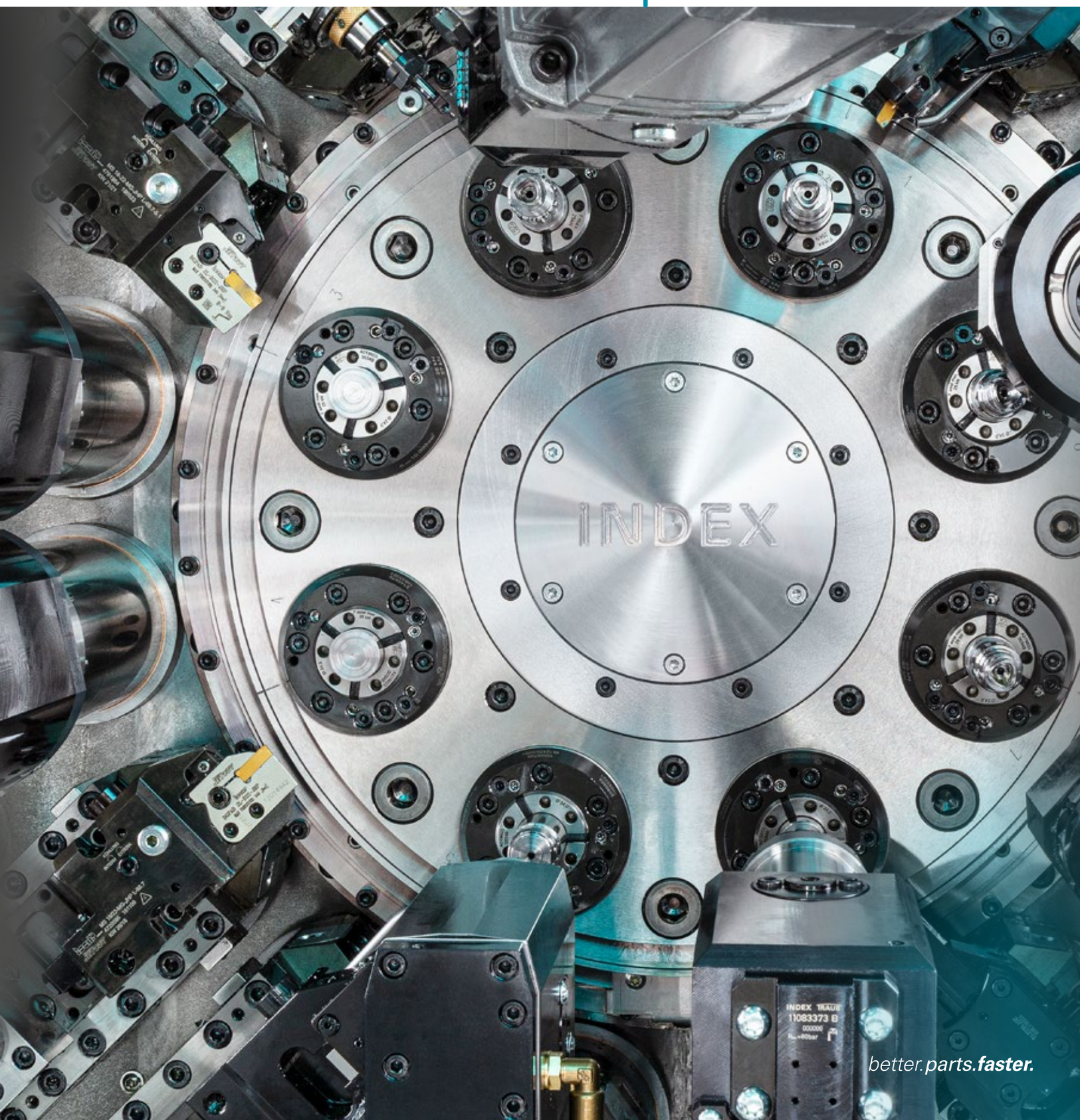
The customer magazine of the INDEX Group
Issue 11 2024/25

110 YEARS PRODUCTION TURNING INDEX

INDEX

TURNINGpoint



better.parts.faster.

TURNINGpoint
Issue 11 2024/25

Highlights

Reiner Hammerl, Dr. Dirk Prust and Roberto Deger
INDEX Group executive management (from left)

Dear customers and friends of the company:

Quo vadis, economy? This question has been on the minds of everyone in the metalworking industry for many months now. And indeed, there are currently very tangible signs of economic recovery. Besides the stabilization and reduction of key interest rates, which will have positive effects even at the consumer level, the stock markets have been trending upward for some time, and industries such as aerospace and defense are prospering. Even in the automotive sector, the reluctance to invest seems to be easing, albeit slowly.

From the perspective of a machine tool manufacturer, an investment gap has become apparent in recent months—investments are lower than the depreciation of installed machines, thus, there will be a corresponding backlog in demand. This is also confirmed by well-known forecasting institutes.

Once this hesitation to invest dissolves, the principle of "the early bird catches the worm" will once again prove true. In light of this, it is crucial to act now and set the course to ensure quick responsiveness to market demands.

Our new and further developments, which we will showcase at IMTS in Chicago and AMB in Stuttgart this fall, are specifically designed to enhance the flexibility and efficiency our customers require: For example, the G-series turn-mill centers will be expanded with a cost-effective "Compact" version of the INDEX G320, and the third-generation INDEX G200 is now available with a B axis on the upper turret. In the multi-spindle segment, we are unveiling the INDEX MS24-8—the evolutionary and consistent advancement of the highly successful INDEX MS22-8. New production techniques for machining scroll compressors and manufacturing dental implants on INDEX multi-spindle machines provide productivity gains similar to the technologies of high-speed thread milling and turning of internal and external polygons—even including the turning of Torx profiles. The range of new products is rounded out by the cost and price-optimized TRAUB TNL32 compact Swiss automatic lathe and the INDEX C200 production turning machine.

Let our innovations inspire—we look forward to engaging conversations with you!

Welcome aboard

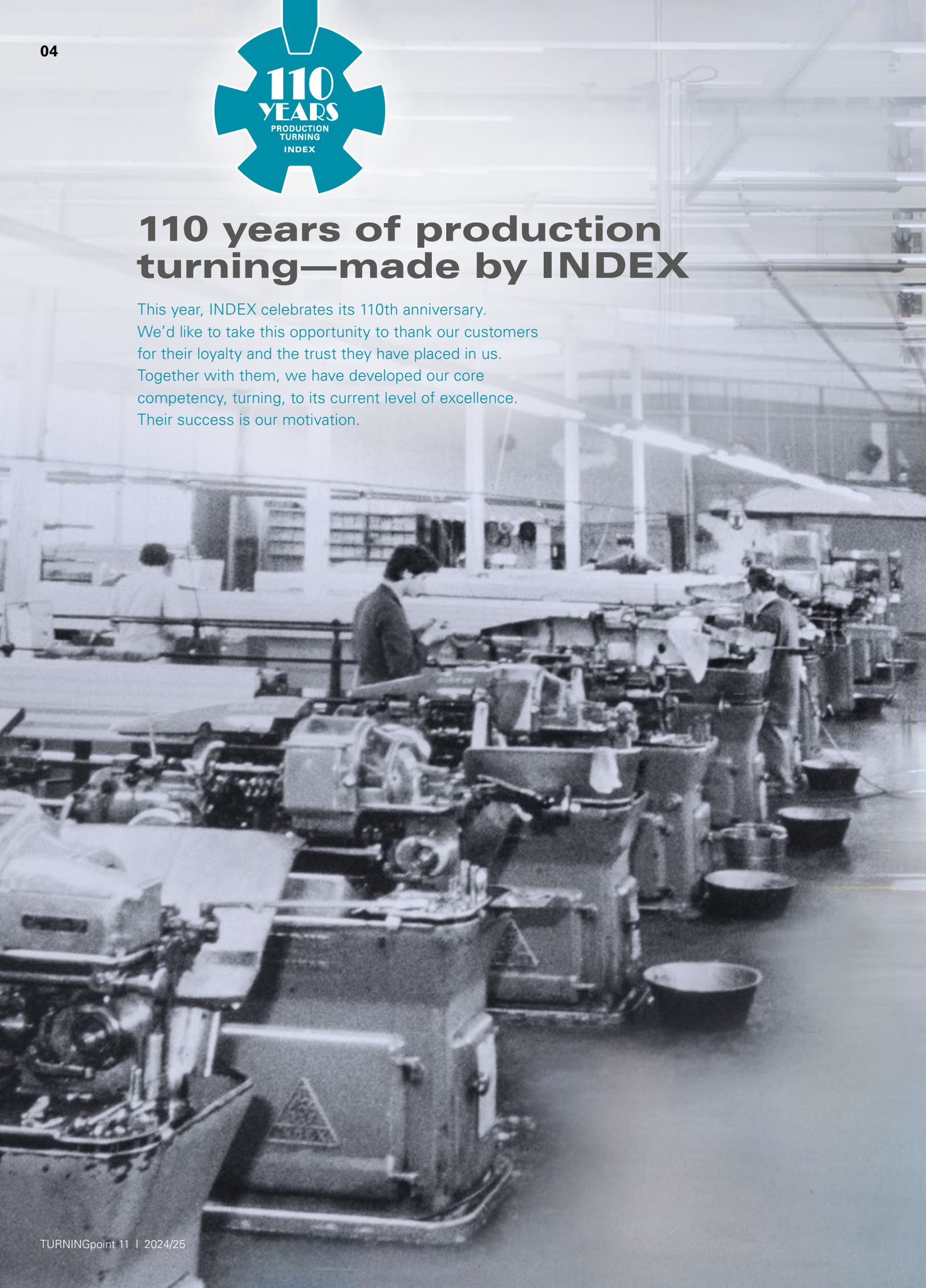
We are delighted to welcome Mr. Roberto Deger as the new Managing Director—Finance of the INDEX Group.

Mr. Deger joined our executive team on July 1, 2024, and is responsible for the areas of finance, human resources, and IT. The 47-year-old finance specialist brings a wealth of operational and strategic experience to his new role, having previously worked for, among others, an international industrial metrology company.

We wish Mr. Deger much success in his new position.

110 years of production turning—made by INDEX

This year, INDEX celebrates its 110th anniversary. We'd like to take this opportunity to thank our customers for their loyalty and the trust they have placed in us. Together with them, we have developed our core competency, turning, to its current level of excellence. Their success is our motivation.

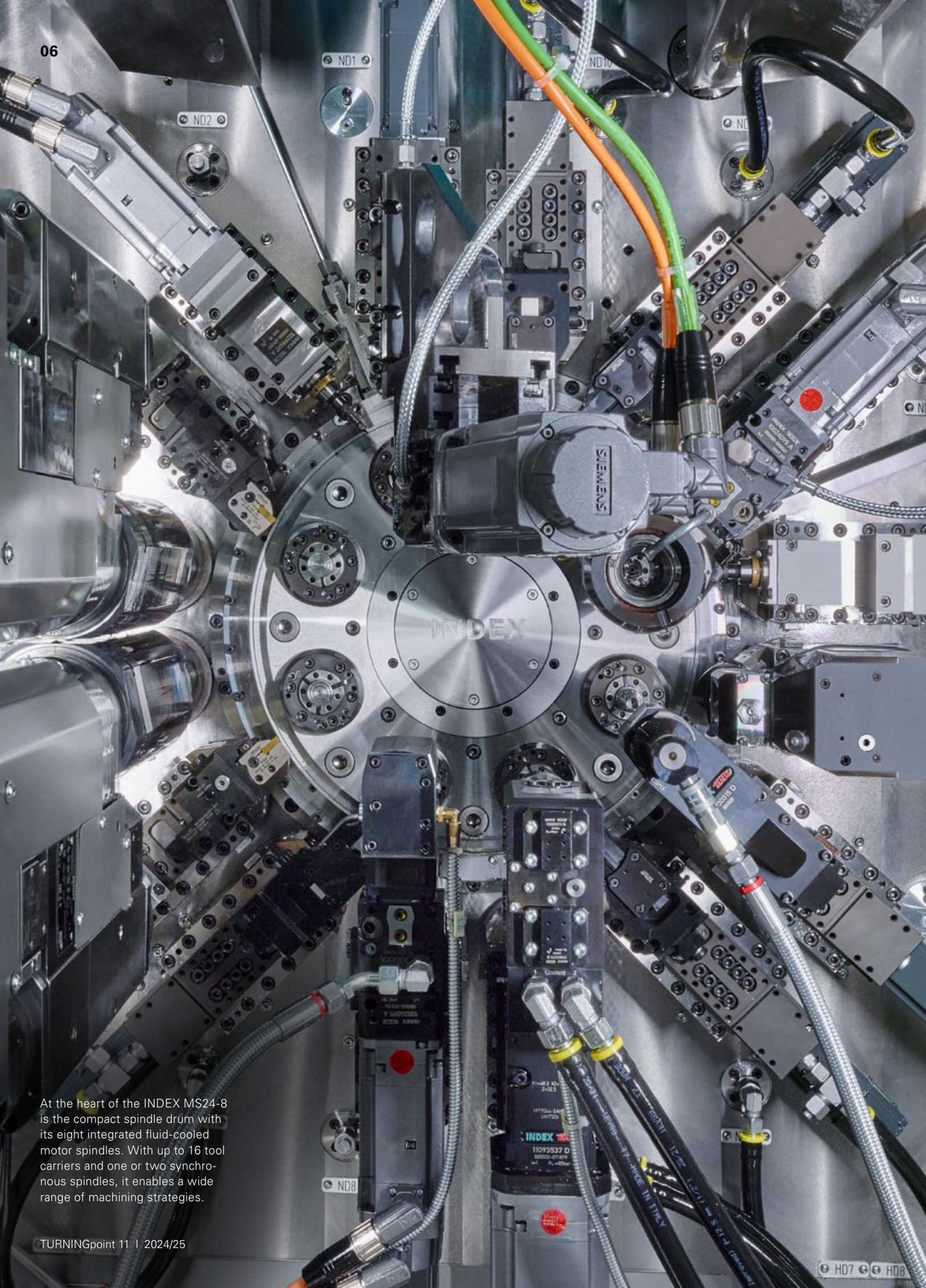


INDEX-Werke was founded in 1914 by Hermann Hahn, who began production of automatic turret lathes that year. As a true Swabian entrepreneur, his creative ideas and commitment to quality laid the foundation for an impressive evolution. To this day, the field of automatic lathes has been continuously developed and optimized with complex manufacturing solutions to meet all the demands of modern machining technology.

INDEX offers a wide range of machines for machining processes, including universal lathes, production turning machines, Swiss/fixed headstock lathes, and multifunctional production centers, which can be equipped with various process technologies and automation solutions. Representing diverse industries, our customers benefit from our innovative solutions, achieving cost-effective manufacturing of their complex workpieces—from small to medium batch sizes to mass production.

Many of our customers have been with us on this long journey. Today, our INDEX and TRAUB production solutions can be found in numerous manufacturing facilities worldwide. At this point, we would like to extend our special thanks to **Müller Präzision GmbH** in Cham/Germany for their longstanding partnership and for providing the accompanying imagery.

› **www.index-group.com/productionturning**



At the heart of the INDEX MS24-8 is the compact spindle drum with its eight integrated fluid-cooled motor spindles. With up to 16 tool carriers and one or two synchronous spindles, it enables a wide range of machining strategies.

The next evolutionary step: with the productivity of eight spindles

Right on time for AMB 2024, we present the new eight-spindle automatic lathe, the INDEX MS24-8. As the successor to the successful MS22-8, this eight-spindle machine incorporates the proven innovations of the INDEX MS24-6, along with an energy-efficient cooling lubricant system and several detailed improvements.

The new INDEX MS24-8 multi-spindle automatic lathe is a logical progression, extending the strengths of the MS24-6 to an eight-spindle version. Building on the MS22-8, it now features 24 mm spindle clearance on eight main spindles, up to two hydraulically locked, extremely fast swiveling synchronous spindles, and up to 16 tool carriers. The INDEX MS24-8 can be used as a classic eight-spindle machine, a double four-spindle machine, or in a mode for double rear-end machining, allowing the production of workpieces of varying complexity.

A new feature compared to the reliable INDEX MS22-8 is the INDEX W-serration on the tool carriers. This patented system enables the operator to simply attach the tool holder, which has been preconfigured in X and Y, significantly speeding up the micrometer-precise alignment. Additionally, the machine utilizes an energy-efficient, frequency-controlled hydraulic pump. This reduces power consumption, noise levels, and ensures a more consistent pressure level. The spindles feature an improved connection geometry for clamping devices, making the Hainbuch TOPlus-Axfix clamping system standard on the main spindle.

There have also been significant advancements in the peripherals. For the first time, the MS24-8 now features an energy-efficient cooling lubricant system. With an optimized pump design in the low-pressure range and frequency-controlled high-pressure pumps, significantly less energy is used while maintaining the same pressure and flow conditions. Users benefit doubly, as the reduced heat introduced into the system does not require extensive cooling, marking another step towards climate neutrality.

What sets the INDEX MS24-8 apart

- Flexible modular design
- Eight individually controllable motor spindles in a compact, fluid-cooled spindle drum with Hirth coupling
- INDEX W-serration for reduction in setup time
- Energy savings thanks to frequency-controlled system hydraulics
- First multi-spindle automatic lathe with an energy-efficient cooling lubricant system
- Can be used as an eight-spindle machine, as double four-spindle machine, or in a mode for double rear-end machining
- Suitable as a bar machine or with robot loading
- Automation solutions for workpiece feeding and removal

Find out more:
› **www.index-group.com/ms24-8**

This machine builds on proven INDEX features. With live tools and C and Y axes, this machine can perform not only standard machining processes but also polylobe turning, polygon turning, power skiving, Torx milling, contour milling, angled drilling, and high-speed whirling.

Benjamin Klotz heads the Development & Design team for multi-spindle automatic lathes at INDEX

CGR Cristin positions itself as a competence partner for the aerospace industry. Components and assemblies must meet the highest technical and quality standards. (Photo: CGR Cristin)

Precise. Fast. Complete.

CGR Cristin, a manufacturer of precision parts for the aerospace industry, primarily specializes in electrical discharge metalworking. In recent years, the company has also increasingly focused on traditional machining. CGR Cristin has been particularly successful with the INDEX C200 automatic production lathe, which has ensured fully automated, process-secure, and highly precise turning for over a year, eliminating the need for subsequent grinding operations.

CGR Cristin is located in Grisolles, southern France, near Toulouse, the heart of the French aerospace industry. Therefore, it's no wonder that this supplier company is part of the aerospace division of the CGR International Group. As a competence center for precision machining, CGR Cristin supports its customers with complex parts and assemblies, from development through prototyping to production maturity.

In addition to sinker and wire EDM, CGR Cristin is increasingly focusing on high-precision turning operations. Managing Director Gilles Golse is particularly pleased with the investment in the INDEX C200 automatic production lathe. "There was no alternative to choosing this INDEX lathe," says Golse. "The INDEX C200 was the only machine technically capable of producing certain part families for large aerospace programs without subsequent transfer to a grinding machine. This means that the INDEX C200 automatic production lathe is so precise that we do not need additional grinding operations for these demanding stainless steel parts, which was previously unavoidable."

The INDEX C200 acquired by CGR Cristin offers ideal conditions for bar machining, with 65 mm spindle clearance and a 160 mm chuck diameter, as well as for medium-sized blanks. With its three turrets, it is designed for the productive machining of complex workpieces. High acceleration of 1 g and rapid traverse rates of up to 60 m/min also contribute to this. Gilles Golse: "This results in significant time savings compared to the previous machine. Additionally, we benefit from the precision and repeatability of the INDEX C200, and the integrated WHU workpiece handling unit allows for autonomous operation."

Cycle time reduced by 38 percent

Gilles Golse cites a family of recurring parts as a typical example: "Previously, production took ›

In front of the INDEX C200 automatic production lathe with WHU workpiece handling unit: Gilles Golse (right), Managing Director of CGR Cristin, and Bruce Joulia (left), Sales Manager for the Southwest sector at INDEX France

With automation, we've managed to machine workpieces for up to seven hours without operator intervention

Gilles Golse is Managing Director of CGR Cristin

18 minutes; today, it takes only 11." He explains: "On our previous lathe, we had to adjust the settings for each workpiece to ensure the required dimensions. That's now a thing of the past. With the INDEX C200, we achieve repeatability of 15 to 20 µm on bar material or inserted blanks, which range in diameter from 20 to 100 mm. We verify the quality at the end of the cycle using a measuring probe directly in the machine, which leads to significant time savings."

An investment that pays off

Initially, Gilles Golse found the decision to purchase the INDEX C200 challenging. "The costs are very high for a company of our size, with around 40 employees. But the savings achieved justify the investment. Moreover, with the INDEX C200, we can also expand into new markets with more complex workpieces." After extensive preliminary discussions with INDEX France's turning specialists and a reference visit to another customer to gather insights, Golse was convinced.

Bruce Joulia, the Sales Manager responsible for INDEX France in southwestern France, recalls the requirements CGR Cristin set: precision, consistent accuracy, and autonomous operation. The automation aspect was particularly crucial due to the shortage of skilled workers, especially for a company operating in two shifts. CGR Cristin's machining team therefore decided to equip the INDEX C200 with a WHU gantry. This integrated workpiece handling unit can be used for both loading and unloading as well as for the removal of remnants and is designed for parts weighing up to 25 kg and with a diameter of up to 120 mm.

Gilles Golse is impressed: "With automation, we've managed to machine workpieces for up to seven hours without operator intervention. For orders with longer cycle times, we start production on Friday and retrieve the finished parts on Monday." To further increase the machine's autonomy, CGR planners, together with INDEX technicians, made additional adjustments, such as increasing the number of available pallets and bars.

Intense training phase

To quickly familiarize themselves with the new lathe, CGR Cristin paid particular attention to ›

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employee training at the beginning. This took place several times on-site, as well as at INDEX France's facilities. Gilles Golse himself even participated, actively contributing to the development and implementation processes. As he says, "The INDEX France team has always supported us, whether with trainers, setup technicians, or via the hotline. We also take advantage of the convenience and speed of ordering consumables and spare parts from the iXshop." Currently, he is considering a maintenance contract to secure manufacturing processes in the long term.

Gilles Golse also emphasizes another important point: he and his company are committed to operating the INDEX C200 with high energy efficiency. This is achieved through the INDEX ECOfluid pump control, which significantly reduces the energy consumption of cooling lubricant systems. The pump speed is continuously and automatically adjusted to deliver only the amount of cooling lubricant that is actually needed. This results in a substantial reduction in energy requirements and significant cost savings.

Bearings, end pieces, connectors: fully machined workpieces for the aerospace industry

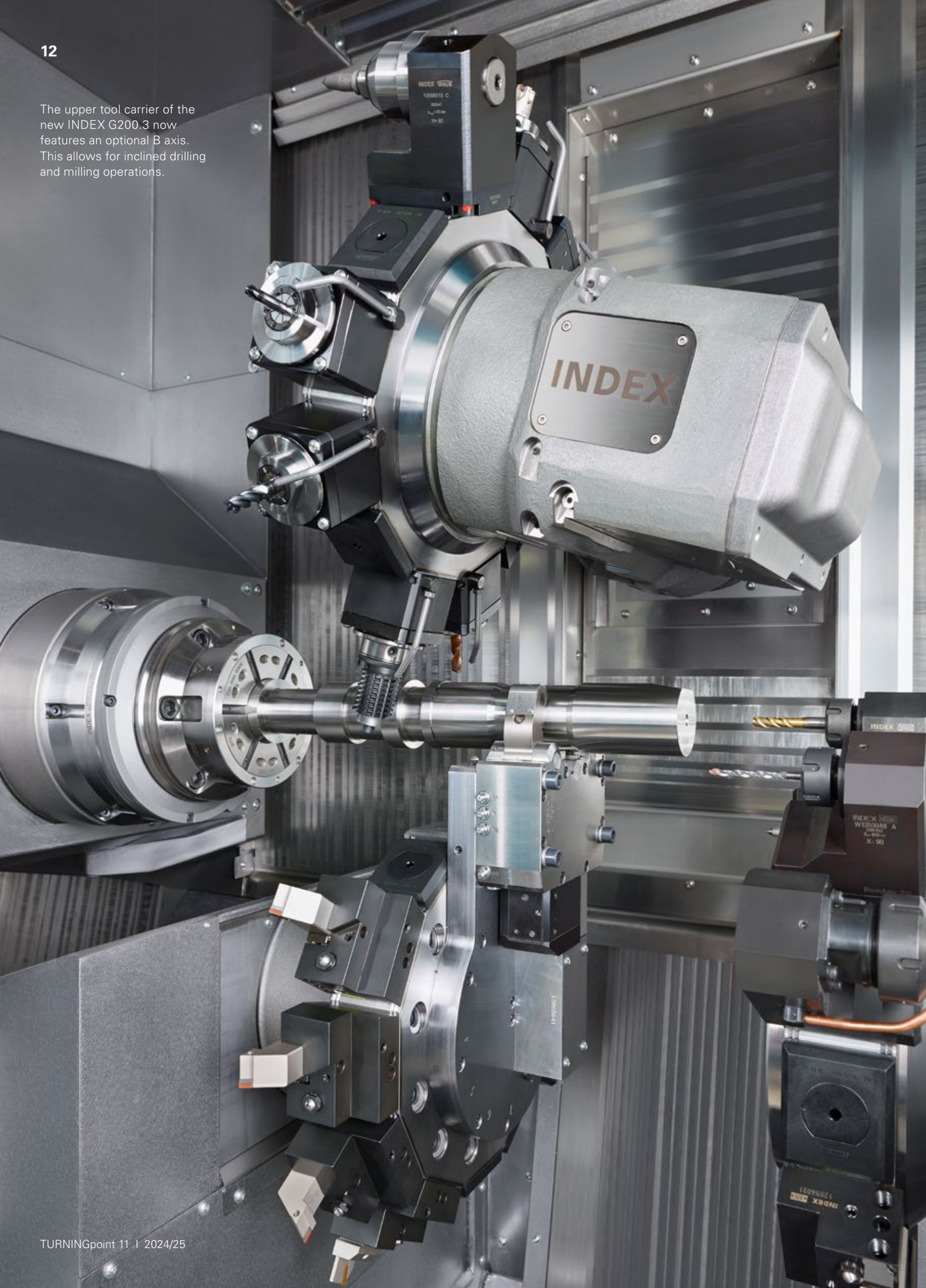
To prevent heat generated by the pumps and cooling units from affecting the air-conditioned workshop, CGR Cristin installed the ECOfluid unit in an adjacent room. This not only ensures a consistent temperature in the workshop but also reduces noise levels in the production area.

Precision parts for the aerospace industry

CGR Cristin is a wholly-owned subsidiary of the CGR International Group, which employs 1,500 people at 23 production sites worldwide and generated revenue of 220 million euros in 2023. Seventy percent of CGR's customers are in the automotive industry and ten percent are in the aerospace industry.

Founded in 1983 and part of the CGR Group since 2017, CGR Cristin employs about 40 people. Located in Grisolles, near Toulouse, the company manufactures precision parts in small and medium batches for the aerospace industry.

CGR Cristin, 120 Chemin du Sautou, 82170 Grisolles, France
› **www.cgr-international.com**



The upper tool carrier of the new INDEX G200.3 now features an optional B axis. This allows for inclined drilling and milling operations.

Keeping an ear to the market—innovations in turning and milling

With the expansion of the G-series through the new INDEX G320 compact turn-mill center and the additional B axis in the INDEX G200.3 turret version, we will be able to meet customer needs more effectively in both economic and technological aspects.

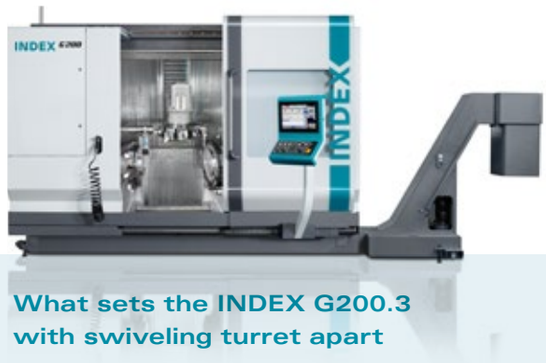
"Turn-mill machines have been a core competency of ours for years," says Ralf Stark, Project Manager for new turning and milling machine developments at INDEX. "They became real game-changers in 2018 when we launched the first completely redesigned G-series turn-mill centers. Since then, sales have continuously increased, making this product group a significant part of our machine sales."

The success of the turn-mill centers in the G-series, the R-series, and the TRAUB TNX machines is due to their ability—equipped with a milling spindle—to perform complete machining of complex parts. They are perfect for integrating additional technologies such as gear cutting, grinding, or measuring. "At INDEX, we have significant expertise in this area, which we make available to our customers through specialized cycles," says Ralf Stark. "These cycles run in the background, freeing users from extensive programming work."

The strong growth in the turn-mill center segment is primarily driven by the INDEX G-series, which includes models ranging from the INDEX G200.3 and INDEX G220 with 76 mm spindle clearance and 260 mm chuck diameter to the INDEX G500 and G520 with 120 mm spindle clearance and 500 mm chuck diameter. "These machines are based on a completely new design concept, with all components, including guides, covers, tool changers, and turrets, being newly developed," explains Ralf Stark. ›

For medium-sized parts requiring a moderate amount of inclined drilling and milling operations, our new INDEX G200.3 with its swiveling turret is the ideal solution. The idle times it achieves are unbeatable.

Ralf Stark is the Project Manager for new developments in turning and milling machines at INDEX



What sets the INDEX G200.3 with swiveling turret apart

- Efficient work area concept for turning lengths of up to 1200 mm
- Compact footprint
- Identical main and counter spindles Ø 76 and 90 mm
- Max. chuck diameter 260 mm
- Powerful upper tool turret with integrated motor
- Y/B axis for inclined machining operations
- Two lower tool carriers, each with 12 stations VDI30 or 15 stations VDI25
- High thermal and mechanical stability
- Wide range of automation options

Find out more:
› **www.index-group.com/g200.3**

INDEX G200.3— now with a swiveling turret

The INDEX G200.3 was previously equipped with an upper turret that could move in the linear X, Y, and Z axes. To enable inclined drilling and milling operations, it now features a B axis. This means the turret now has a dual-supported Y/B axis of the latest generation, mounted on the Z axis slide positioned above the axis of rotation.

Ralf Stark explains: "This setup appeals to customers who need to perform a moderate number of inclined drilling or milling operations in addition to turning for the complete machining of medium-sized parts. For these users, a milling spindle is often too much. Additionally, their tool change times are longer than the turret's indexing time. In these cases, the new INDEX G200.3 impresses with shorter cycle times."

INDEX G320 compact— reduced costs and space requirements

The latest developments in the INDEX G-series turn-mill centers include the new INDEX G320 compact introduced at AMB 2024. Compared to the regular G320, INDEX has managed to increase the power density. The G320 compact is based on the machine bed of a G220, requiring less floor space. With its main spindle featuring 102 mm clearance, it closely matches the performance of the INDEX G320.

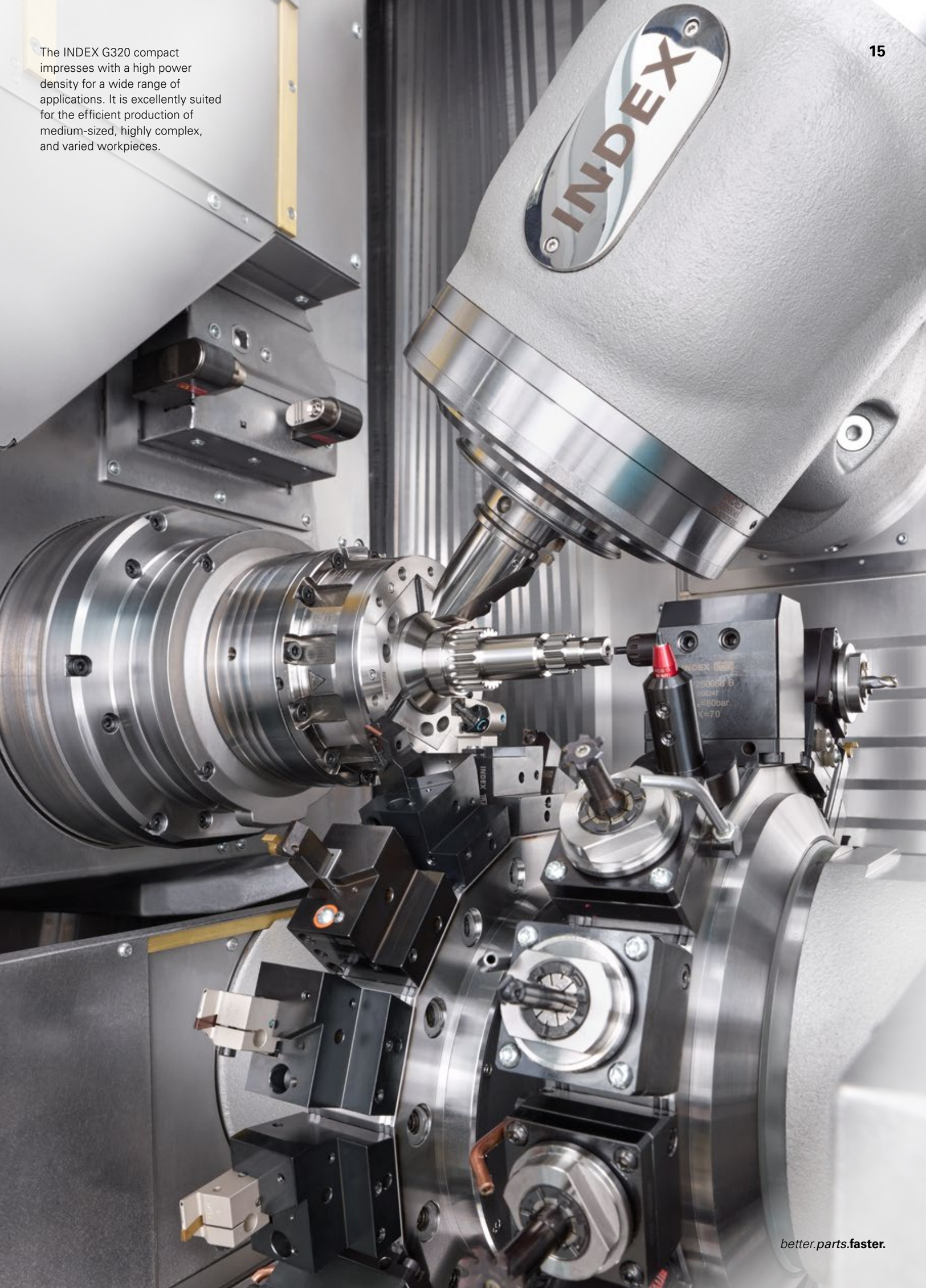
For the counter spindle, customers can choose between spindle clearance of 76 mm and 90 mm. The milling spindle accommodates HSK63 tools. The lower turrets each offer twelve positions with a VDI30 interface. Ralf Stark summarizes the advantages: "Customers get nearly the full functionality of an INDEX G320 with a smaller footprint. With fewer moving masses, it is also more dynamic, more energy-efficient, and more cost-effective."

Key features of the INDEX G320 compact

- Clever work area concept for turning lengths of up to 1200 mm
- Main spindle Ø 102 mm / chuck max. Ø 260 mm
- Counter spindle Ø 76 or 90 mm
- Powerful motor milling spindle (HSK63) with Y/B quill kinematics
- Two lower tool carriers, each with 12 stations VDI30
- High thermal and mechanical stability
- Second setup station for the tool magazine
- Wide range of automation options

Find out more:
› **www.index-group.com/g320compact**

The INDEX G320 compact impresses with a high power density for a wide range of applications. It is excellently suited for the efficient production of medium-sized, highly complex, and varied workpieces.




INDEX G420
INDEX

Increased production capacity through complete machining and automation

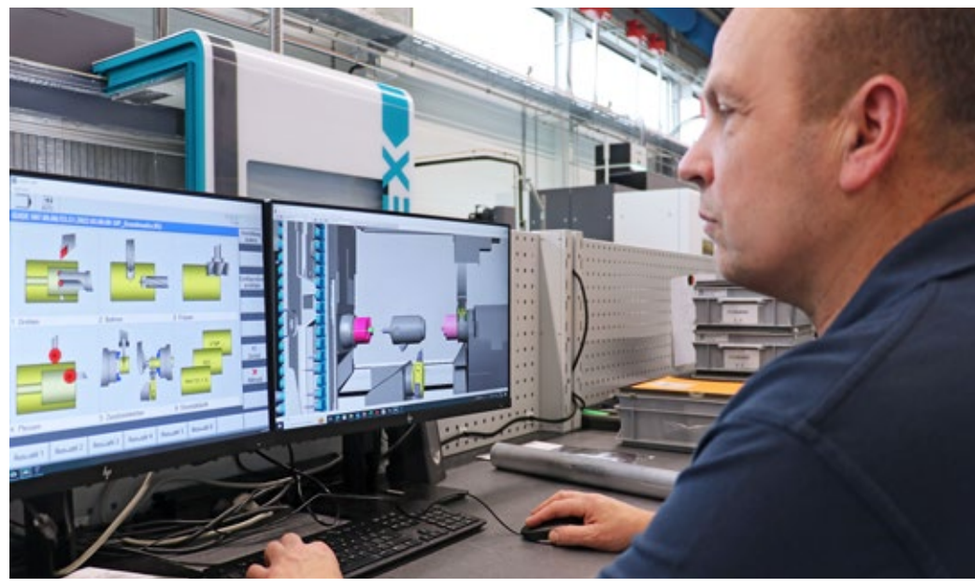
NTS Hengelo is a Dutch precision parts manufacturer producing highly accurate machine components for the semiconductor industry. Pre-production, which must meet accuracies and tolerances up to 0.02 mm, has long been a bottleneck in manufacturing. With the automated INDEX G220 and G420 turn-mill centers, cycle times have been drastically reduced, significantly increasing production capacity.

The semiconductor market is rapidly evolving. Modern microchips often house more than 50 billion transistors. To create these microscopic structures, room-sized lithography machines are used. The world leader in these machines is headquartered in the Netherlands, with a global network of partners, suppliers, and research facilities, including NTS Hengelo and NTS Drachten. As a first-tier supplier, NTS specializes in high-precision machining, heat treatment, mechatronics, and cleanroom assembly of machine components with accuracies up to 1 µm.

While NTS Drachten focuses on smaller parts, NTS Hengelo produces larger components—including assembly, qualification, and testing in a cleanroom. Machining these demanding parts is often a multi-stage process, with over 70 modern, high-quality CNC machine tools available in Hengelo. These include machining centers, turn-mill centers, grinding machines, and fully hydrostatic precision hard turning machines.

Complete machining on turn-mill centers accelerates pre-production

Key partners for NTS Hengelo's manufacturing are INDEX and its long-time Dutch representative, Laagland BV. Eddo Cammeraat, Managing Director of the company, knows that NTS in Hengelo and Drachten, as precision manufacturers, place great value on high-quality equipment. "That's why we recommended the use of INDEX turn-mill centers for specific parts," he says. "With turning and milling operations ›



Left: Installed in just one week at NTS Hengelo: The iXcenter robot cell ensures low-manpower night and weekend shifts on the INDEX G420.

Right: Process Engineer Richard Veldhof uses the INDEX Virtual Machine and VPro software solutions for programming and for optimizing cycle times and ensuring process reliability in machining.

Typical components machined at NTS Hengelo on INDEX turn-mill centers
(Photo: NTS Hengelo)

We achieve huge time savings of around two-thirds. This is mainly because we can work with the milling spindle and turret on both the main and counter spindles simultaneously.

Peter Franken is a Production Engineer at NTS Hengelo

on a single machine, where up to three tools can be used simultaneously, setup and machining times are significantly reduced."

In 2020, NTS invested in the INDEX G220 turn-mill center. Eddo Cammeraat recalls: "We discussed cycle times for stainless steel machining. Initially, there was skepticism in Hengelo about whether the times calculated by INDEX could be achieved. The results convinced Production Engineer Peter Franken and his colleagues. "We achieved huge time savings of around two-thirds. This is mainly because we can work with the milling spindle and turret on both the main and counter spindles simultaneously."

Extremely flexible with maximum productivity

The decision to invest in two more INDEX G420 turn-mill centers was driven by their powerful main and counter spindles, motor milling spindle, and two turrets for optimal hybrid machining. The INDEX G420 offers excellent stability and damping properties, minimizing vibrations. "This allows us to use higher cutting values and further reduce machining times. Knowing from the INDEX G220 that we could rely on INDEX's cycle time calculations, we immediately purchased the INDEX G420," notes Peter Franken.

"Automation is critical in our pre-production," says Process Engineer Richard Veldhof. "Even with batch sizes between 1 and 20 pieces and cycle times that can last several hours, we aim for automated, low-manpower night and weekend shifts."

Consequently, NTS Hengelo ordered a second INDEX G420 with iXcenter. Regional Sales Manager Marc Müller: "Since we provide the machine and automation cell with the robot from a single source, fine-tuned to each other, the iXcenter's commissioning takes only about a week." This was advantageous for NTS Hengelo as normal production had to continue alongside installation.

"We have become faster, with higher process reliability"

Franken, Veldhof, and their colleagues in pre-production are very satisfied with the INDEX turn-mill centers, especially the new G420: "Considering we exclusively machine difficult-to-cut materials like Invar or titanium and often have to maintain tolerance class IT6, the machines perform exceptionally well. We achieve the required quality much more easily and quickly than before and benefit from more stable processes," confirms Peter Franken. ❯

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Nevertheless, working with the INDEX turn-mill centers represented a major shift: "Previously, we machined the part on the main spindle first and then finished it on the counter spindle. Now we sometimes machine with three tools simultaneously. Thanks to the training and INDEX Virtual Machine and VPro software solutions, we quickly mastered this challenge."

INDEX software simplifies programming and setup

Richard Veldhof explains: "To optimally program a turn-mill center with three tool carriers, we use the INDEX VPro programming support, which enables image and dialog-supported programming without extensive prior knowledge. "We can program all channels separately in VPro, assemble them, and later easily optimize them."

VPro is an INDEX programming method that consistently guides the operator through the machining process. It encompasses all machining technologies such as turning, drilling, milling, and even machine and workpiece automation. Complex part geometries that require five-axis simultaneous machining are still programmed by the NTS team using CAD/CAM systems. VPro can read these elements through an interface, convert them into NC codes in a post-processor run, and integrate them into the NC program created with VPro. "This works excellently," confirms Peter Franken. "We then run the complete program on the Virtual Machine, which mirrors the real machine's interface 1:1 on the PC. In this software, we simulate the programmed machining, can detect any interference contours, and perform collision analysis."

NTS has not yet needed any major service interventions, which speaks to the quality of the machines, but also to the maintenance and care, with both Laagland and INDEX always providing support.

Celebrating the successful partnership: (from left) Eddo Cammeraat from Laagland, Richard Veldhof and Peter Franken from NTS Hengelo, and Marc Müller from INDEX.

Specialist in high precision

NTS Hengelo is part of the global NTS Group, which develops, produces, assembles, and tests complex (opto-)mechatronic systems and mechanical modules for major high-tech machinery manufacturers. In 2022, NTS generated revenue of over 400 million euros with 1,800 employees. NTS Hengelo and Drachten (Netherlands) specialize in high-precision parts manufacturing and complex mechatronic assemblies. Their customers primarily come from the semiconductor and analysis industries.

NTS Hengelo, Granaatstraat 21, 7554 TR Hengelo, Netherlands
› **www.nts-group.com**

Uncompromising automation

Manufacturing operations in high-wage countries typically focus on complex parts that require extensive know-how and utmost precision in machining. Ideally, these parts come fully machined from the machine—automated, of course. At the INDEX Open House 2024, we showcased how such a manufacturing solution can look in practice.

The basis: From our current INDEX G-series, which consists of top-class turn-mill centers, we selected the G320. It offers powerful drives on the main and counter spindles, a motor milling spindle with Y/B axis, and two lower tool turrets. With excellent stability and damping properties, it is predestined for demanding machining tasks in the medium-size range.

The automation: With the iXcenter, the INDEX G320 turn-mill center transforms into a fully automated production cell, as the iXcenter includes a robot that is responsible for all parts handling. But that's not all: It also features a measuring unit integrated with corresponding software and the INDEX Closed Loop interface, enabling fully automated process control and consistently high precision.

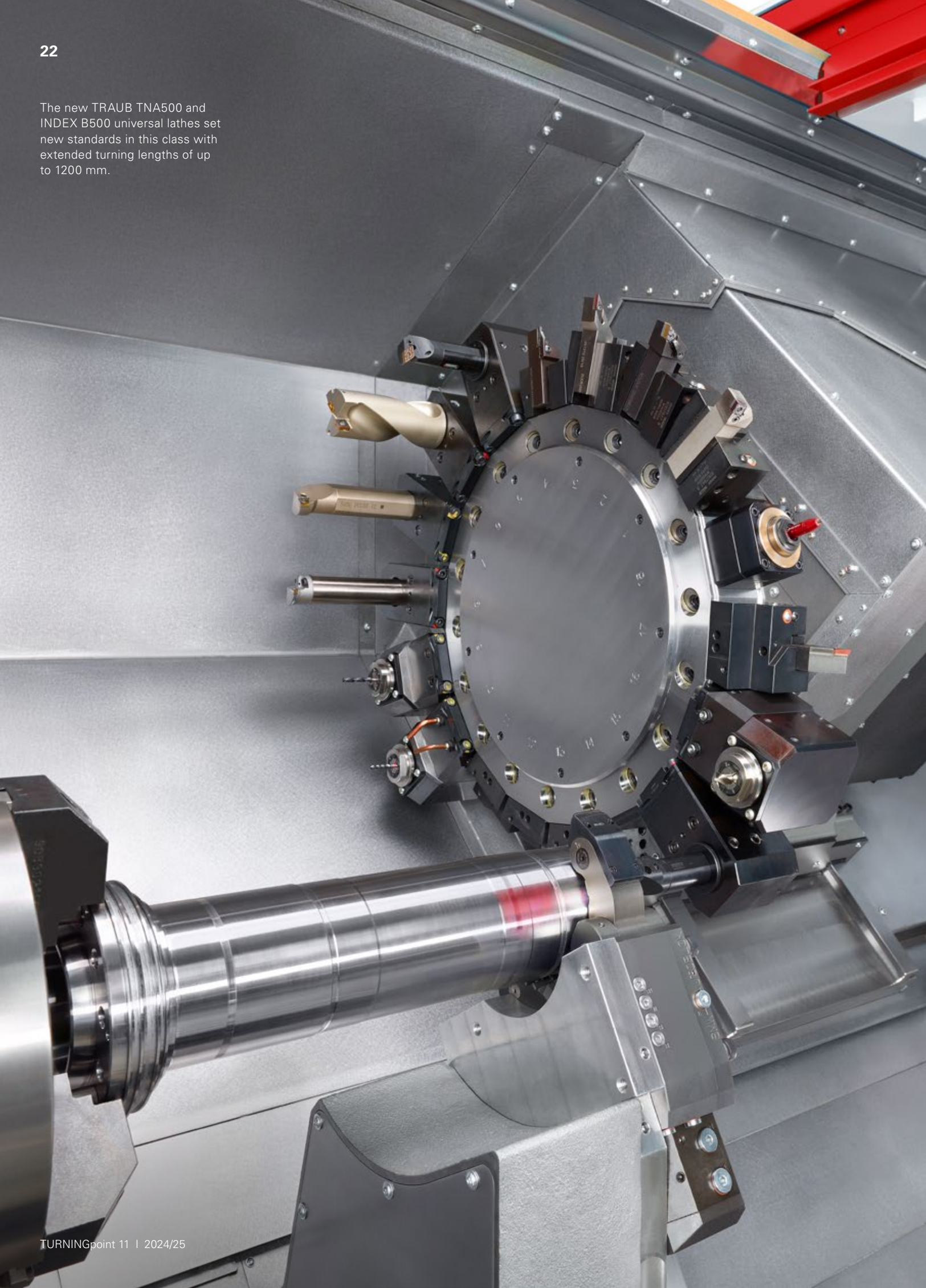
The addition: To ensure that enough tools are always available for automated operation, we have docked our iXtools tool magazine to the machine. It complements the machine-integrated tool magazine with its 110 holders, adding up to 230 more tools (in the case of the INDEX G320).

INDEX turn-mill centers with integrated automation

- INDEX G320, powerful turning and milling
- iXtools tool magazine for additional tool supply
- iXcenter with robot for parts handling
- Measuring unit with INDEX Closed Loop interface
- Highest quality through automated process control
- Ideal for small and medium batch sizes
- Minimal setup effort and personnel requirements
- The complete system from INDEX

Find out more:
› **www.index-group.com/automation**

The new TRAUB TNA500 and INDEX B500 universal lathes set new standards in this class with extended turning lengths of up to 1200 mm.



New products and innovations for 2024

The universals in long versions

The new TRAUB TNA500 and INDEX B500 universal lathes set new standards in this class with extended turning lengths of up to 1200 mm. This extension option allows for the precise and fast machining of even longer workpieces, meeting the requirements of various industries. With nearly identical machine construction, the two machines differ only in their control systems.

› **www.index-group.com/tna500**
› **www.index-group.com/b500**

Dental abutments— 70% faster manufacturing

Our technology specialists have revolutionized the production of abutments. Compared to manufacturing on Swiss automatic lathes, workpieces can now be processed 70% faster on INDEX multi-spindle automatic lathes. In addition to straight and angled abutments, dental implants can also be produced on INDEX multi-spindle automatic lathes.

› **www.index-group.com/medical-solutions**

New iXpanel display for Siemens controls

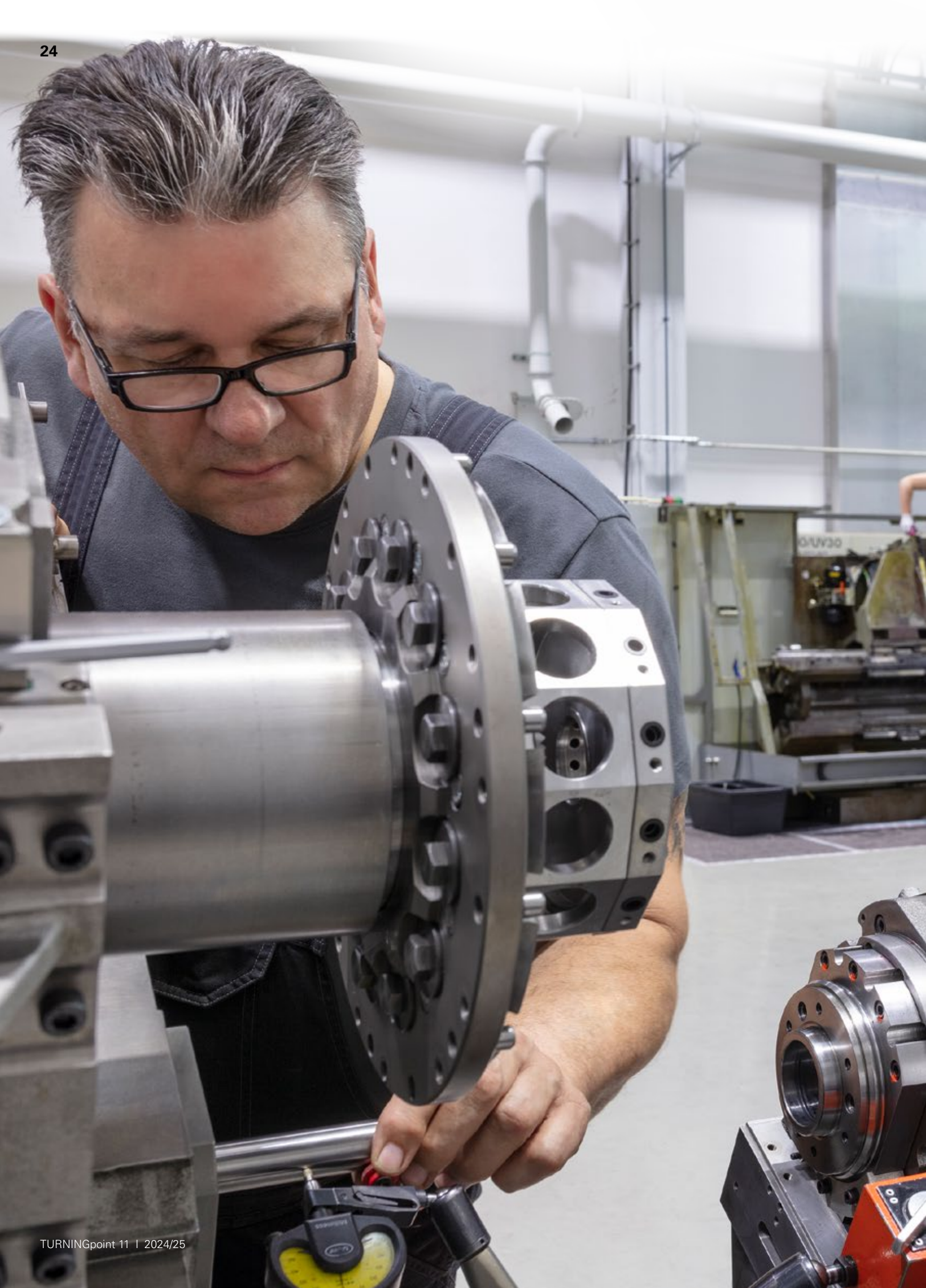
Our new iXpanel display for Siemens controls is now even more intuitive, larger, and more functional. In addition to hardware improvements like Full HD resolution and a larger screen, new functions for technology applications (e.g., CenterMaster, ChipMaster, etc.) have been implemented. Operation will be even easier in the future thanks to an appealing IT design.

› **www.index-group.com/ixpanel**

SIEMENS Finance and Deutsche Leasing as strong financing partners

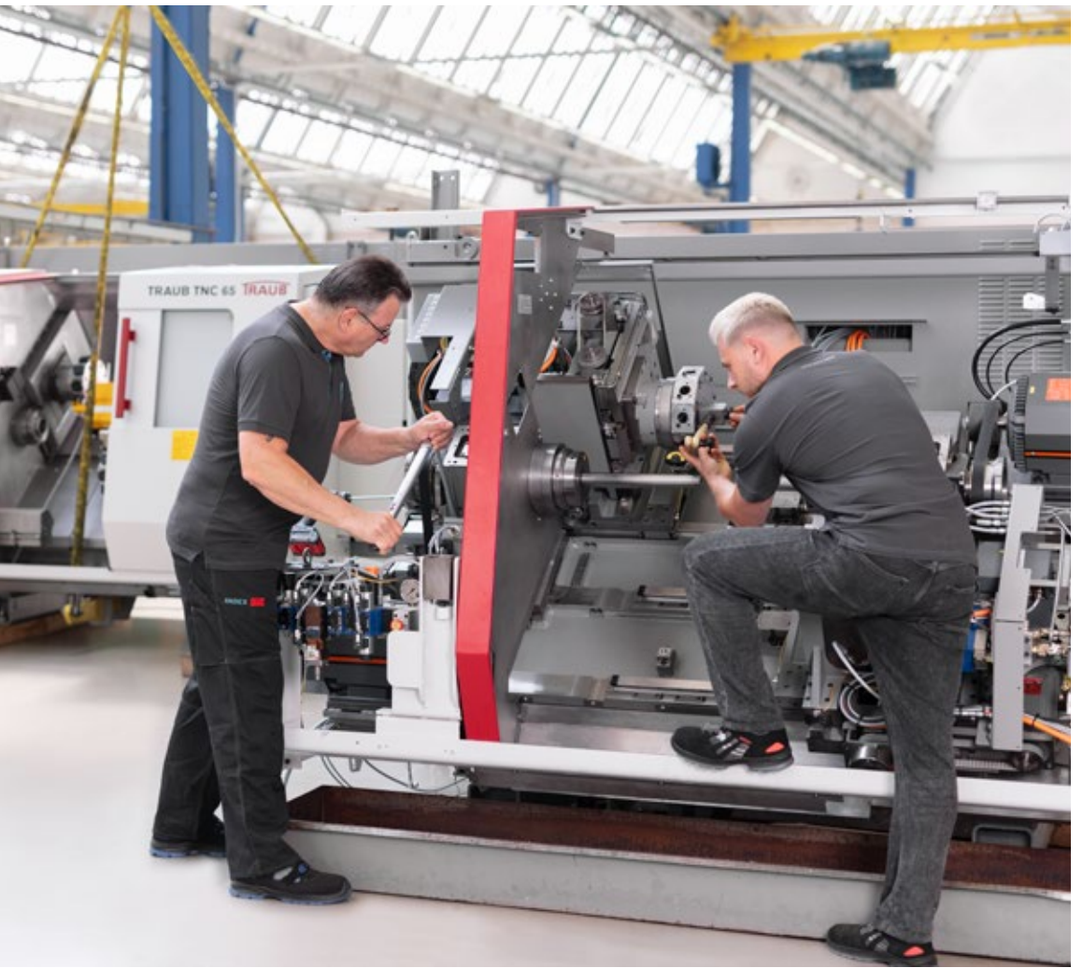
Customers interested in the turning and milling solutions from the INDEX Group can now benefit from attractive financing offers tailored to their needs from our partners Siemens Financial Services and Deutsche Leasing. We help you optimally prepare for the future. Get in touch.

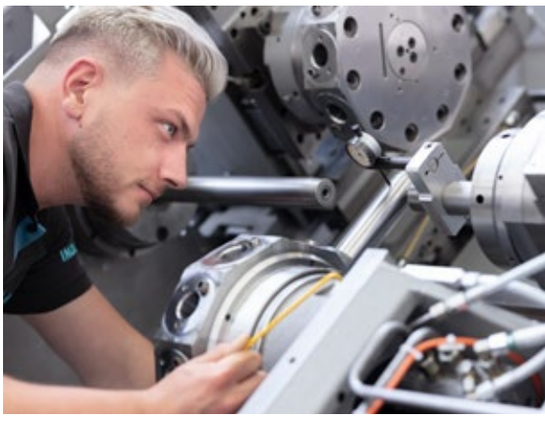
› **www.index-group.com/finance**



Giving our machines a second life

INDEX and TRAUB machines have always been synonymous with the highest quality, as is reflected by their sustained precision machining over extended periods—up to twenty-five years of operation is not uncommon. And even then, it's not the end! With our refit program, we restore these machines to their original delivery condition, ready for a second, equally precise and powerful service life.





Photos above:
All wear parts such as linear guides, covers, cables, and hydraulic lines are replaced, spindles are re-bedded, bearing seats reworked, and turret disks changed. Each refit machine undergoes a detailed inspection, including a geometry check, before delivery.

INDEX Refit—machine overhaul to manufacturer quality

Is it really worth it to refit a machine tool? "For INDEX and TRAUB machines, my answer is: yes!" says Tobias Babel, Head of Tooling & Refit at INDEX. He's convinced because "our machines have a high-quality basic structure worth preserving." Customers receive a completely overhauled machine with new control technology that meets or even exceeds the original performance level.

The decision to refit involves many considerations. Customers evaluate the machine type and whether similar new machines are available on the market. An important criterion is whether the technology at the original time of delivery is still sufficient or if newer technical options are needed. Cost is also a crucial factor, alongside the alternative of re-establishing and validating established processes on a new machine.

(Almost) like new—only cheaper!

For customers not requiring a technical upgrade in the form of a new machine, a refit often makes sense. They benefit from refit costs being about sixty percent of a comparable new machine, yet still achieve high process reliability. All travel movements and spindle runs are restored to be play-free. The smoother operation improves workpiece quality and extends tool life, leading to a quick return on the refit investment. Moreover, there's no need for employee retraining. Existing programs, tools, and fixtures can continue to be used.

Since 2017, INDEX has offered comprehensive refit services, divided into two fundamental business models. The first is the classic refit of customer machines, where the machine is picked up, overhauled, and returned. Alternatively, an identical machine can be overhauled ›

and swapped with the customer's machine, minimizing production downtime.

In the second model, INDEX buys back old INDEX and TRAUB machines, refits them at the factory, and resells them. "These refurbished machines are in demand among both new and existing customers," says Tobias Babel. "The customer receives a genuine INDEX machine—as good as new. For many tasks, this is an economical and high-quality alternative to new machines." Babel points out that the service does not compete with the company's own technical innovations. "On the contrary, customers are often so impressed with our refit machines that when they have higher technological requirements, they then invest in a new INDEX machine."

Significant effort, visible success

INDEX refits are labor-intensive and require extensive expertise. The machine is disassembled down to the last screw and thoroughly cleaned. All wear parts such as linear guides, covers, cables, and hydraulic lines are replaced, spindles are re-bedded, bearing seats reworked, ›

We approach our refit work with passion, staying true to INDEX's commitment to the highest standards of quality and precision.

Tobias Babel is head of Tooling & Refit at INDEX

Mr. Babel, what distinguishes the INDEX refit from other machine refurbishment services?

At INDEX, we offer only the 100% refit package—no half measures. INDEX and TRAUB machines refurbished by us must meet the same high standards as new machines. This requires a complete disassembly to the smallest detail, resulting in more assembly effort than for a new machine.

Our customers benefit from the fact that an INDEX machine remains a true INDEX even after the refit—from the original manufacturer with original parts. Every task performed on the machine, every component replaced, is documented, ensuring our service staff know exactly what has been installed and which spare parts to bring if needed.

Do you offer refit services for all INDEX and TRAUB machines?

In principle, yes. Unless the machine is over 30 years old, as even our most experienced staff may lack the necessary know-how, and some electronic components may no longer be available.

Custom-made or rarely built machines can also pose challenges; in some cases the effort required for a refit can be so high that it is no longer economically viable.

Machines sold in large numbers, such as the TRAUB TNL and TNC machines, as well as the INDEX G200.1 or production turning machines in the ABC and C series, are ideal for refit. For Siemens-controlled INDEX machines, we even offer a control upgrade from the 840D Power Line to the 840D Solution Line. The customer receives the latest INDEX interface, including all INDEX cycles on their iXpanel cockpit— that's available only from us!

The oldest machine we've refitted was a TRAUB TNA600. It had already been in production for 30 years. Seeing it brought back memories, as I had worked on it as a young apprentice.

Jürgen Wachsmuth
works in the Tooling & Refit department at INDEX

and turret disks changed. In the area of electronic components, too, INDEX continuously expands its refit capabilities, replacing smaller servo motors and overhauling larger ones. In the control cabinet, numerous cables and electromechanical components are cleaned and replaced. Defective components and wear parts are located and exchanged. E/R modules, power modules, control modules, and PCUs are overhauled.

Tobias Babel's team can test Siemens and TRAUB controls on a test stand, conducting a 24-hour endurance test with various speed profiles. During this process, the controls are checked for errors. After assembly and painting, the machine looks and functions like new, undergoing acceptance testing, including geometry inspection and documentation. The customer receives a one-year warranty and can rely on long-term spare parts availability.

Around 35 employees in Esslingen work on refits, along with 22 more in the assembly plant in Slovakia—an efficient mix of mechanically and electrically trained, highly experienced, and young staff who always work in pairs on a machine. They are responsible for all tasks from unloading the machine upon delivery to redelivery. "We typically plan three months for a refit," says Babel. "Depending on the machine type and effort required, it can take longer, especially with complex R-series machines."

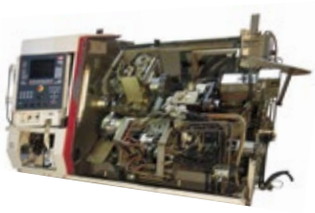
Machines undergoing INDEX refit are usually 10 to 25 years old. Experience is key during disassembly. Jürgen Wachsmuth, with INDEX for 38 years, knows these machines inside out. He recalls, "The oldest machine we've refitted was a TRAUB TNA600. It had already been in production for 30 years. Seeing it brought back memories, as I had worked on it as a young apprentice." Such reunions are indeed a joy.

Highlights INDEX Refit

- 100% refit with manufacturer expertise
- Restoration of the base configuration
- Replacement of all relevant wear parts (original parts)
- Cleaning, testing, and renewal of electronic components
- Control upgrade from Siemens 840D Power Line to Solution Line (INDEX ABC, C100, C200, G200)
- 1 year warranty
- Long-term spare parts service
- Capacity: approximately 50 machines per year

Find out more:
› **www.index-group.com/refit**

INDEX Refit—what our customers say



Schlenker Spannwerkzeuge

One of the first customers to utilize the INDEX Refit service back in 2017 was Schlenker Spannwerkzeuge GmbH & Co. KG in Villingen-Schwenningen/Germany. At that time, a twelve-year-old TRAUB TNC65 underwent a comprehensive refit to maintain the required precision and restore the machine's availability to an optimal level. Managing Director Britta Hoffmann: "Refit is a matter of trust, and I have that trust in INDEX as the manufacturer of our lathes. Our nearly 20-year-old TRAUB TNC65 has been running in three-shift operation since the refit. Its current accuracy is at the same level as when it was initially delivered; and its availability is excellent."

› **www.index-group.com/refit-schlenker**

Photo: Endress+Hauser

Endress+Hauser

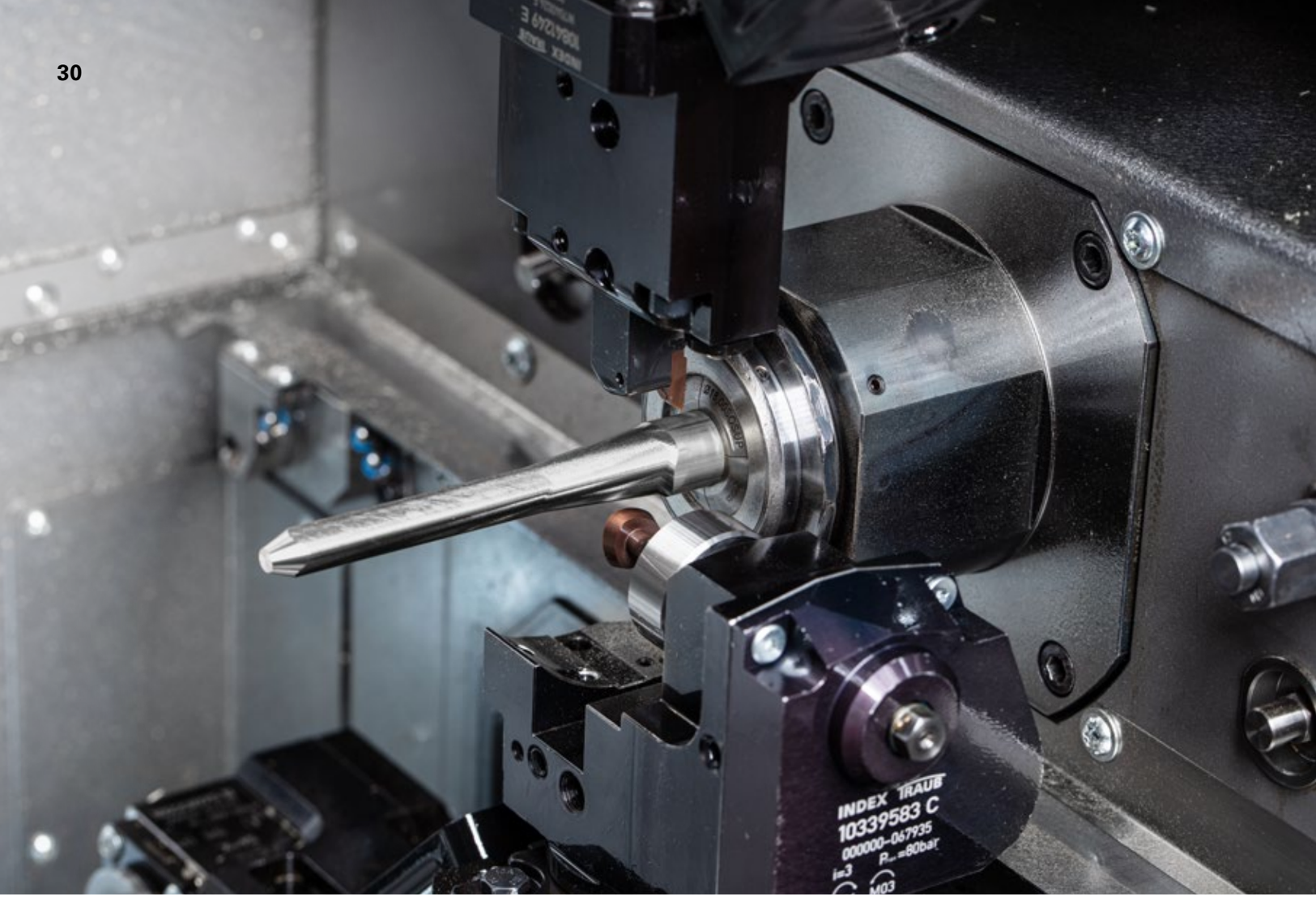
Endress+Hauser manufactures components for level and pressure measurement technology from difficult-to-machine stainless steel alloys at its Maulburg site in Germany. Since 2009, the company has invested in twelve INDEX C200 production turning machines. To meet high quality standards, the company decided to refit the oldest eight C200 machines after ten years of intensive use. Armin Nüssle, Head of Mechanical Manufacturing: "The returned machines are equivalent in quality to new machines. Additionally, tool wear is now reduced, and the machines run much smoother and quieter. During the refit, we also received an additional improvement: the ChipMaster software, which ensures controlled chip breaking. What impresses me most is that each returned machine was able to resume full three-shift operation after just two to three days, as if nothing had happened."

Maximator

Maximator GmbH, a technology leader in high-pressure technology, invested in three INDEX R200 turn-mill centers more than ten years ago. To keep them process-reliable and productive, the company decided in 2023 to refit the three machines with INDEX. Production Manager Peter Hanke: "INDEX took care of the pickup of the first R200 and provided regular status updates throughout the refit process. After about six months, it was returned to us as an almost new machine. Since the user interface remained unchanged, our employees could resume production immediately without any retraining." His conclusion: "We did everything right. We act sustainably, reduce costs compared to new investments, and get our proven machines back—as good as new."

Watch the film now:

› **www.index-group.com/refit-maximator-film**



10-fold increase in productivity with rotational non-round turning

Non-round components often required considerable effort or methods that only allowed limited part geometries, such as polylobe turning of hypotrochoid H profiles according to DIN 3689-1. INDEX's development of rotational non-round turning within the ZykloMed joint research project revolutionizes non-round machining, setting new standards in efficiency and tool life. This innovative process can increase productivity by 10 times and tool life by 13 times. These impressive improvements open up new possibilities and underscore our commitment to technological innovation and the highest customer satisfaction.

Watch the film now:
› **www.index-group.com/tnl20-technology**

Together toward the goal

The machining of non-round parts is often associated with time-consuming processes such as contour milling. Productive non-round machining methods like polylobe turning are limited to specific hypotrochoid shapes. Manufacturing long non-round parts, such as bone nails in medical technology, was thus very time-consuming and costly.

Together with partners Hartmetall-Werkzeugfabrik Paul Horn GmbH, Beutter Präzisions-Komponenten GmbH & Co. KG, and the wbk Institute for Production Technology in Karlsruhe/Germany, INDEX took on this challenge within the BMBF-funded ZykloMed joint research project to develop a new innovative non-round turning process: rotational non-round turning.

The principle of rotational non-round turning, like polylobe turning, is based on the coupling of the rotational speeds of the workpiece and the tool. However, the two axes are not parallel but set at a 90° angle to each other. The non- ›

Our simulation-based design of rotational non-round turning processes ensures the highest productivity and quality from the very first part.

Dr. Volker Sellmeier
is Head of Technology Development at INDEX

round contour of the workpiece is generated by the non-round shape of the tool's cutting edge. This non-roundness is transferred to the workpiece through the rotational speed coupling. Otherwise, the process follows the same steps as external longitudinal turning.

10-fold increase in productivity

The benefits of this process are immense. Experimental studies within the ZykloMed project on a TRAUB TNL20 Swiss automatic lathe, involving machining of a titanium bone nail, showed a tenfold increase in productivity compared to time-consuming contour milling. Surface roughnesses in the fine turning range of Ra<0.4 µm were achieved due to the large curvature radii of the cutting edge.

13-fold increase in tool life

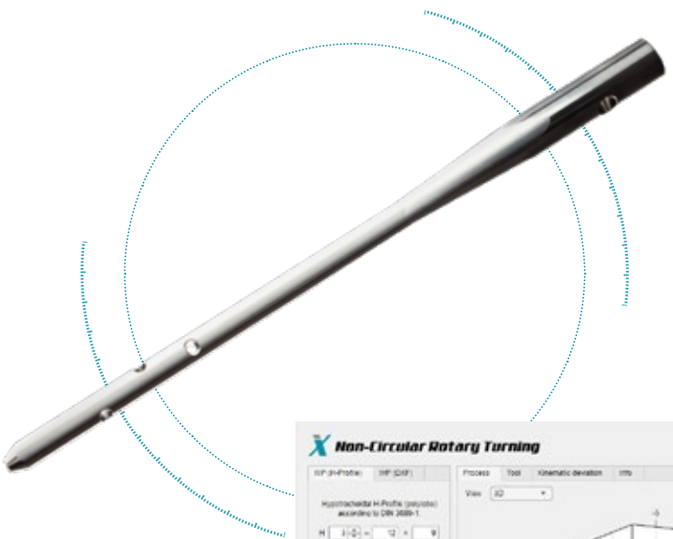
Another significant advantage of the new process is tool life, especially since medical technology often uses hard-to-machine materials like titanium and high-alloy stainless steels, which place high demands on the tools. Unlike conventional turning, where only a small part of the cutting edge is engaged, the entire cutting edge circumference is used in this process.

Each cutting segment is engaged for only a very short time. The tool rotation ensures constant changes, enabling significantly better cooling of the cutting edge. As a result, tool life was 13 times higher than with conventional external longitudinal turning of round profiles. This much more efficient use of carbide also contributes to resource conservation.

Simulation-based design

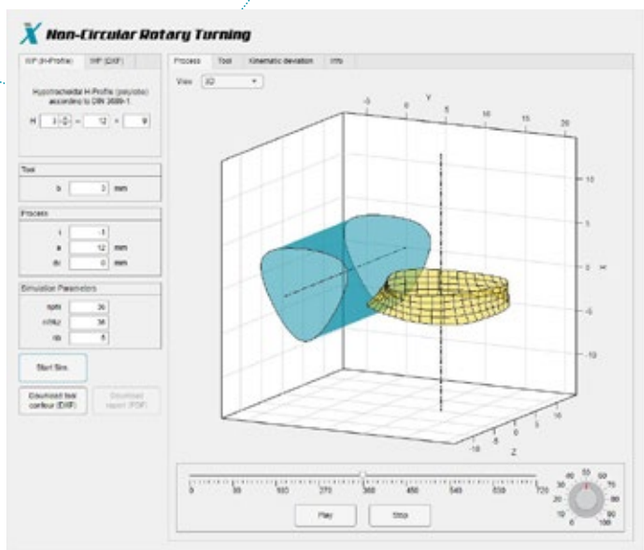
The special challenge of this process lies in the design of the process and the tools. INDEX has developed its own simulation program to easily and quickly determine the most efficient process and the optimal tool considering technological parameters.

INDEX offers this process not only for new machines but also for retrofits of existing machines.



Bone pin

- Ti6Al4V
- Ø 17 mm x 290 mm
- 8 minutes
- TRAUB TNL20
  [fixed headstock/Swiss automatic lathe]



Using the INDEX simulation program, the customer process can be individually designed in advance.

Rotational non-round turning Highlights

- 10 times faster than existing procedures
- 13 times the tool life compared to conventional turning (material: titanium)
- Achievable roughness: Ra < 0.4 µm, Rz < 3 µm
- The TRAUB TNL20 and TNL32 Swiss automatic lathes are very well-suited for this technology

Among other things, Lieb Zerspanungstechnik produces damping technology components for the company Leben GmbH. These applications are relevant for all industries where it is necessary to damp and cushion shocks and vibrations. This ranges from railway technology to machinery and (special) vehicle construction, to cable cars, amusement rides, locks, and crane systems.

Tinkerers from the Allgäu

They exist: turning specialists for whom (almost) no part is too complex, who are happy to deliver quantities of 1 to 5, and who master their machines inside and out. Lieb Zerspanungstechnik GmbH in Burggen/Germany is one such sought-after service provider, with the heart of their machinery being four TRAUB TNA400 and one TRAUB TNA300.

The municipality of Burggen is located in the Upper Bavarian district of Weilheim-Schongau in Germany, a region with gentle hills, meadows, and cows. Industrial enterprises? Absolutely. The region is home to successful medium to large mechanical engineering companies and, accordingly, various suppliers.

Lieb Zerspanungstechnik GmbH is entirely focused on turning and turn-milled parts. Founded in 2009, the company is run by Thomas Lieb and his father Georg. "We have grown steadily over the past few years," says Thomas Lieb proudly. When asked about the recipe for success, he responds: "Our top priority is customer satisfaction. To find the right solutions for their diverse needs, we only employ qualified specialists, whom we also train ourselves. As a result, our workforce has grown from 4 to 22 employees, whose expertise forms the foundation of our success."

For the master precision mechanic, who spends most of his time working on the lathes, the machinery is another key to success: "The quality has to be right and maintained long-term. In this regard, we have had the best experiences with TRAUB machines." His father Georg Lieb invested in a TRAUB TNA400 universal lathe 20 years ago, as it seemed ideal for the transition from conventional turning to NC technology. "The TRAUB TX8-H control system back then was very comfortable and easy to program," says Thomas Lieb. "We still use this machine today. And speaking of long-term precision: After a recent retrofit that included renewing all the guides, it now achieves the precision of a new machine." ›

Guides (Ø 110×120 mm) and bases (Ø 75×50 mm) for cylinders used in damping technology.

This demanding part (Ø 140×320 mm) was machined by Lieb from solid material. It features many grooves, is fully drilled through, and bored out.

Steady rest work from solid material: The parts with a diameter of 110 mm and lengths of 125/270 mm were previously welded raw parts.

The TRAUB TX8-H control system back then was very comfortable and easy to program. We still use this machine today.

Thomas Lieb
is Managing Director of Lieb Zerspanungstechnik

Managing Director Thomas Lieb and the new TRAUB TNA400. The universal machine is compact and easily accessible. All existing tools can be used in the typical TRAUB disk-type turret with VDI40 holders. Important components for Lieb are also the NC-controlled steady rest and the NC tailstock.

We need high rigidity as the basis for precision parts machining. Our shaft parts often require h6 or j6 fits. All our TRAUB machines achieve these accuracies.

Thomas Lieb
is Managing Director of Lieb Zerspanungstechnik

TRAUB TNA universal lathes—ideal for turning service providers

Today, a TRAUB TNA300 and four TRAUB TNA400 lathes of different generations are in the production hall. "For us, these universal lathes are ideal," says Thomas Lieb. This is mainly due to the part spectrum, which essentially consists of demanding shaft parts. Batch sizes range from 1 to 1,000, with orders over 100 pieces being less common than batch sizes of 1 to 5. "Therefore, quick changeovers are very important for us," argues the company head. "We also need high rigidity as a basis for precision machining. Our shaft parts often require h6 or j6 fits. All our TRAUB machines achieve these accuracies. When the temperature conditions are right, I don't have to make a single adjustment for 50 pieces."

The materials processed are mostly steel, from simple construction steel ST52 (1.0570) to quenched and tempered steels like 42 CrMo 4 (1.7225). But even regarding materials, Lieb's turning experts are open to special requests. For example, they handle parts made of pure chrome and titanium for one customer. "For another customer, Leben GmbH, we manufacture components for damping technology. Shock absorbers are similar in design to hydraulic cylinders. However, unlike cylinders, they do not provide propulsion, but dampen movement, for example in buffers for trains."

Turning because it's fun

Thomas Lieb, like many of his employees, is a passionate turner. When asked why he still stands at the machine as a managing director, he answers unequivocally: "If I wanted a desk job, I would have pursued a commercial education." He loves the technical challenge, tinkering with solutions, and manually programming until the desired part that comes out of the machine is perfect.

The new TRAUB TNA400: universal, powerful, and flexible

In May 2021, Lieb invested in the latest TRAUB TNA400, a new-generation machine equipped with NC-controlled steady rest, NC tailstock, the typical TRAUB disk-type turret for twelve tools with VDI 40 holders, and the new TRAUB TX8i-sV8 controller with a large touch display. ›

More customer success stories online:
› **www.index-group.com/success**

"Compared to previous models, the new TNA400 has become even stiffer due to the heavy mineral cast bed, which pays off with longer tool life during roughing and drilling. Plus, we are faster," says Thomas Lieb.

As he is a fan of steady rest turning, the controllable steady rest was a must in the configuration. Thomas Lieb also likes the slightly larger turret compared to previous models: "It offers more space between tools, making the setup process much easier." The fact that the turret indexing movement can be controlled during setup also makes it safer. He also praises a detail of the interior lining: "The cut-out above the main spindle accommodates long boring bars, allowing them to remain clamped."

Thomas Lieb (left) discusses the technical possibilities of the TRAUB TNA400 with Mario Deger (Sales Manager Germany South at INDEX).

Even the new TRAUB TX8i-sV8 control with the 19-inch touch display is seen as a gain by Thomas Lieb, although he admits had to get used to it first, as he likes to stick to tried and true methods. "I quickly adapted to the new way of operating and found it works superbly. Today, I sometimes catch myself swiping the screen on older machines as well."

The Lieb turning specialists particularly appreciate the upward compatibility of TRAUB controls regarding NC programs. "Even programs written over 20 years ago run on the latest TNA400 with minimal adjustments," says Thomas Lieb. "Rewriting takes maybe a minute. We have about 30,000 programs. If we had to create all of them anew, it would be a gigantic time investment."

Turned parts from the specialist

Lieb Zerspanungstechnik GmbH is a family-run supplier company that has been DIN ISO certified for many years.
Its offerings include turned and turn-milled parts up to a diameter of 420 millimeters and a maximum center distance of 3,000 millimeters for mechanical engineering, precision mechanics, hydraulics, and pneumatics. In collaboration with competent partners, it also supplies milled and sheet metal parts and offers grinding and surface treatments. Additionally, Lieb manufactures hydraulic cylinders and individual cylinder components according to customer specifications.

Lieb Zerspanungstechnik GmbH,
Sankt-Anna Str. 35, 86977 Burggen, Germany
› **www.lieb-zerspanungstechnik.de**

INDEX inside

The current global economic situation is marked by significant turbulence. In light of this, our goal is to develop top-tier products for our customers. In addition, we focus on measures such as regional market coverage, optimal customer service, training programs, and technology transfers.

INDEX Open House—industry meeting point

The traditional INDEX Open House in April 2024 was held for the first time at our Deizisau location. Over four days, 2,000 visitors—of which more than a third came from abroad—gathered at the newly established training and demonstration center, the "iXperience Center."

The event showcased the latest machine innovations, automation solutions, and service offerings. The program was rounded out with interesting technical lectures, technology demonstrations, and discussions with experts from across the entire process chain. Once again, we welcomed numerous partner exhibitors from throughout the machining sector. The INDEX Open House has become an important platform for manufacturers and users alike.

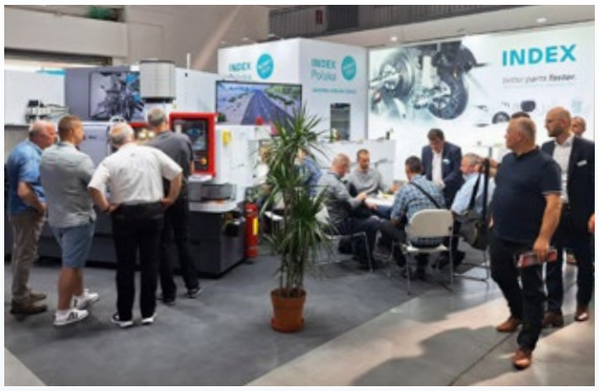
Rainer Gondek // Head of Marketing

INDEX iXperience Center—new service center

This year, we will inaugurate the new iXperience Center service center at the Deizisau location. In addition to the customer training center, it will also house the entire service area, including customer service, hotline, and the demonstration center.

In the modern facilities, we will offer training for our customers and employees on programming, operation, and maintenance, across an area of more than 6,000 m². State-of-the-art presentation technology and equipment ensure highly efficient training processes. Our customers will have the opportunity to experience our products live at the new iXperience Center.

Ralph Herrmann // Head of Service



New INDEX subsidiaries in Eastern Europe

We are pleased to announce that we will be expanding our business operations by establishing our own subsidiaries in Poland, Hungary, and the Czech Republic.

With the strategic decision to strengthen our market presence in Europe, we now offer even better support in sales and customer service to our customers in these countries. The markets in Bulgaria and Slovakia have also been reorganized accordingly. Our well-trained and experienced staff are available to assist you as usual. Contact details can be found on our homepage in the “Sales and Service Search” for the respective regions: www.index-group.com/service-contacts

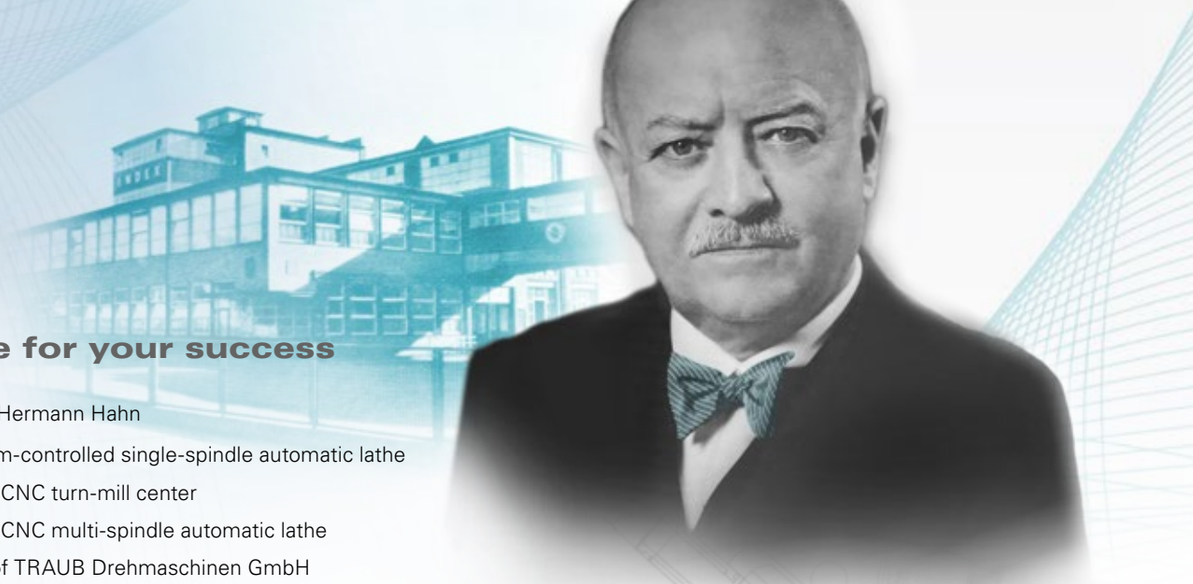
Roger Sachse // Sales Manager Europe

MAKINO and INDEX: the best of both worlds

In the first year of our sales cooperation with MAKINO, we have already achieved initial successes in China, France, and Germany. In Asia, MAKINO has significantly advanced our sales activities, enhancing the market presence of INDEX and TRAUB machines Conversely, our sales teams in Germany and France now also present MAKINO products.

Furthermore, the commitment of both machine tool manufacturers is evident in joint projects. At AMB 2024, a MAKINO a40SE 4-axis machining center will be exhibited with the INDEX iXcenter robot cell for the first time. The partnership between these two premium manufacturers plays a crucial role in supporting our customers in the turning and milling sectors.

Dr. Dirk Prust // Technical Managing Director



Worldwide for your success

1914 Founded by Hermann Hahn

1971 40,000th cam-controlled single-spindle automatic lathe

1983 World's first CNC turn-mill center

1985 World's first CNC multi-spindle automatic lathe

1997 Acquisition of TRAUB Drehmaschinen GmbH

2002 World's first CNC turn-grind center

2005 World's first virtual machine on board

2013 World's first Industry 4.0 platform on board (iXpanel)

2017 iXcenter—automation solutions

2018 iXworld—the world of digital integration

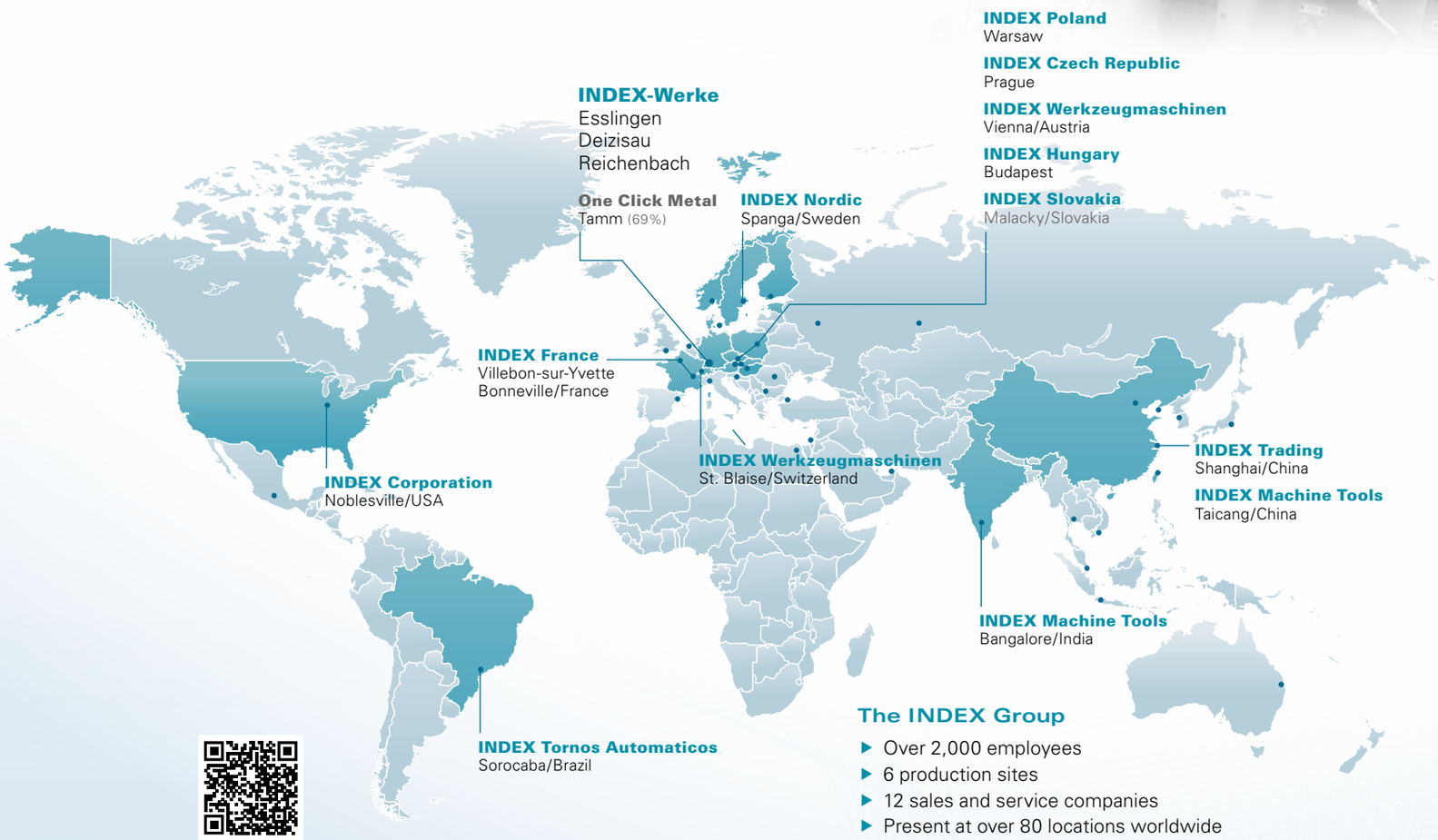
2021 Acquisition of One Click Metal GmbH (3D printing)

2022 Full expansion of the turn-mill program (G series)

2023 World's most successful series application of parallel kinematics with over 3,000 machines (C series)

Sales cooperation with Makino

2024 With its INDEX and TRAUB brands, the INDEX Group is one of the world's leading machine tool manufacturers, specializing in turning, milling, automation, and complete machining.



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The INDEX Group

- Over 2,000 employees
- 6 production sites
- 12 sales and service companies
- Present at over 80 locations worldwide through a global network

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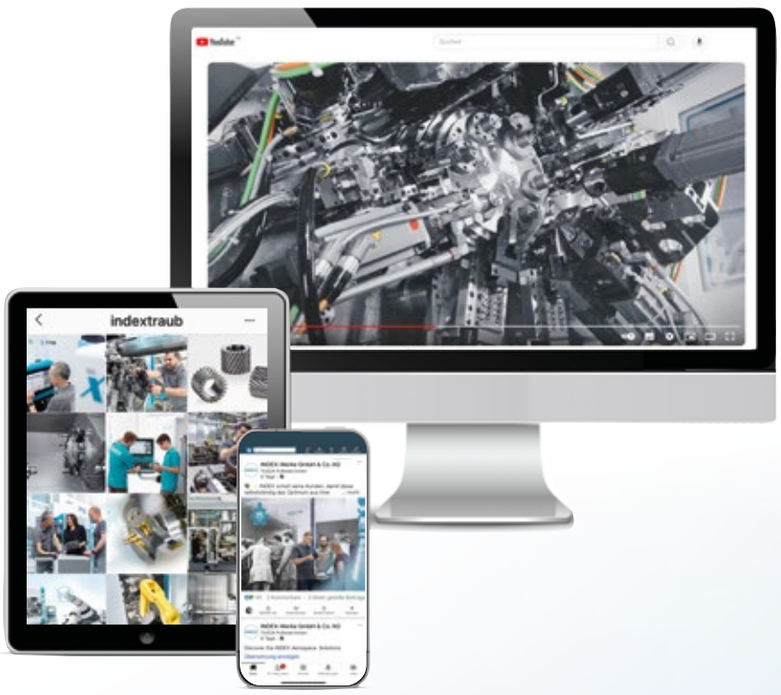
Exhibition and event highlights 2025

IMTEX Bangalore, India	› January 23-29, 2025
MECSPE, Bologna, Italy	› March 05-07, 2025
INDUSTRIE Lyon, France	› March 11-14, 2025
INNOTEC, Bern, Switzerland	› March 11-14, 2025
INTEC Leipzig, Germany	› March 11-14, 2025
OPEN HOUSE 2025	› March 25-28, 2025
INDEX Open House, Deizisau, Germany	
CIMT Beijing, China	› April 21-26, 2025
EXPOMAFE, São Paulo, Brazil	› May 06-10, 2025
ITM MACH TOOL, Poznan, Poland	› June 03-06, 2025
Paris Air Show 2023, Le Bourget, France	› June 16-22, 2025
EMO, Hanover, Germany	› September 22-26, 2025



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INDEX

Efficient production of scroll compressors

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*better.parts.**faster.***