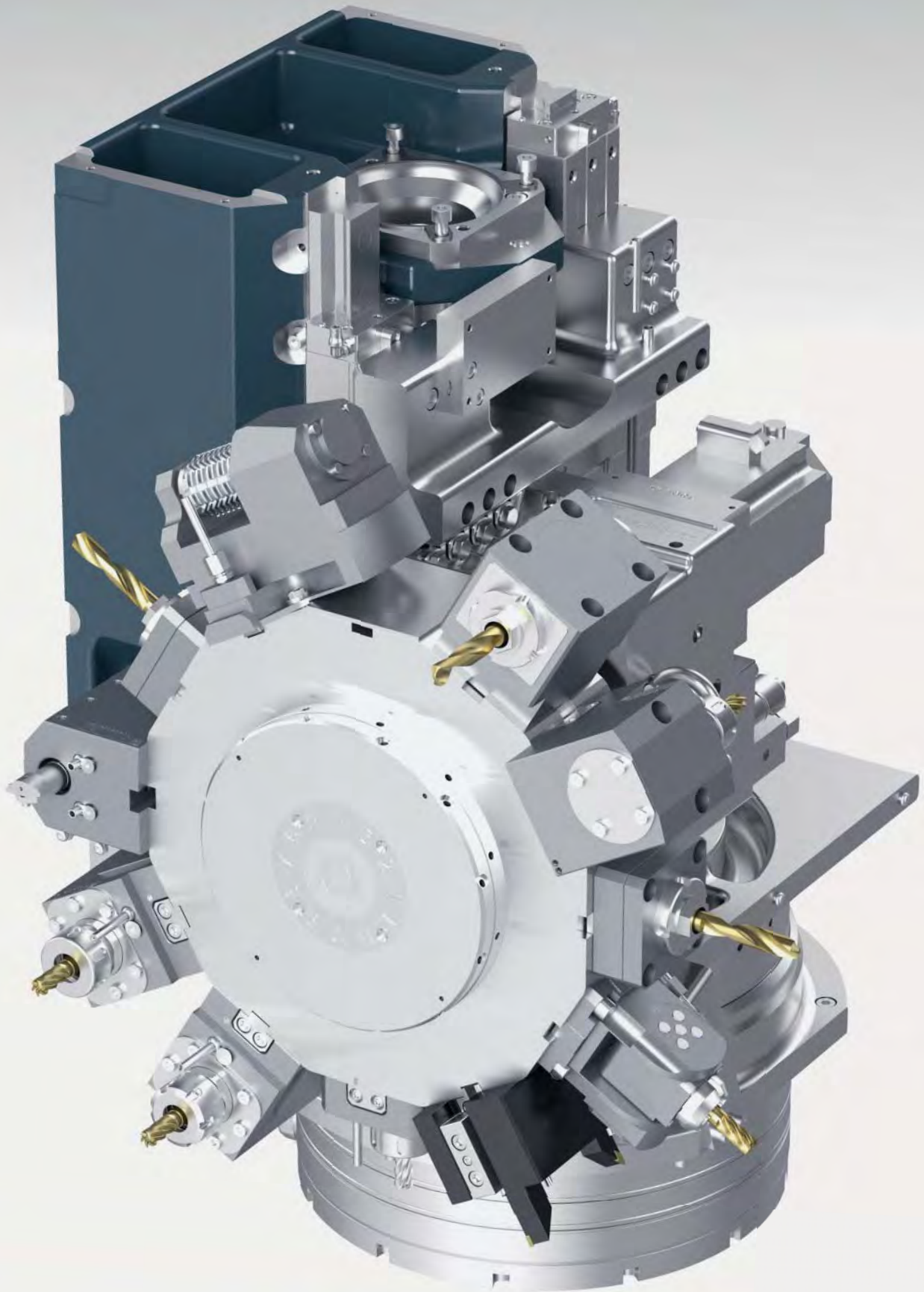
The SwissNano is designed to machine very small parts with the highest precision requirements. For example, thanks to its kinematics, the SwissNano 4 can produce two-thirds of the parts of a mechanical watch, from the simplest to the most complex, while guaranteeing excellent surface quality. This machine's performance isn't limited to watchmaking: It can also be used wherever maximum quality and precision are required, such as in the manufacture of e.g. dental implants, connectors and other. The kinematics ensure a perfect balance between rigidity and thermal stability, enabling the machine to reach operating temperature quickly, which is saving precious production time.

EMO Hannover 2023 is also an opportunity to discover the new technologies that are redefining metalworking, such as the integration of artificial intelligence, the Industrial Internet of Things (IIoT) and additive manufacturing. All these new technologies confirm Tornos' confidence in its TISIS programming and control software, which was launched at EMO and this year marks its 10<sup>th</sup> anniversary this year. This software is constantly evolving to become ever more efficient and reactive.

We look forward to welcoming you to our stand at EMO Hannover 2023, and we invite you to discover how committed Tornos is to sustainability, in particular by remanufacturing machines that have already served customers for more than 20 years and giving them a second life. We've had great success with our 25<sup>th</sup> anniversary campaign for the DECO 10 Plus and we intend to keep up the momentum with the SAS 16 Plus. You will be impressed by the performance and quality of these remanufactured machines.

In any case, this event remains an essential meeting place for companies wishing to strengthen their competitiveness by adopting the most advanced technologies. It fosters collaboration, innovation and the exchange of ideas that help shape the future of metalworking on a global scale, and Tornos is a long-standing and valued contributor to this process. Come and meet us, and together we'll design your workshop production equipment of the future, bringing together your needs, wishes and aspirations and our legendary know-how, all under one roof.





The SwissDECO's 12-position turret increases the machine's flexibility, offering a variety of options for each project.



TORNOS SWISSDECO:

*the machining solution for*  
**high-precision  
 medical parts**

The Tornos SwissDECO 26 Medtech is the new version of the SwissDECO 36 machine that has been specially designed for the medical industry in response to customer requests. It is equipped with new 26 mm spindles, which are perfectly suited to machining medical parts.

## TORNOS

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 tornos.com

### **New 26 mm diameter spindles**

*The diameter of an orthopaedic nail is about 16 mm, but its length varies from 80 to 480 mm. Currently, the SwissDECO has a spindle that can machine bars up to 42 mm and a Z1 stroke of 307 mm. Whilst these values certainly have their advantages, they are too large for machining medical parts.*

*After a study, it was decided to equip the machine with 26 mm spindles, which are better suited to machining medical parts, as they are also more compact. This new equipment is the key to the success of the new SwissDECO, as the smaller volume allows for a longer Z1 stroke. This is increased from 307 mm to 410 mm, which makes it possible to produce long parts in a single clamping, thus avoiding the risk of marking the part.*

*The counter spindle has also been increased to 26 mm to make it more compact. The latter can be fitted*



with a holder for three drill bits of different diameters. It is also possible to have a tailstock support on the counter-operation block. The tailstock is loaded/unloaded with the counter spindle, thereby providing additional support for machining with the turret. This option is also available on SwissDECO 36 machines.

#### A unique Z2 axis

With a stroke of 750 mm, the Z2-axis on which the B-axis mounted turret rests is quite simply unique. Combined with the turret, which allows any type of machining to be carried out at any angle, this feature gives the machine a clear competitive advantage.

#### New options to guarantee monitoring of production

Part quality is crucial to the medical industry as every part must be perfect, free of burrs, and made to tight tolerances. To respond to this need in detail, it is possible to include options that allow for the fine management of chip splitting, such as the Active Chip Breaker Plus from Tornos. It is also possible to opt for a torque monitoring function on each motor to detect tool wear. Worn tools are often a significant factor in the unit cost. Therefore, avoiding tap breakages and optimising the lifetime of tools is another benefit of using torque to monitor tools and processes. The limits for triggering the warning or alarm signal can be set automatically or individually by the user. The system is scalable and can therefore be adapted

to the needs of users. The permanent storage of recorded data allows for subsequent evaluations and assists in data traceability. It is also possible to opt for quick tool-change systems, such as Arno or W&F, which allow for quick and easy setups.

### **An optional 3D probe on the turret**

The SwissDECO is a platform adapted to Industry 4.0, and it is therefore important to be able to automatically and accurately measure the zero point that has specially been designed for difficult conditions.

*This turret-mounted sensor and 3D probing system is an effective solution for improving the machine's precision during production. Of course, these options are also available on the standard machines.*

Contact your nearest Tornos representative to find out more!

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The new Swiss XT is specially designed for parts with complex shapes.

TORNOS SWISS XT:

# Revolutionizing *Precision Machining*

In the world of precision machining, innovation is the key to staying ahead. Tornos, a leading manufacturer of CNC automatic lathes, has once again pushed the boundaries of technology with the introduction of their latest machine, the Swiss XT. Designed specifically for complex-shaped parts used in automotive, hydraulic/pneumatic equipment, and medical applications, the Swiss XT offers a host of benefits that set it apart from its competitors.

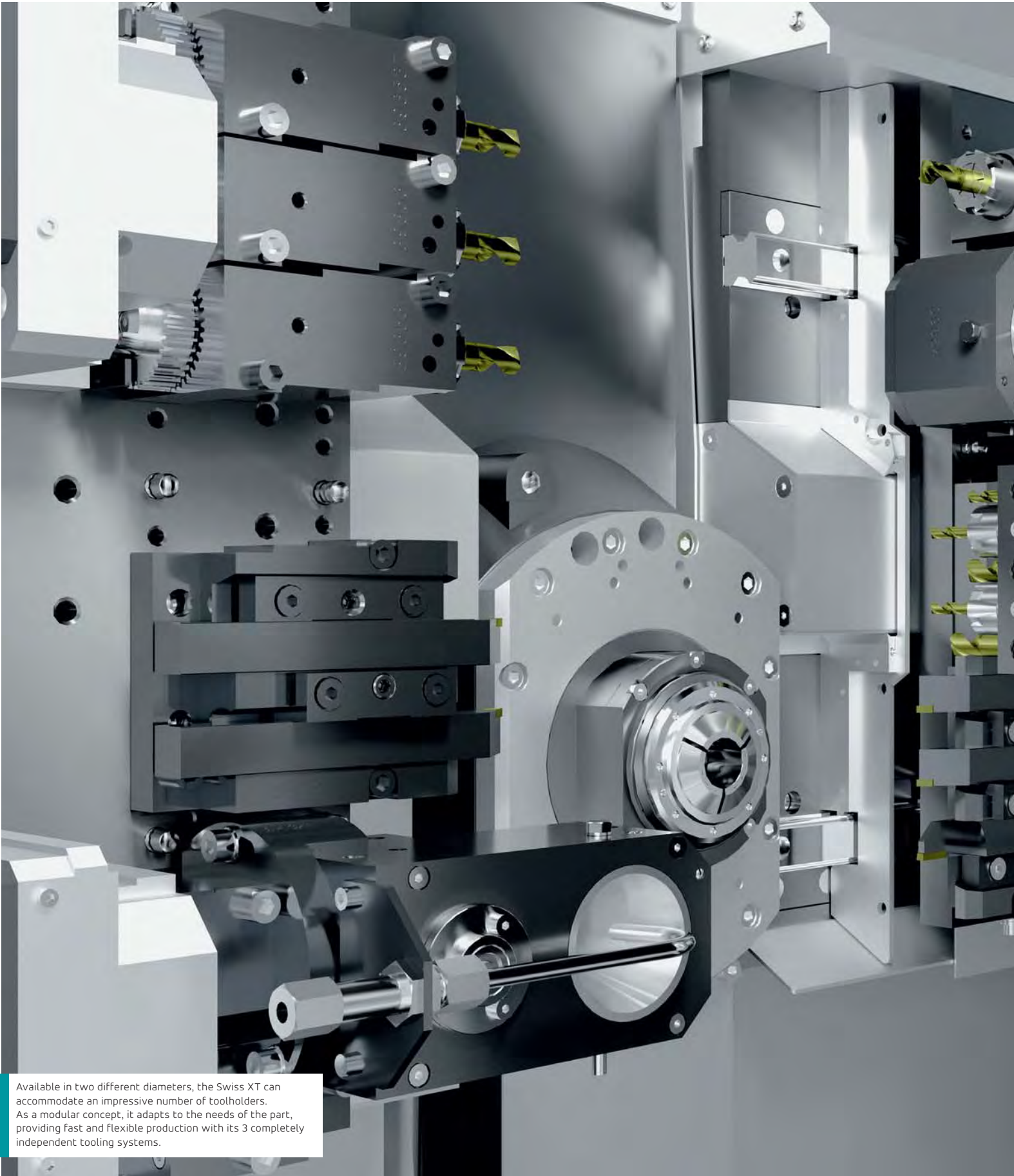
## TORNOS

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*Versatility is a standout feature of the Swiss XT, which comprises two distinct models:*

- *The Swiss XT 16, designed for bars up to 16 mm, boasts a maximum spindle rotation speed of 12,000 rpm.*
- › **Optionally**, *the Swiss XT 26 accommodates bars of up to 25.4 mm, with a spindle speed limited to 10,000 rpm in this configuration.*
- *The Swiss XT 32, built for bars up to 32 mm in diameter, impressively works on bars of 38 mm without the need for a guide bush.*

*Available in three different diameters - 16 mm, 25.4 mm, and 32 mm - and two configurations, 8 and 9 linear axes, the Swiss XT showcases its ability to handle a diverse range of machining operations. Notably, the 9-axis version includes a Z2 axis, facilitating deep drilling and balanced turning. The Swiss XT's unparalleled flexibility is evident through its capacity to accommodate up to five*



Available in two different diameters, the Swiss XT can accommodate an impressive number of toolholders. As a modular concept, it adapts to the needs of the part, providing fast and flexible production with its 3 completely independent tooling systems.





## TUNGSTEN CARBIDE AND DIAMOND PRECISION TOOLS

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PRECISION CARBIDE TOOLS





## “Another notable advantage of the Swiss XT is its interchangeable tooling with the Swiss DT and Swiss GT machines.”

*motors for live tooling, including rotating tools suitable for high-end operations such as thread whirling and gear hobbing. The machine’s modular machining area enables seamless integration of additional devices like thread whirling or angular milling tools, rendering it ideal for manufacturing an extensive array of parts.*

*A remarkable attribute of the Swiss XT is its capacity to operate without a guide bush. Particularly in the case of the 32 mm version, this allows the machine to accommodate bars up to 38 mm, thereby affording greater freedom and significantly reducing material waste. This feature is particularly advantageous when working with expensive materials or when focusing on short machining lengths.*

*Power and precision are at the core of the Swiss XT’s design. Equipped with highly powerful liquid-cooled spindles and ceramic bearings, both the counter spindle and main spindle boast a nominal power of 8.2 kW, with a peak power of up to 10.5 kW. The high torque output of 20 Nm (27 Nm peak) ensures efficient cutting across various applications. Depending on the model, the rotational speeds range from 8,000 to 12,000rpm, allowing for optimized performance in different machining scenarios.*

*Adding to its versatility, the Swiss XT features a plug-and-play B-axis. This optional feature can be easily adapted at any time, providing the ability to upgrade the machine’s capabilities as needed. The B-axis allows for the integration of rotating tools, a high-frequency spindle, and additional drilling and tapping operations, expanding the range of machining possibilities.*

*The double gang tool configuration of the Swiss XT further enhances its efficiency. With a “double gang tool” post and B-axis control for front machining, tool selection and preparation are streamlined, minimizing non-cutting time and reducing cycle times. This configuration also enables the machine to accommodate up to 40 front/back tools, with up to 12 tools dedicated to back machining. By optimizing the division of processes between the front and back machining, the Swiss XT promotes high productivity.*

*Another notable advantage of the Swiss XT is its interchangeable tooling with the Swiss DT and Swiss GT machines. Tornos has designed the Swiss XT to be compatible with the tooling systems of its predecessors, allowing manufacturers who already own Swiss DT or Swiss GT machines to leverage their existing tooling investments. This interchangeability not only simplifies the transition to the Swiss XT but also offers cost savings and flexibility in production planning. Users can seamlessly transfer their tooling setup and experience consistent machining performance across different machine models, ensuring a smooth integration of the Swiss XT into their existing production workflows.*

*The Swiss XT takes machining to the next level with its simultaneous 5-axis control using the B-axis. This capability allows for the flexible handling of complex machining tasks, including contouring on curved faces, opening up new possibilities for achieving intricate shapes.*

*Simultaneous machining with multiple tools is made possible by the Swiss XT’s two spindles and four tool posts. With the addition of the Z2 axis on tool post 2, the machine enables balanced cutting, drilling, and outer diameter cutting operations. This feature maximizes productivity and facilitates efficient multi-tool operations.*

*The Swiss XT supports three-tool machining on the front face, with the ability to perform additional back-tool machining on the independent back-tool post. By utilizing opposite tool posts, this configuration enhances productivity and expands the range of machining options.*

*Incorporating Tornos’ proprietary ACB (Active Chip Breaker) Plus technology, the Swiss XT minimizes*

chip entanglement issues during small-diameter deep-hole machining and difficult-to-cut materials. ACB involves synchronizing the X and Z servo axes with the spindle rotation, effectively breaking chips and improving overall machining efficiency.

Tornos has also prioritized enhanced operability in the design of the Swiss XT. The machine features a large 15-inch LCD touch panel screen with improved visibility and intuitive operation. The Tornos Machine Interface (TMI) simplifies complex operations such as working without a guide bush, production monitoring, and tool offset management. NC programs can be conveniently input/output using a USB flash drive or via the network using the TISIS connectivity pack.

Thanks to TISIS, operating the Swiss XT has never been easier, despite its complexity. TISIS offers an array of powerful features that simplify machine management and streamline production processes. The built-in ISO editor provides a user-friendly interface for programming, allowing operators to easily create, modify, and optimize machining operations. With the Gantt diagram, users can visualize the

critical path of the part across the three channels of the machine, enabling efficient production planning and resource allocation. The comprehensive library of machining operations facilitates easy cut-and-paste functionality, saving time and effort in programming.

Furthermore, TISIS allows for virtual setup on a PC, ensuring compatibility and minimizing errors. Programming can be performed in masked time, allowing operators to work on multiple tasks simultaneously. The 2D simulation feature enables operators to visualize and verify tool trajectories, ensuring accurate and optimized machining processes.

TISIS truly simplifies the complexity of the Swiss XT. By simply opening a new part file, all the feeding and cutting operations are pre-defined, relieving the operator of the burden of manually configuring each process. With TISIS, operators can focus on the part itself, knowing that the machine is intelligently programmed and optimized for efficient and precise production. The intuitive features of TISIS take the complexity out of managing the Swiss XT, empowering operators to



achieve maximum productivity with ease. Equipped with a range of standard features including a cut-off tool breakage detector, workpiece conveyor, coolant tank with a level detector, central lubrication device, and spindle cooling device, the Swiss XT prioritizes productivity and ease of use.

The machine's layout provides an open operating space for excellent usability, while its compact design ensures efficient use of floor area. The Swiss XT offers various specifications and options, including guide bushing and guide bushing-less types, spindle speed control, tool capacity, rapid feed rates, and motor outputs. These customizable options allow users to tailor the machine to their specific machining requirements.

The Swiss XT also comes with a range of standard and optional NC functions that further enhance its capabilities. Standard features include on-machine program check, interference check, collision detection, spindle speed fluctuation detection, and tool nose radius compensation. Optional functions, such as circular thread cutting, milling interpolation, and high-speed synchronized tapping, provide additional flexibility and advanced capabilities.

With its cutting-edge features, the Tornos Swiss XT is a game-changer in the world of precision machining. Its versatility, power, and precision make it an ideal choice for manufacturing complex-shaped parts used in various industries. Whether it's automotive, hydraulic/pneumatic equipment or medical applications, the Swiss XT delivers unrivalled performance, productivity, and machining capabilities. With Tornos' commitment to innovation and customer satisfaction, the Swiss XT is set to revolutionize precision machining processes.

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## **NEOSWISS** INDEXABLE HEADS

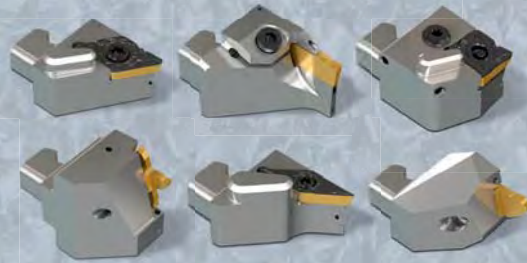
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Manufacturing dental implants requires exemplary expertise and precision.

# Tornos sets new standards *in the manufacture of dental implants*

The production of dental implants is a delicate task that requires great precision and attention to detail at every stage of the manufacturing process. Tornos has developed machines specifically designed to meet the requirements of this industry.

## TORNOS

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*Tornos machines, including the Tornos EvoDECO 10, SwissNano 7, Swiss GT 13 and Swiss DT 13 HP, offer revolutionary features for the manufacture of high-quality dental implants with complex designs and very tight tolerances. In particular, the addition of the optional B-axis on the Swiss DT 13 and the new Swiss GT 13 B allows many complex machining operations to be performed, saving time and resources by eliminating multiple set-ups.*

*However, Tornos does not stop there. The company has developed the MultiSwiss 6x16 machine, which offers a considerable competitive advantage in the dental implant industry. This machine is capable of producing dental implants in just 35 seconds per part, which represents a productivity gain of over 77% compared to traditional sliding headstock lathes.*

*In addition to its high productivity, the MultiSwiss offers a host of other benefits, such as reduced personnel and material costs, improved surface finish*

and uniformity, better quality, faster response times to increases in demand, reduced energy consumption and noise levels, and simplified installation and maintenance.

Whether you are a small business looking to enter the dental sector or an established player looking to maximise your efficiency and profitability, Tornos has the solution you are looking for. Thanks to the precision and reliability of Tornos machines,

you can be sure of producing high-quality dental implants that meet your customers' requirements. Don't wait to upgrade your manufacturing capabilities: start enjoying the benefits today!

Discover some examples of our work and our star machines.

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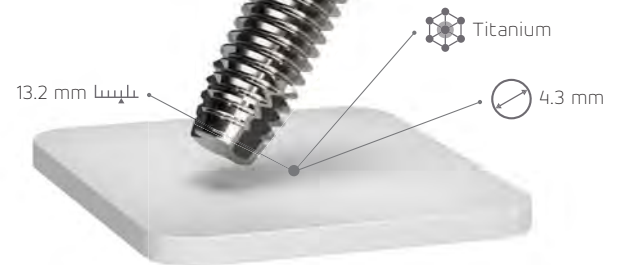
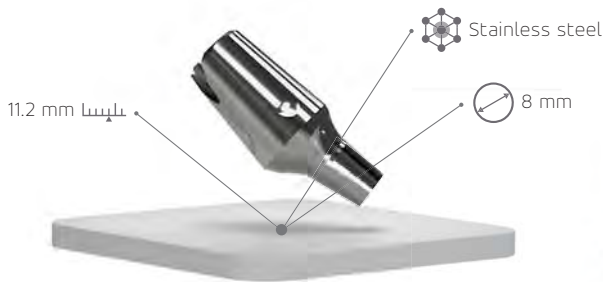
## EvoDECO 10

- Maximum diameter ..... **10 mm**
- Number of linear axes..... **10**
- Number of independent tool systems..... **4**
- Total number of tool positions..... **22**
- Positions for rotating tools..... **11**



## SwissNano 7

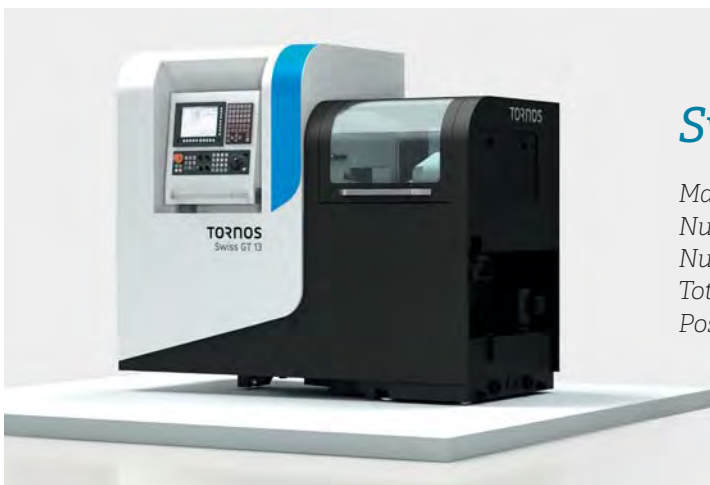
Maximum diameter .....	7 mm
Number of linear axes.....	6
Number of independent tool systems.....	2
Total number of tool positions.....	20
Positions for rotating tools.....	11



Length (mm)

Material

Diameter (mm)



## Swiss GT 13

Maximum diameter .....	13 mm
Number of linear axes.....	6
Number of independent tool systems.....	2
Total number of tool positions.....	28
Positions for rotating tools.....	14

## **Diametal:** *The solution for optimised and efficient dental implant production*

*Established in Biel in 1936, Diametal specialises in the development and manufacture of hard metal, diamond and ceramic tools. The company can place its trust in its Application Centre and the engineers working there to design solutions tailored to the needs of its customers, especially those in the dental industry.*

### **Dental implant market**

*The rapidly growing global market for dental implants is driven by the increasingly spectacular innovations made by manufacturers in the sector. Indeed, the considerable increase in demand is largely due to developments in technology and surgical techniques, which have made these components more reliable and affordable.*

### **Diametal and the dental medical industry**

*The tools are commonly used in the dental and medical industry for the production of implants. They are used to turn, mill and drill the general shapes of implants and dental prostheses, including*

*internal and external threads, Torx® sockets or any other operations required for the various stages of production.*

*All of the tools are manufactured from high-quality materials known for their durability, wear resistance and ability to maintain precise tolerances in difficult production environments.*

*The ability of the company to offer a complete range of standardised tools for the production of dental prostheses helps implant manufacturers to optimise their production and improve the quality of their products. By using such tools for every step of the production process, manufacturers can produce accurate and reliable dental prostheses that meet the highest safety and quality standards.*

### **The best solution for Diametal**

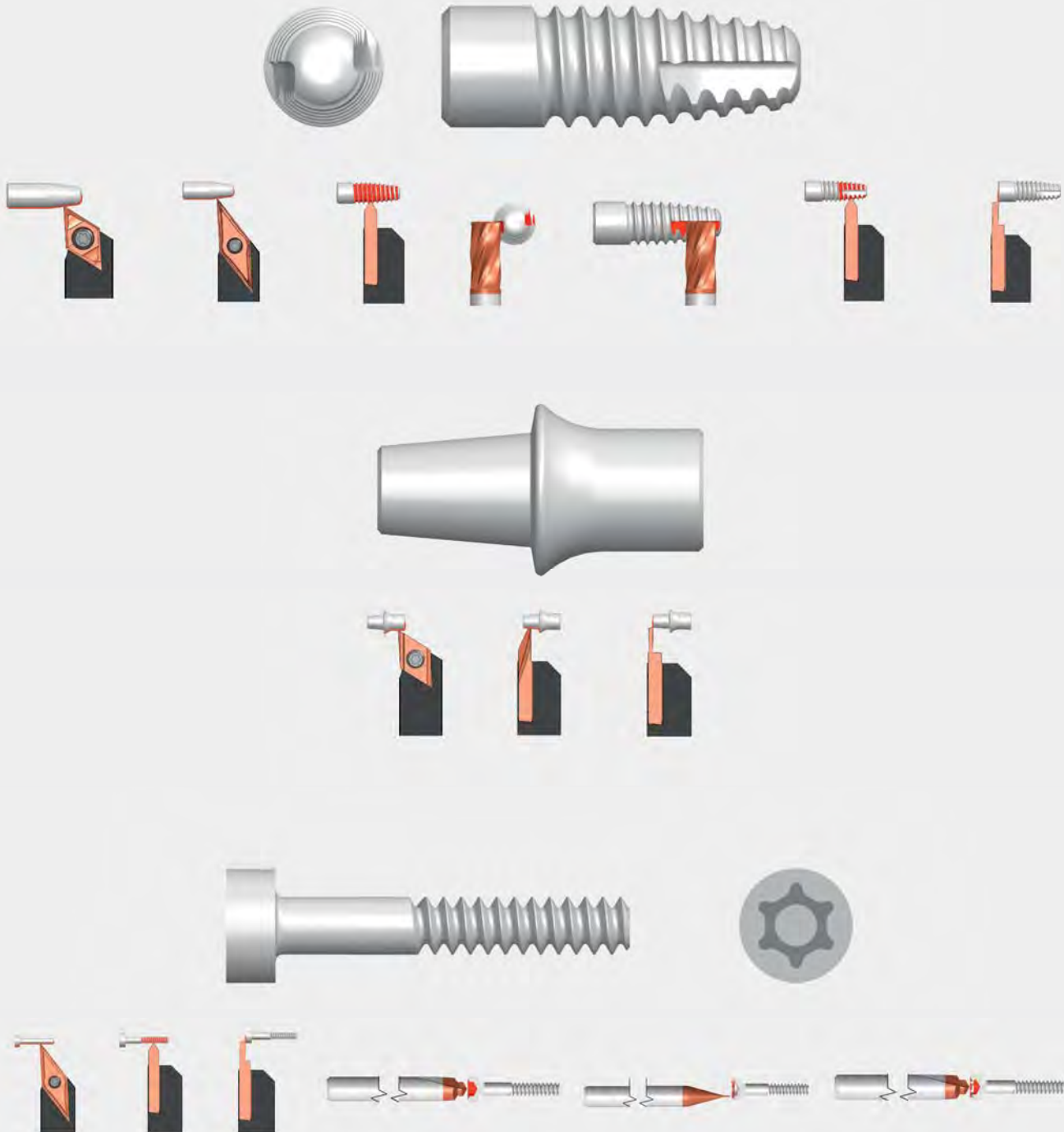
*Diametal offers a global solution to improve the speed of dental implant manufacturing by combining a milling cutter and a Torx® drill bit. This technology allows Torx® sockets to be produced without burrs, thus considerably reducing finishing time and costs. As a result, the number of operations to be performed on the implants is reduced, as is the number of machines used throughout the manufacturing process.*

**Discover the  
BEST SOLUTION for  
the dental market**





## The different stages of machining the implant





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# RIVEAL

TECHNOLOGIES LLC



Raymond Rivera (right) and his partner, Ramon L. Rivera, have made their company, Riveal Technologies LLC, a household name.

## TURNING TO TORNOS

# Riveal Technologies relies on Swiss GT *and Swiss DT solutions*

If anyone knows Tornos machines—and their capabilities—inside and out, it's a Tornos application engineer. So, it's no surprise that former Tornos application engineer Raymond Rivera and his partner, former Tornos service engineer Ramon L. Rivera, turned to Tornos when they decided to open their own business, Riveal Technologies in 2014. They recently underscored their confidence in Tornos' solutions, choosing five Swiss GT 13 and two Swiss DT 13 Swiss-type automatic lathes.



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*The computer numerical control (CNC) Swiss-type machine shop in North Haven, Connecticut (United States) specializes in machining services for a variety of industries—including medical, electronics, and aerospace. Riveal Technologies focuses on creating lasting relationships built on quality and trust. With the company name standing for detail-oriented work and on-time solutions from custom part machining to prototyping, there's little room for errors or do-overs.*

### **A true machinist**

*Rivera, who is Riveal Technologies' General Manager, knows what he's talking about when it comes to metalworking: He began working in the industry when he was 17 and got a job in the sheet metal shop that employed his father.*

*"I deburred, washed, and plated custom sheet metal parts," he explained. "That's where I saw how a shop is run to do custom prototypes and short runs of parts. As I worked there, I took a night school class to learn machining. From there, I worked for various aerospace, electronics and medical device companies and used a variety of machining technologies such as grinding, manual production and manual machines. From working for these companies, I learned what a sliding headstock lathe—or Swiss-type lathe—was. From there, I kept working in Swiss-type CNC machining."*

*When Rivera joined Tornos as an application engineer, he was already well-versed in the capabilities of the DECO range of machines and was happy to encounter the company's DELTA line.*

*"I liked the way the DELTA range had similarities to the DECOs; Tornos likes to use the same style of programming and the codes and so on, and that makes it easier to go from one platform to another," he said.*



“We see a lot of happy customers when the prototype is done and it works—you can see their joy.”

**Raymond Rivera**

General Manager, Riveal Technologies

*When Rivera and his partner decided to strike out on their own, he knew what he needed.*

*“I thought, ‘If I can find a Tornos DELTA on the used machine market, I’ll pick one up,’” he recalled. And that’s exactly what he did.*

**Moving up to the Swiss GT and Swiss DT**

*Thirteen years after starting the business, Rivera and his partner scaled up their Tornos machine fleet in a big way, choosing five Swiss GT 13 machines and two Swiss DT 13s.*

*The Swiss GT 13 is renowned for its versatility: Ergonomic and modular, it can be used with or without a guide bush and can accommodate up to 30 tools, including 12 rotating tools. Its Y axis offers greatly increased machining capability in secondary operation and allows some complex workpieces to be produced without reworking. At the same time, the Swiss GT 13 is simple to adjust.*

*Tornos Swiss DT 13 brings versatility, modularity, efficiency, and quality to the table, allowing users to increase their flexibility tenfold. The machine’s base is designed to maximize productivity, with a fully modular machining area that can accommodate any type of tool holder; drilling, milling, thread whirling—an application pioneered by Tornos—are just a few examples of this solution’s astonishing flexibility.*





*“We are using all of these new machines for dedicated production for now. The Swiss GT and Swiss DT platforms are gaining popularity and with them, we can hire recent vocational school graduates who are eager to work on Tornos machines,” Rivera noted. “When customers visit us and see the machines running—especially the Swiss GT with its window view into the machine—they comment on the look of the machine and the lighting in the machine. I also use as a selling point that the programs use the torque limiting features of each axis and are used to assist in unattended machining.”*

*Rivera appreciates the Tornos Machine Interface (TMI) system and the ease with which the Swiss GT and Swiss DT can be programmed.*

*“Tornos’ use of multiple sub-routines in the program to do background calculations eliminates the need to do manual calculations; for example, part pick-up distance,” he said. “Other machines sometimes make the operator manually calculate when switching from one part to the next.”*

**Customer-centric orientation**

*The Swiss GT and Swiss DT machines are already proving their value to Riveal Technologies, positioning the company to not only meet but exceed its promises for on-time production.*

*“When we began, it was hard to get our foot in the door to a production order right from the start. The customer would say, ‘We need 10 pieces of this,’ and we do it, and then they come back maybe with revisions and then say, ‘Give us production quotes and production volumes,’” said Rivera. “For example, we have a purchase order right now for half a million pieces and that job literally started with 50 pieces.”*

*Riveal Technologies’ customer-centric orientation means that design engineers can actually participate in the part development process.*





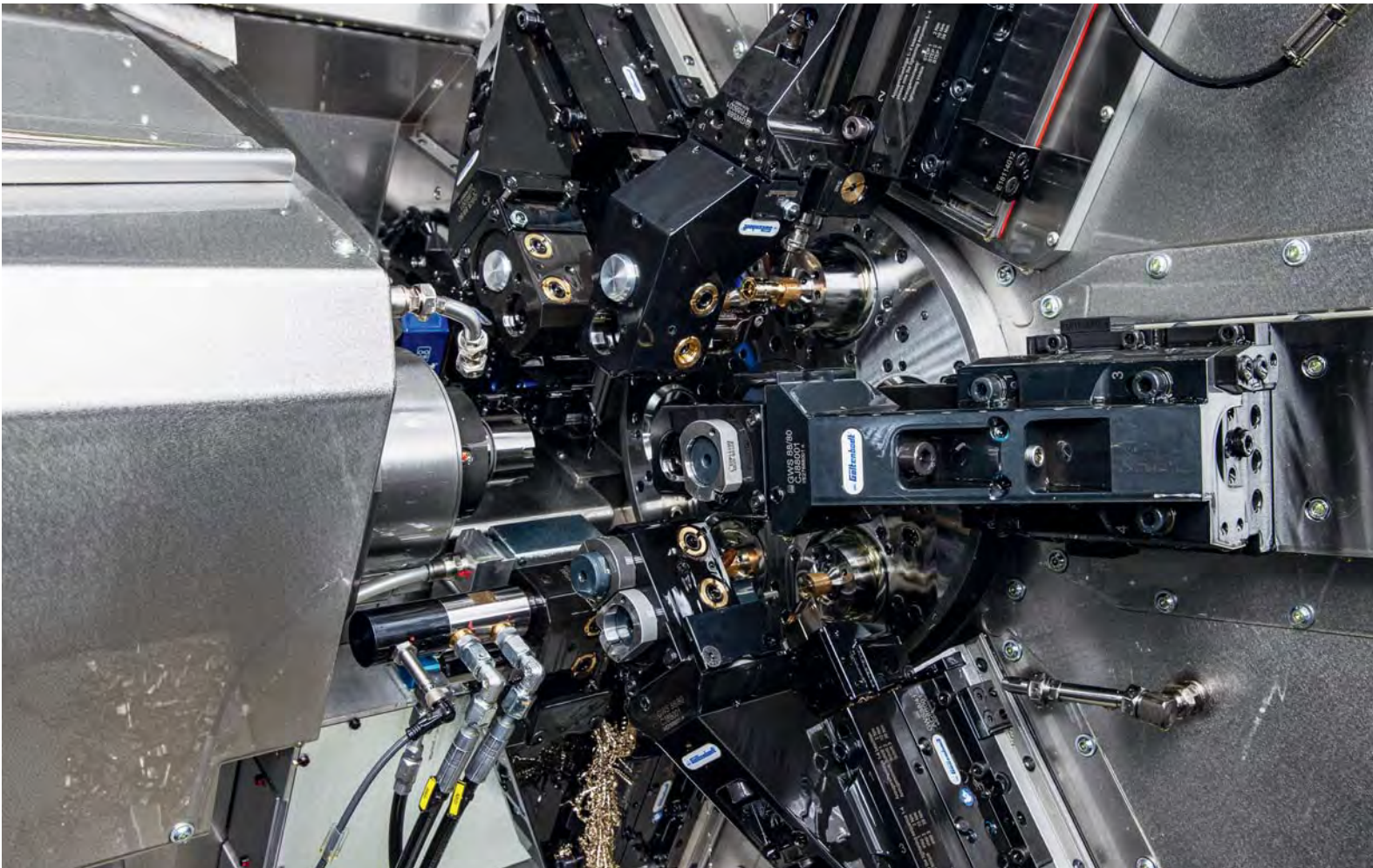
*"Many design engineers are now working from home, so they'll design parts but they can't physically touch or work with them, so they will come to us. Once they see the part, they may realize, 'Oh, I need to change this a little,' and we can do that," said Rivera. "So, instead of waiting three to four months to get a prototype that's not what they wanted, with us they can participate in the development. That's one great aspect of what we do here: bringing people's ideas to life. We see a lot of happy customers when the prototype is done and it works—you can see their joy."*

*While Riveal Technologies' vastly expanded Tornos machine fleet provides a sound foundation for future growth, Rivera said he can envision a Tornos EvoDECO 10/10 in the company's future.*

*"I was known for being very good at using the DECO machines, with regard to operation and TB-DECO programming," he said. "I would like to get an EvoDECO 10/10. We make a lot of electrical contacts and I believe we can increase productivity with multiple tools in the cut."*

[rivealtech.com](http://rivealtech.com)





From left to right: Patrick Schneider from Tornos in conversation with Hermann Reinhardt from Horn.

# Multispindle turning at the highest level

For the Horn Technology Days, the Tübingen-based tool specialist and the Swiss turning machine manufacturer Tornos set themselves an ambitious goal: to produce a complex cable cylinder from ODU made of lead-free brass on a MultiSwiss 6x16. They wanted to prove that a typical long-turned part can be produced even more precisely and productively with the right tools on a CNC multispindle machine.

*Connectors from ODU are used in a wide range of demanding applications with the highest quality and safety requirements. This is why ODU pursues a consistent strategy that encompasses all stages of the development and production process.*

*A suitable connection system is always an optimal combination of three central components: connectors, connection technology and suitable cables. A connector can only meet the requirements of a customer's application if it is combined with the right cable and a connection that is reliably designed for the process. For example, in applications where high currents or temperatures are involved, high data rates are transmitted over copper or fibre optic cables, and sealing is important. It is not enough to simply offer a high-quality connector and ignore the connection technology or cable assembly. Important elements in this chain are the cable cylinders, which ODU used to manufacture from brass alloys and aluminium. As part of its sustainability strategy, the*

# “The tooling specialists at Horn are enthusiastic about the performance of the MultiSwiss”

*company plans to manufacture them from lead-free brass in the future. However, this poses several unprecedented challenges.*

*The lead in the copper alloys provides good chip breaking and has a slight lubricating effect. This reduces friction, which results in less heat being generated in the machining process. If it is missing, the machinability deteriorates decisively and the process reliability drops rapidly. In addition, ODU manufactures cable cylinders in small diameters with a high degree of complexity. Due to the filigree geometry, only low cutting forces can be applied during turning. In addition, the small diameters do not allow high cutting speeds, yet large quantities are required.*

## **New machining strategy developed in four weeks**

*With this in mind, Horn and Tornos technologists developed a completely new strategy in just four weeks. Conventional standard tools are not always suitable for machining lead-free brass. They tend to produce long stripes and tangled chips, which hinder the smooth running of the process. The project team, therefore, decided to use very filigree tools from Horn's product portfolio and quickly got the problem under control. Together, they developed a 13-tool high-performance machining process. First, a form drill was used for drilling, internal and external turning, pre-piercing, grooving, flattening the lateral surface, thread chasing and, finally, face turning with  $\mu$ -precision.*



Tool grooving with the Horn Supermini system. It has a cutting edge equipped with a chip-forming geometry that enables lead-free materials that tend to produce long chips to be machined.



A mark is made on the side surface with the DSA system.



The form groove is made with the 315 System, which is characterized by high changeover accuracy.



The S224 prism-guided precision insert is used for threading.

Each operation was segmented and programmed on the MultiSwiss control. This control is easy to use and offers several helpful features. For example, the drilling operation, which determines the cycle time, is displayed. The other operations can be aligned with it and the overall cycle time can be optimized. In the short time available, the team achieved a cycle time of less than 15 seconds and 3.67 parts per minute. By EMO Hannover 2023 (September 18-23), the two project partners want to improve these values even further by using coated tools and optimized tool geometries. The tooling specialists at Horn are enthusiastic about the performance of the MultiSwiss. The hydrostatically mounted spindles

extend the tool life, the easy access to the work area enables trouble-free setup, and the machine runs very quietly.

The test setup at the Technology Days showed that one MultiSwiss can replace up to six conventional sliding headstock lathes and runs much more reliably. This saves labour, which is important in these times of skilled labour shortages, and saves about 70m<sup>2</sup> of floor space. In addition, maintenance intervals are reduced by a factor of 5 and productivity per m<sup>2</sup> is significantly increased. Both project partners are convinced that the MultiSwiss, combined with the right tools, can be a successful alternative for many users who have not yet considered using a multispindle press.



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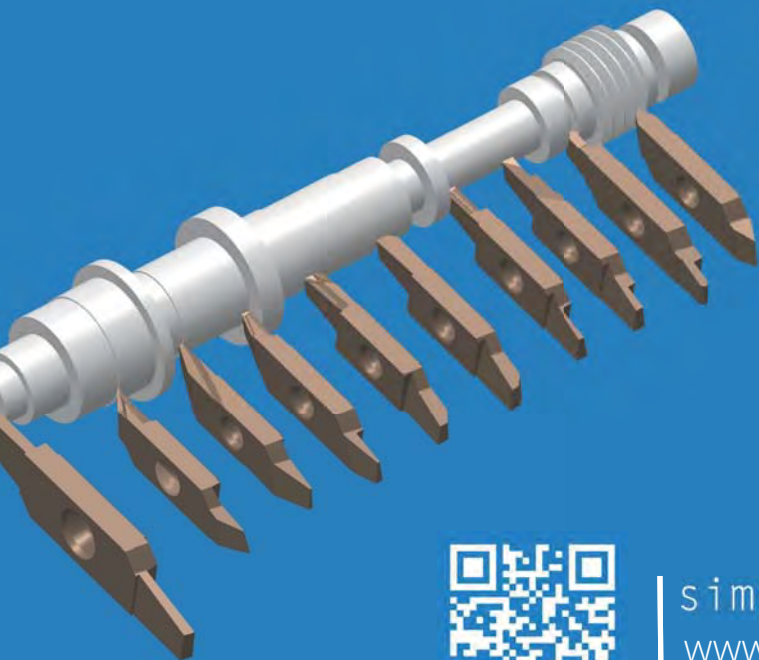


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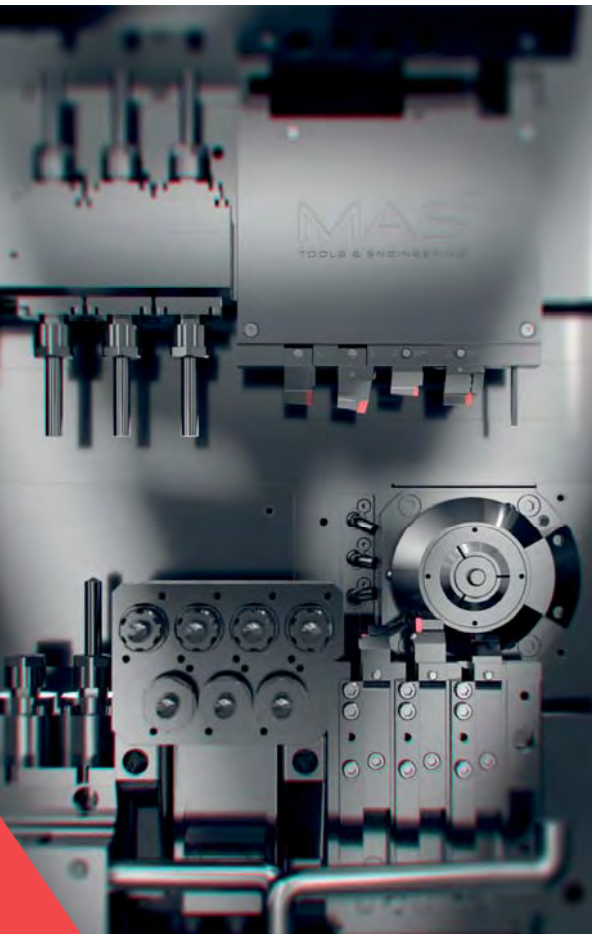
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### A complete mechanical overhaul

*The SAS 16 Plus has been meticulously rebuilt with exceptional attention to detail. Every mechanical part was carefully disassembled, cleaned and replaced where necessary. From the barrel to the locking area to the slides, all parts have been overhauled to ensure optimal operation.*

*But that's not all. The SAS 16 Plus goes beyond the mechanical overhaul to offer significant improvements. The numerical control has been completely renewed with the addition of a FANUC oi Model F control, offering unrivalled precision and flexibility. In addition, the spindle motor and camshaft have been overhauled to ensure reliable, high-performance operation.*

*To facilitate chip evacuation, the chip tray has been enlarged, allowing continuous production without interruption. Machine and enclosure sealing has also been improved to maintain a clean and safe environment.*

*The SAS 16 Plus also incorporates new features for optimal utilization. A new coolant pump with a higher flow rate ensures efficient cooling during cutting operations. The air distribution plate has been redesigned for improved ergonomics and easier operation. What's more, the central lubrication system has been redesigned to reduce maintenance and allow you to focus on production.*

*Flexibility is the name of the game with the SAS 16 Plus. You can add up to 2 digitized cross slides, expanding the machine's capabilities and improving accuracy. With an optional spindle encoder, you can perform threading operations with exceptional precision.*





*What's more, with the Fanuc Oi-F control, you can equip your machine with a direct tapping motor that replaces the mechanical device with tapping-tapping frictions. This means you can electronically program the tapping speeds to suit your needs.*

*The SAS 16 Plus offers exceptional flexibility and opens up new possibilities for manufacturers. This machine can be transformed into a hybrid multispindle that combines both cam and CNC technology, giving it a unique competitive edge.*

*By choosing a hybrid configuration, you get the best of both worlds. Complex operations can be freely programmed and executed with great precision thanks to NC while retaining the simplicity and efficiency of cam operation. What's more, the use of standard tools reduces tooling costs, while quick-change toolholders allow fast and easy tool changes, reducing setup times.*

*When you choose the SAS 16 Plus, you'll get a powerful, versatile machine that's ready to take on any challenge. Whether you need extremely high productivity or unrivalled precision, this machine will meet your needs.*

*Don't miss the opportunity to discover the SAS 16 Plus, the machine that is revolutionizing the production of small, precise parts in long runs. With its remarkable enhancements and proven reliability, it's ready to take you to new heights of performance.*

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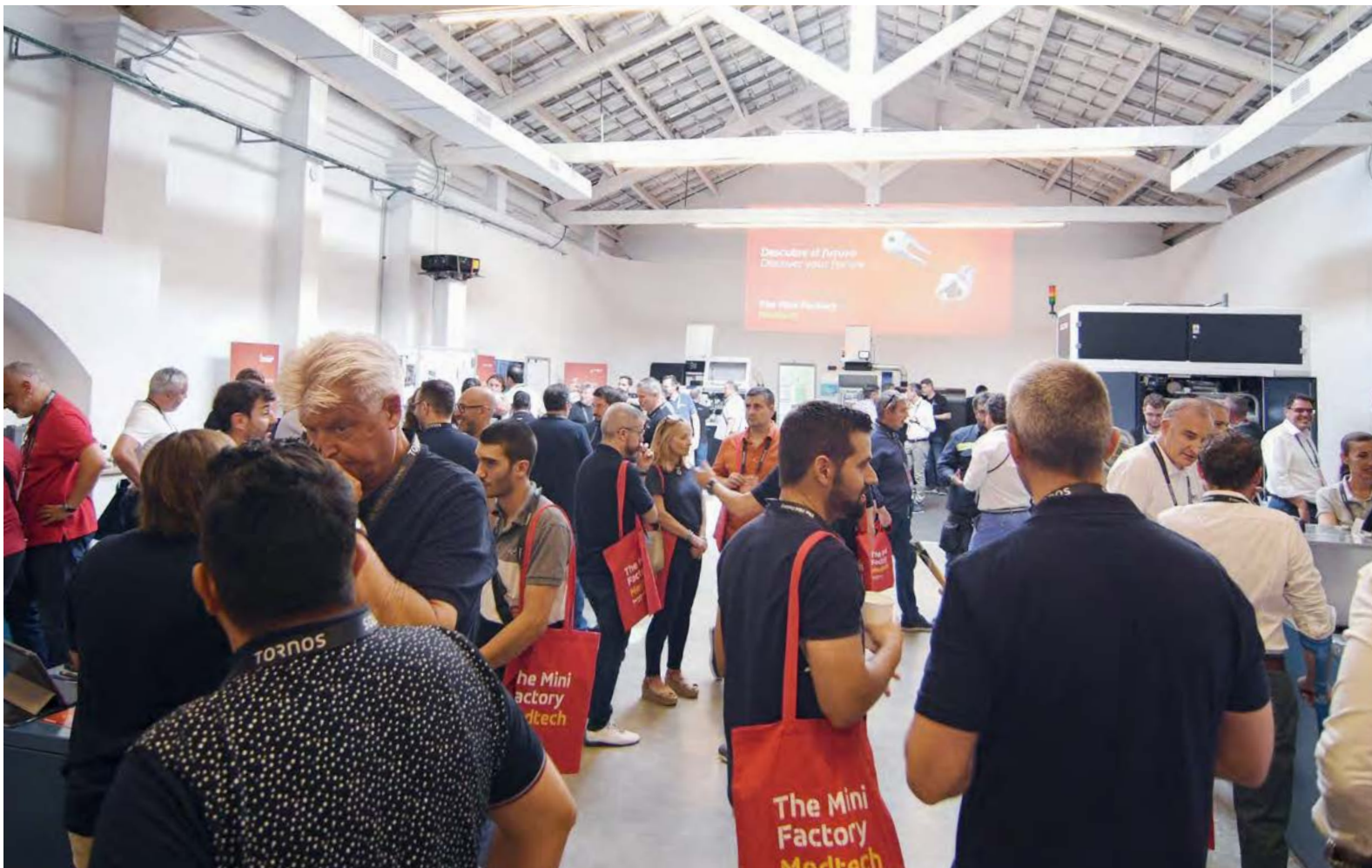


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Together with 13 other partners, Tornos Iberica organized the first Mini Factory in Barcelona.

Barcelona - Tornos Iberica's Mini Factory  
surprises and delights

# A resounding success *through synergy*

Organized by Tornos Iberica in collaboration with 13 other partners, the Mini Factory was a resounding success, attracting 350 people - both loyal customers and prospects. It demonstrated the quality of Tornos Ibérica and its extensive network.

## TORNOS

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*Aware that traditional trade shows in the machine tool industry are not always as successful as expected, Arnau Macabies, the Managing Director of Tornos Iberica, decided to innovate with a unique concept that had never been seen before. The Mini Factory was an exclusive, immersive experience reserved by invitation only for the customers of these various partners, to put each partner's products into practice to demonstrate their efficiency and benefits.*

*This miniature factory of the future allowed guests to discover the complete process of manufacturing parts in the medical sector, from concept and design to materials and final production. Tornos Iberica and its partners went one step further and presented finished parts that had been measured, machined and cleaned.*

*They chose to produce two parts together for the MedTech sector, which is expanding rapidly due to the ageing population. Among the many possi-*

ble parts in this vast sector, examples such as an angular dental abutment and an orthopaedic part were chosen as emblematic. The entire Mini Factory process takes place in real-time, from programming with Esprit CAM software to machining on Tornos machines (Swiss DT 26/6 HP + Swiss GT 26B interpolable), including cleaning and surface treatment. All the physical elements required, such as peripherals, materials, tools, measuring systems and oil, are provided by the Tornos partners involved in this miniature factory of the future, enabling them to put their innovations into practice.

Located in the heart of Barcelona, opposite the Sagrada Familia cathedral (visible from the room chosen for the occasion), this factory of the future

has been able to meet the challenges faced by today's manufacturers. By observing the production of parts live, the participants were exposed to concrete, tangible elements, which they greatly enjoyed. Above all, it gave them a better understanding of the possibilities offered by Tornos machines in a complete environment where all the players play their part to perfection.

"We've been able to show what we're capable of using technologies we've never used before," enthuses Arnau Macabies. For example, the eccentric turning of the cone had the guests literally on the edge of their seats, a sequence of operations carried out using CAM Esprit programming, as well as machining with 5-axis interpolation and

“We’ve been able to show what we’re capable of using technologies we’ve never used before.”







counter-operation workpiece pick-up on the connecting hexagon. Techniques and methods are rarely offered by our competitors, as they require a great deal of knowledge and hours of development. The Mini Factory has also been equipped with a Sylvac SCAN, a machine that automates all dimensional checks. Thanks to this automatic control, the corrections (offsets) are sent directly to the Tornos machine, which integrates them and corrects the tool positions, and therefore the resulting dimensions, virtually by itself. This saves time (and therefore money) and produces perfect parts that could have been sold directly on the spot if this were the function of this miniature factory.

“We are particularly proud to have been able to offer this experience to our current and future customers, and we are ready to repeat it in the future,” continues Arnau Macabies. What he is most pleased about is that this initiative has put Tornos Ibérica back in pole position when it comes to cutting-edge bar-turning techniques. “The ideas developed here will certainly germinate in the minds of the visitors and they will come back to us to give them substance. We want to present ourselves in our market as a supplier not only of machines but also of technical solutions”, concludes Arnau Macabies, Managing Director of Tornos Iberica.

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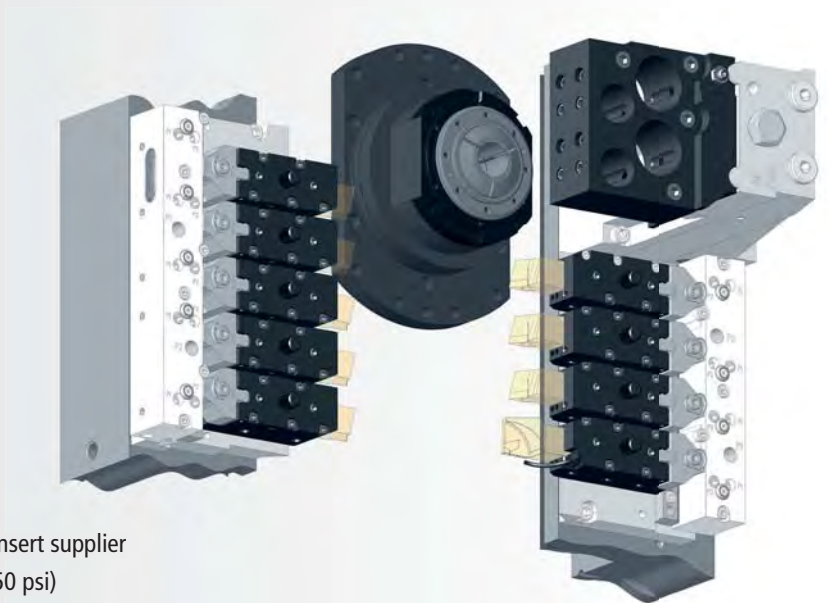


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