MTM®
Machine Tool Market
SOUTHERN AFRICA
November/December 2025
Volume 34 No.6

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MACHINING INTELLIGENTLY

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MTM®
Machine Tool Market
SOUTHERN AFRICA

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CONTENTS

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VPSS Virtual Prototype Simulation System

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The Amada Product Portfolio includes:
CNC TURRET PUNCH PRESSES, CNC LASER CUTTERS, CNC PRESSBRAKES, NC HYDRAULIC/MECHANICAL SHEARS, SOFTWARE, BANDSAWS, BANDSAW BLADES, SALES & SERVICE.

VPSS
Virtual Prototype Simulation System

Further evolution of a best seller punching machine with drastic set-up time reduction and process integration

Amada's totally integrated approach to sheetmetal fabrication allows you to take part concept and design all the way through to finished production in a single seamless manufacturing environment.

The new AE-NT servo drive turret punch press offers high performance and reduced operating cost in one package

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PRECISION MACHINE TOOLS

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THESE MACHINES SET THE STANDARD FOR PRECISION, SPEED, AND INNOVATION.

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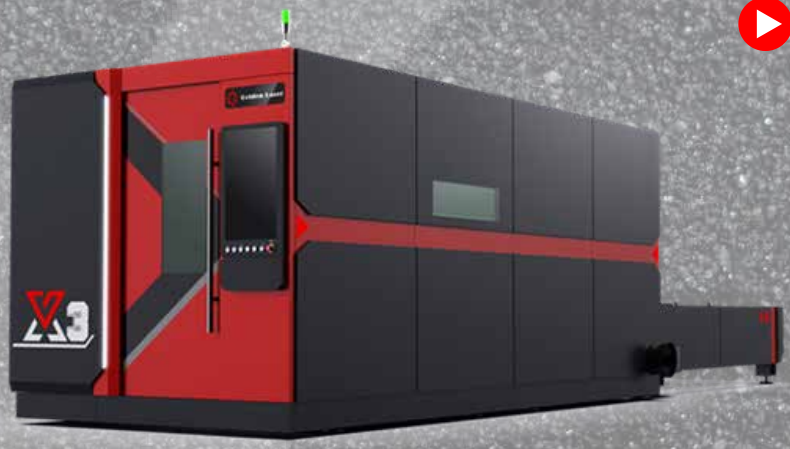

GOLDEN LASER - H SERIES GANTRY LASER

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DISCOVER A ***COST-EFFECTIVE*** ALTERNATIVE TO PLASMA CUTTERS WITH ***UNBEATABLE PRECISION***.

MAXIMUM KW:
30KW

BEVEL HEAD OPTIONAL

WIDTHS:
2500MM/3000MM/3500MM
LENGTHS:
6000MM/9000MM/12000MM &16000MM/24000MM

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Golden Laser

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TUBE LASER CUTTING MACHINE

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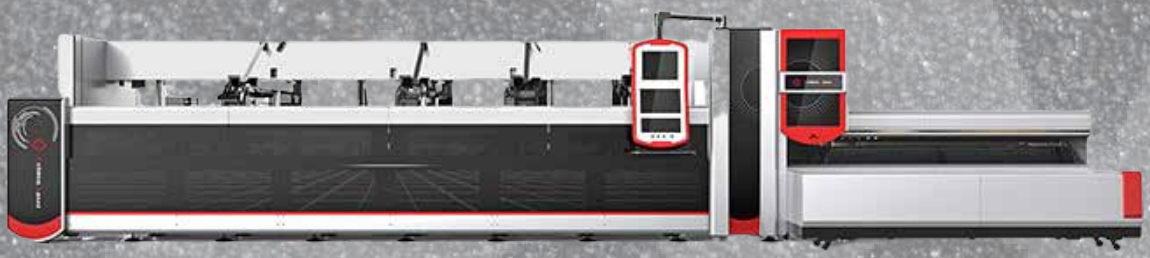
P 2060B
BIGGER MODELS ARE AVAILABLE



GOLDEN LASER HP25 SERIES
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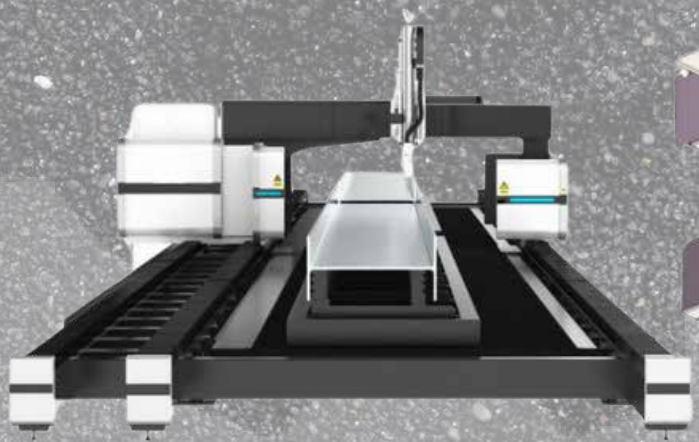
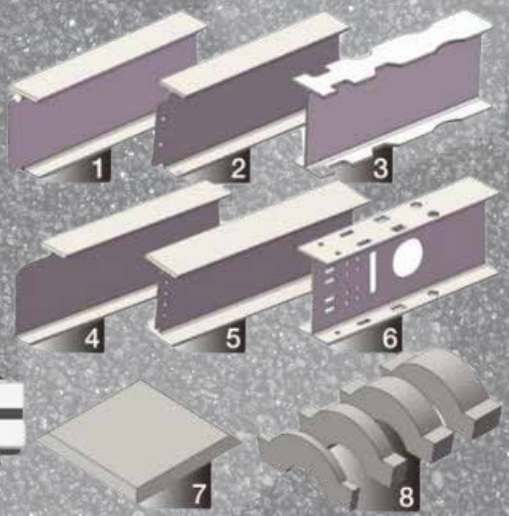
GOLDEN LASER'S HP25 AND HP15
DISCOVER THE ULTIMATE SOLUTION FOR CUTTING ***H-BEAMS, I-BEAMS, CHANNELS, CAN CUT AND BEVEL FLAT SHEET***. THESE PROFILE LASER CUTTING MACHINES ARE ***DESIGNED TO DELIVER***





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AMADA AUTOMATION SOLUTIONS

By Barry Page, Sales Manager, Amada – Johannesburg

The ever-growing need for streamlined production has resulted in companies looking for unique methods of manufacturing with faster production times, less human intervention and ultimately less cost. Labour costs play a massive role in production and the faster a product can be produced, the better the profits.

In the sheet metal industry, this is a difficult target, due to the various stages of production required such as designing, programming, blanking, bending, welding, grinding, painting, assembly, testing and packaging. These various processes are each a headache on their own.

Automation plays a big role in streamlining processes of manufacturing by simplifying processes as well as reducing human intervention.

Blanking – Beginning with the blanking process, the designer needs to have a good understanding of the completed product and its intended use or application. This person also needs to have a good understanding of the machinery being used as well as their distinctive capabilities. They also need to understand the materials being used in the manufacturing process.

The automation process begins in the office with the use of a CAD drawing system. Rendering a 3D model in Amada's Sheetworks 3D software, the full product can be viewed, operated/animated and broken down into single part items. One drawing is now able to program either the punching, bending or laser operation without having to duplicate anything, thus already saving manpower and effort. This process eliminates trial production and the waste of materials, time and resources.

Automated tool change and setup – The options of the Amada PDC (Punch & Die Changer) – holding up to 220 different tools each with two dies or the TSU (Tool Storage Unit) – holding up to 300 tools each with two dies, will automate the loading and unloading of tooling between jobs on the punching machines or laser/punch combination machines.

The tooling is scanned when loaded into the "magazine", thus tying it up with the programming software. Each time a tool is selected to be loaded, it is again scanned by the machine to ensure it is the correct tool and at the correct orientation before loading into the turret. The human error factor is thus eliminated.

Automatic tool hit count on the blanking machine will notify the operator when the tool is due to be re-sharpened, ensuring continuous quality production.

Proto-typing – Ultimately, all proto-typing can be done on a PC in the 3D environment, allowing the customer to sign off for the start of production before a single part or sample is physically produced. The process from creating the drawing to tool fitting and programming and simulating is

executed by a few clicks on the PC mouse. The automated system will then separate material types and material thicknesses, it will nest the parts according to the quantities required and parameters set, then it will program the layout accordingly for the selected blanking machine.

Easy program transfer – Once completed at the programming stage, the programs are transferred from the database to the machine control by means of a job card with a bar code attached. The use of a bar code scanner at the machine control will instantly display the program and render it immediately available for production to commence.

The scanning of the barcode will ensure that production throughput is handled in the correct sequence as required, thanks to the ability of the programmer who creates a production schedule according to assembly or delivery needs.

Automated machine attendance – Once ready to begin with the actual production, there is an additional automation option for material storage and material handling, too. These automation (retrofittable) systems – ASFH or ASR (Tower Storage Systems) and MPL (Material Manipulation System) are capable of loading the raw material sheets onto the table of the blanking machine after confirming the sheet thickness, ready for production to begin. All of this is possible without the operator having to touch the sheet.

Automated sheet removal/part sorting – Once the sheet has been processed, it is off-loaded by means of the manipulator system. It then

is either stacked on a pallet, complete with skeleton and parts or it can be separated by means of a "TK" system. This "TK" (Take Out) system is ideal for the removing and sorting of cut parts from a nested sheet. The part "picker" will remove each individual part from the skeleton by means of numerous individually controlled suckers and will place them onto different stacking pallets, thus sorting parts for different customers or for different secondary processes. Different customers' parts that were nested together on one sheet can easily be sorted without any human intervention. Continuous, unmanned production is now possible around the clock.

Repeat production of the same components is simplified, thanks to the electronic storage of all machinery setup data in the VPSS database, processing sequences, tooling requirements and bending data are all stored for future need.

Once the blanking process is taken care of, it becomes a bending issue. This is where the final products' appearance and appeal will come to light.

Bending automation – Bending can also be automated according to the customers' needs by utilizing Amada's VPSS4ie Bend Software and creating all bending programs from the initial 3D drawing that was used in the blanking process. Sequencing and tool fitting is done on the PC automatically and allows for human intervention/over-ride. Program simulation on the PC eliminates trial bending on the machine. The "teach" function on the control of the bender will assist and indicate the precise positioning of each tool as required, while prompting the operator through the bending process.

Automated tool load/unload – In the case of the ATC (Automatic Tool Changer), the machine will automatically load and unload tooling as required for the bending job at hand. The ATC automated tool placing function will drastically reduce setup times between jobs as it can load a full three meters of top and bottom tooling in just three minutes.

Suddenly the small batch production runs or single part production becomes a different game and a faster process with far less down-time.

Robotic bending – For long constant production runs, robotics are available to replace operators, thus ensuring continuous around the clock bending. The robotics are ideal for constant bending of the same parts or very large production runs. These systems are available in a variety of sizes of machine capacities, from the very small robotic systems on the EGB press brakes, right up to the large, heavy duty press brakes handling parts that are too heavy for the operator.

The age old saying goes, "every sport has its injuries" and this saying bodes so true in the production environment of a busy workshop. Traceability and accountability is the next headache and is key to any successful production system.

Automatic production feedback & traceability – Amada can now also offer their "My V-Factory" production monitoring software package. This monitoring system is linked to the Amada equipment on the shop floor and provides feedback on the status of the equipment being used. Things like production times, set-up times, alarm times and stand-by times are all recorded and allow constant monitoring of the productivity of individual machines. Continuous problems can be identified and attended to, in order to streamline production.

The remote log-in from an authorized mobile device allows authorized personnel to stay up to date and to keep customers updated on the progress of their production when deadlines are tight.

Automatic satisfaction – All equipment supplied by Amada is designed, developed and fully supported by Amada directly. The Japanese ethos of quality and reliability resonates through the thousands of machines supplied and hundreds of satisfied customers around the world.

With this total solution, ONE company supplies everything, all support is in-house and everything is programmed through a central Amada data-base (VPSS4ie).

Amada's dedicated sales, applications and service teams are eager and available to explain and demonstrate the full Amada solution at your request and at your leisure.

For more information, please contact Amada – Tel: 011 453 5459.

MAKING THE MOVE TO MULTI-TASKING

By Paul Savides, Managing Director, PBS Machine Tools

Generally, to meet High-Mix Low-volume production, you require numerous standard machining approaches that need to use drawn-out, multi-step processes with single-spindle machines, which are not a great fit for high-precision engineering shops, especially, those looking to expand from one-offs to production orders.

Paul Savides Managing Director, PBS Machine Tools.

Parts with complex milled features or multiple milled faces that require a secondary machining operation on a separate machine after initial turning not only extended cycle and setup times but also introduced the risk of tolerance stacking and alignment errors, due to re-fixturing or relocating to the second operation. Even parts with seemingly larger permitted tolerances can require closer attention to dimensional stacking, demanding even tighter tolerances.

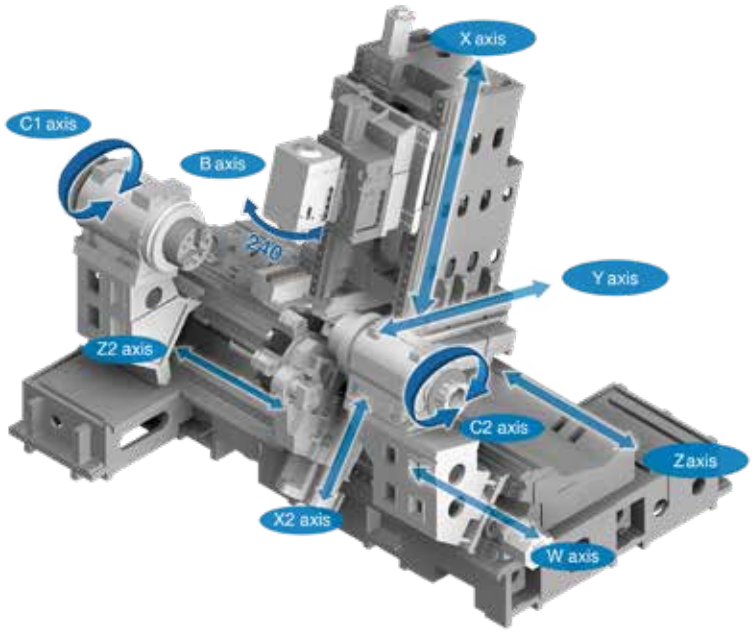
As an example, to make medical parts, even in the hands of a skilled machinist, creating the tool paths that can accurately machine these part shapes, is ineffective. Unfortunately, the part geometries are mostly outside a standard CNC machine's capability range, due to time-consuming processes on single-spindle, single turret machines.

Multitasking – Where High Requirements Meet High Volumes

Purchasing a Multi-Tasking machine to handle complicated turning geometries like gear cutting, five-axis work and more.

Twin-spindle, twin-turret setups with live tooling and Y-axis machining capabilities provide more flexibility than most machine shops are familiar with.

While machine rigidity will prove useful right away for you, it will take time before you fully trust the machine's advanced features and then fully utilize them. By cautiously experimenting with simultaneous **Pinch-Turning** and **Pinch-Milling,** you will be amazed how processing this way maintains tight concentricity and straightness, especially on long, thin



parts and how it cuts cycle times, by enabling simultaneous roughing and finishing operations.

Pinch-Turning can also reduce setup times by eliminating the need for steady rests and rotating centers for some operations, making you more agile and efficient as it progressively allows for increased annual part volumes.

New Features, New Parts

High Dynamic and **Eccentric Milling** capabilities sharply cut setup and cycle times, and therefore, by taking advantage of Tongtai Group's numerous Multi-Tasking solutions that provide rigidity, advanced cutting features and a done-in-one architecture to reduce setup and cycle times, will make you more competitive.

Our **TMS series** represents Tongtai's commitment to process integration and machining efficiency. Designed as a full multi-tasking turning center, TMS combines live tooling, symmetric Y-axis movement, dual spindles and substantial structural rigidity, making it ideal for gear machining and complex shaft-type components.

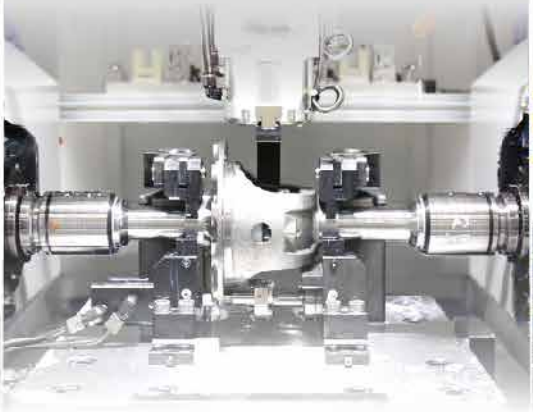
The C-axis indexing accuracy and servo synchronization between spindles ensure precise angular positioning, essential for gears and coupling components. Five-axis milling integrated into a multitasking platform, significantly reduces the need for multiple setups and fixturing and will have a substantial impact on repeatability, throughput and overall process

Cont. on page 10 ☞

S Standard Machines

- Vertical machining center
- Horizontal machining center
- 5-axis machining center
- Drilling and tapping center
- Horizontal CNC lathe
- Vertical CNC lathe
- Ultrasonic assisted machining center
- Additive manufacturing equipment

O Options



- Special Purpose Machine (S.P.M.)
- Industry specific machines
- Product customization
- Various functional modules

I Intelligent Integration

- Turnkey solution
- Intelligent/Automated solutions for single machines
- Intelligent/Automated solutions for production lines
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☞ *Cont. from page 8*

efficiency, especially for high-value, low- to mid-volume components.

Cycle times can be reduced by up to 50% and setup time by up to 75%, depending on part complexity.

High Dynamic and Eccentric turning can be particularly impactful

In **Dynamic turning,** programmers can adjust the approach angle of the cutting tool in mid-operation. Also, tools with different cutting edges, suited to roughing, profiling and finishing, can mean performing multiple operations without tool changes.

Eccentric turning enables the machining of off-centre bores without specialty off-centre work-holding thus, eliminating the cost of custom fixturing and work-holding, while improving productivity, accuracy and setup time.

Bonus Features

While Multi-Tasking machines can expand your current capabilities, it can help you gain a foothold in gear cutting. Across South Africa's manufacturing landscape, gear production plays a vital role in industries, such as mining, heavy equipment and the automotive aftermarket.

These sectors demand gears and splined shafts that meet tight tolerances. They must be produced efficiently, despite smaller batch sizes and growing part complexity. Implementing **Gear cutting** and the newer **High Dynamic** and unconventional **Eccentric turning** features will require use of **digital twin** simulation software and advanced Espirt Edge CAD/CAM software, to match the physical machine and its kinematics, so every tool index or collision risk that could exist is anticipated and addressed in the programming office.

Servicing an Ever-Increasing Pace

As these complex machines can complete nearly every part that crosses the shop floor, downtime could significantly hamper operations, most of it due to user error or lack of maintenance, however, thankfully Tongtai machines rarely see downtime. Even in these situations, our Intelligent Software assists with a troubleshooting feature that displays likely problem areas, such as Axis overloads and oil levels etc., while operators can quickly bring the machine back online, making a service call unnecessary.

To meet the production levels for newer jobs, it's feasible to run two 12-hour shifts, one staffed and one unstaffed.

To prevent issues with outdated programs and help with traceability for high-requirement jobs, it is recommended to setup a programming department to ensure all changes to part programs are done in the right environment.

All these machine features will help expand your business significantly. By adding robotics, a custom ERP and continued investment in capable machines will help users grow even further.

We're not just suppliers — we're solution partners.

At **PBS Machine Tools**, we specialize in helping partners upgrade production, optimize capacity and access reliable equipment, not just by offering good pricing, but by delivering **fit-for-purpose solutions,** tailored to real production goals.

With our 35-year network of long-standing manufacturers and engineering teams, we support:

- New and certified pre-owned machines
- Custom-built lines for special parts or applications
- Spare parts, tooling, installation and post-sale support
- Government-level cooperation on industrial programs

We'd be glad to learn about your current focus, whether you're exploring upgrades or future investments.

Special Note

I'd like to leave you with this:

From Defining to Preventing Errors

Four techniques to have in your toolbox for averting errors are

1 **Process Thinking –** The best way to prevent error is to have a process.

2 **SPC –** Once there is a stable process, one can utilize tools like SPC to make variation visible to everyone.

3 **Poka-Yoke systems –** These prevent mistakes as, the human element is a potential point of failure, due to training and operator led work stoppages, which are not true Poka-Yokes, so they need to be automated.

4 **Redundant Systems –** Close-tolerance dimensions need to be checked with multiple gauges to ensure continuous operation in case of failure. This strategy increases reliability.

For more information, please contact PBS Machine Tools – Tel: 011 914 3360.


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BYSTRONIC ADDS FLEXIBILITY TO UNLOADING AND SORTING OF LASER-CUT PARTS

Increase your level of automation with Bystronic's BySort

BySort is the new extension module for the ByTrans Cross loading and unloading automation system. The upgrade sorts the completed cut parts and thus accelerates the automation cycle of all the processes related to fiber laser cutting.

With the newly developed BySort upgrade, the ByTrans Cross is now an even more versatile unloading solution. An additional bridge is installed on the ByTrans Cross system, which can accommodate up to two sorting heads. These heads are automatically tooled using the available gripper modules.

The BySort is designed to deposit the completed parts on an additional unloading position next to the laser cutting system, which offers ByTrans Cross users an even higher degree of flexibility. Amongst other things, this supports users with the processing of large series where the individual cut parts need to be unloaded and sorted separately according to jobs. The repetition accuracy with which the BySort deposits the parts is a great advantage. Particularly with large cut parts, this is difficult to achieve manually. The accurate positioning of parts on palettes facilitates the automation of subsequent processes, because it allows the precise position detection of the parts to be further processed.

Moreover, BySort increases the speed of the entire unloading process. Bystronic achieves this thanks to the efficient design of the system unloading routes. In a first step, BySort unloads and sorts the cut parts. Subsequently, using a different route, the ByTrans unloads the residual sheet. This ensures that the laser cutting system's shuttle table is more quickly available for the loading of the next sheet, which the ByTrans Cross fetches from its own stock or from the connected warehouse.

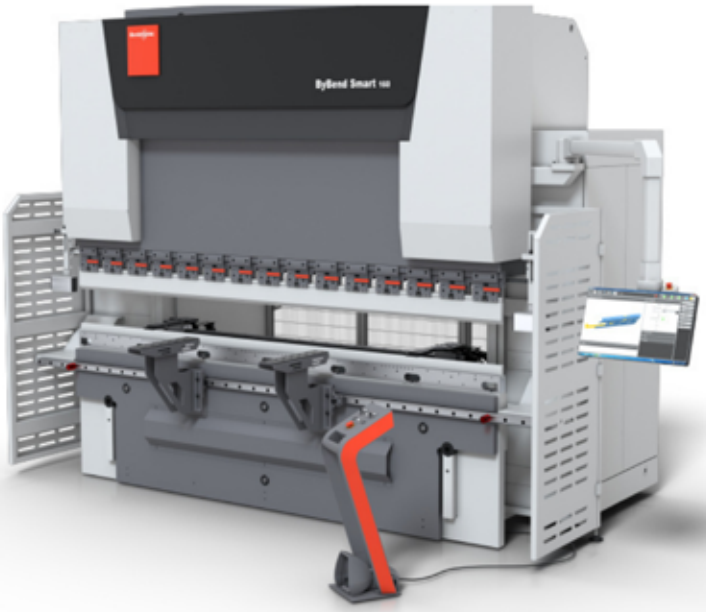
Integrated control on the touch screen

Both the BySort and the ByTrans Cross are controlled using the laser cutting system's touch screen. To achieve this, Bystronic developed the ByVision Cutting user interface, which is already being used with the latest generation of Bystronic's fiber lasers. ByVision Cutting integrates all the cutting processes and the connected automation solutions. During everyday production this allows laser cutting and the automated material feeding and removal process to be closely interlinked. Nowadays, no user should waste time, walk long distances, and carry out unnecessary procedures, just because the laser cutting system and the connected automation solution have to be operated using separate terminals. After all, for the operator, automation also means convenience.

For more information,
please contact Cutronic – Tel: 010 410 0200.

CUTRONIC

SMARTER TOGETHER



- Laser Cutting
- Press Brakes
- Tube Laser Cutting
- Laser Welding
- Automation
- Software

The sheet metal industry is more than our business, it's our passion. At Cutronic, we deliver cutting-edge Bystronic and DNE solutions designed to empower you with precision, productivity, and performance. Together, we shape success - one smart solution at a time.

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DNE LASER

Authorised Bystronic and DNE Laser Dealer

HIGHLY FLEXIBLE LOADING AND UNLOADING AUTOMATION SOLUTION FOR LASER SYSTEMS

ByTrans Modular

Laser cutting with speed –
Automated loading and unloading of laser systems

The ByTrans Modular is an advanced loading and unloading automation. It injects extra speed into your Bystronic laser cutting machine, both for large series and for small jobs.

The variety of configurations and layouts allow choosing the best solution. This eliminates the need for manual loading and unloading. The system takes care of it for you.

Watch video

Straightforward control –
User-friendly touch screen

The new software features enable you to easily control your automation from the touch screen of your laser cutting system. In addition to the standard scope of supply you can also connect additional control panels to have a better overview and management of the overall cutting cell.

Automation drives high productivity –
Perfectly tailored to your requirements

The ByTrans Modular offers you an extremely high level of configurability, allowing you to choose the best solution to improve the productivity of your laser systems, easing also your operator's workload.

Seamless integration –
Easily upgrade whenever required

The ingenious system architecture enables native interfacing with Bystronic's next-generation storage solutions. Reach the next level of productivity by connecting the system to BySort. You can even use your ByTrans Modular to manage two laser systems within the same automation setup.

For more information,
please contact Cutronic – Tel: 010 410 0200.

ByTrans Modular
Flex 1 & BySort

The fully automated solution from the raw material to the final sorting process

ByTower Cross 2T

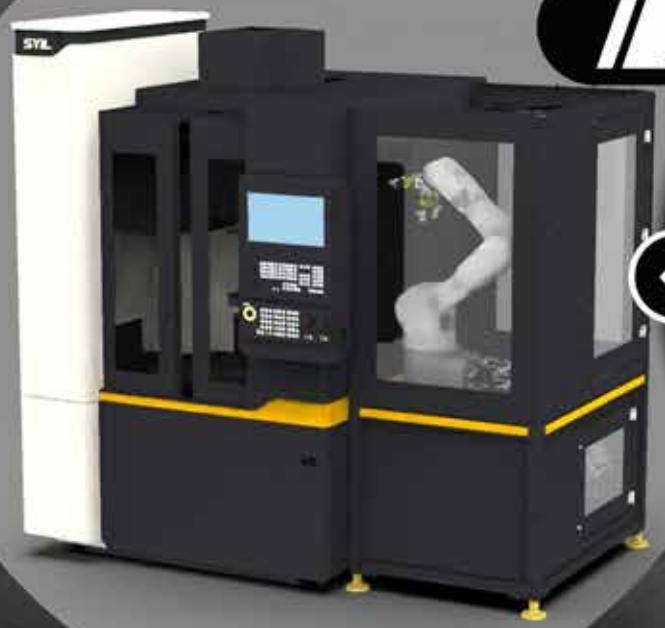
CNC MILL AUTOMATION

TRANSFORM YOUR BUSINESS BOOST PRODUCTIVITY CREATE A COMPETITIVE EDGE

HURCO + ProCobots

Hurco and ProCobots™ have created practical job shop automation products that are affordable, practical, flexible, compact, and eliminate the need to call an expensive integrator every time you need changes or move the system to different machines. With compact foot-prints that don't require intrusive safety fencing, the ProCobots™ collaborative robots can work safely with your machinists instead of replacing them.

SYIL + KUKA



SYIL R1 Machine Tending System, a complete automation solution that is quick to install and easy to operate from your SINUMERIK 828D. The R1 removes manual and repetitive tasks from your CNC operations by automating the loading and unloading process.

Built with KUKA's reliable 6-axis robot, the SYIL R1 Machine Tending System is the perfect solution for high-mix, low-volume tasks.

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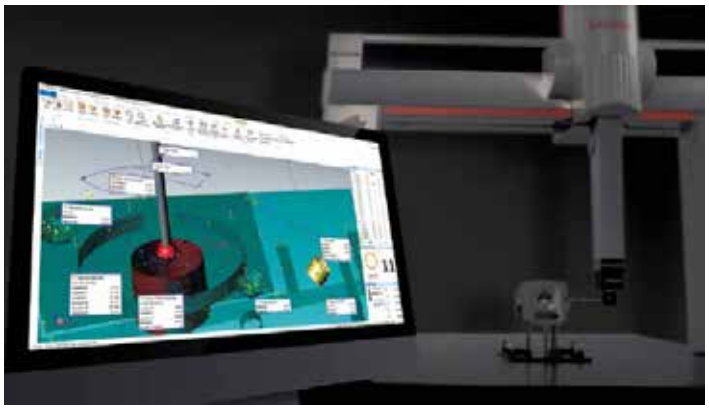
MAKE THE MOST OUT OF YOUR CMM WITH MITUTOYO MCOSMOS v5

The well-known software suite, MCOSMOS, is recognized as the go-to data processor for Mitutoyo's range of top-of-the-line CMMs. Supported by an extensive line-up of optional software applications, users have full control over a wide range of probe systems ready for any kind of workpiece.



MCOSMOS v5 – CMM data processing software.

MCOSMOS helps you carry out all your measuring and test jobs at lightning speed, simply and safely. MCOSMOS handles large amounts of data with ease, making it available across all the networked areas of the production chain. This streamlines the measuring process, optimizes the flow of information and minimizes non-conformances. The result is increased efficiency throughout the production process with significantly reduced costs.

With its specialist expansion modules, MCOSMOS can focus on your company's very specific measurement requirements. With Mitutoyo software, you are best prepared for every imaginable 3D coordinate measurement challenge, both now and in the future with maximum flexibility.

MCOSMOS is the smart software platform from Mitutoyo, setting international standards for sophisticated 3D coordinate measurement. With MCOSMOS, your coordinate measuring machines become efficient information centers – powerhouses of design, production, and quality control. Streamlined measurements, as well as convenient and reliable data, are at your fingertips throughout the production process.

Watch video

Modelled with a modern design, this **New Graphical User Interface (GUI)** improves on the previous version with a simplified and attractive module display, while an **Improved Search Function** has been designed to assist users in their quest for specific elements of their measuring program, and thus editing has become even easier when compared to version 4. Added in this new version of MCOSMOS, is the possibility of using a **3D Display of the Geometry and Microstructure** of technical surfaces including visualized tolerance zones, providing operators with a more detailed overview of the workpiece.

The function "Support of **Two-Point Size of Planes** according to ISO 14405-1" gives MCOSMOS the capability to evaluate the two-point size of two selected planes, which both were calculated by least squares (Gaussian) method.

A large amount of progress has been made in Mitutoyo's **Optimization for Large CAD Files** over their previous versions of software, lowering process time and improving the overall operation of MCOSMOS and toolbars are replaced by **Ribbon Control, Including Contextual Tabs.**

For more information,
please contact RGC Engineering – Tel: 011 887 0800.

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ACHIEVE EXCELLENCE IN MANUFACTURING WITH CUTTING-EDGE TECHNOLOGY

Elevate Your Manufacturing Game with TaeguTec

In the competitive landscape of South African manufacturing, efficiency and cost-effectiveness are paramount, and the manufacturing sector in South Africa is diverse and dynamic, encompassing industries, such as automotive, aerospace mining and heavy machinery. These industries are pivotal to the country's economic growth, providing employment opportunities and contributing significantly to the GDP. However, they face challenges such as rising operational costs, the need for technological advancements and global competition.

To thrive in this environment, South African manufacturers must adopt innovative solutions that enhance productivity and reduce costs. TaeguTec's cutting-edge solutions include the SOLID-3-DRILL, DRILL-SFEED, RHINO-TURN, SFEED-BARREL, CHASE-8-SFEED and WIN-MILL lines.

These innovative tools are designed to revolutionize machining processes, offering unparalleled benefits that can significantly enhance productivity and reduce operational costs.

SOLID-3-DRILL –Precision and Performance

The SOLID-3-DRILL is a game-changer for industries, requiring high-precision drilling. Its higher number of teeth increases productivity, while its unique three-flute design ensures superior chip evacuation, reducing cycle times and enhancing hole quality.

This drill is particularly beneficial for industries, such as automotive and aerospace, where precision is non-negotiable, as well as for companies that demand excellent performance in steel and cast iron machining. By minimizing tool wear and maximizing cutting efficiency, the SOLID-3-DRILL helps manufacturers achieve higher throughput and lower per-unit costs.

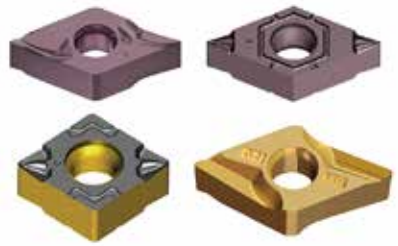
DRILL-SFEED – Speed Meets Efficiency, 3-Flute Indexable Drill

For industries looking to boost their drilling speed without compromising on quality, the DRILL-SFEED is the ideal solution. This high-feed drill is engineered to operate at higher speeds and feeds, significantly reducing machining time. Its robust design, strong cutting edges and latest coating technology combine stability, longevity and high productivity, making it a cost-effective choice for high-volume production environments.

By reducing cycle times and increasing tool life, the DRILL-SFEED enables manufacturers to meet tight deadlines and reduce overall production costs. Its original clamping structure allows for the simple replacement of drill heads, as well as varying sizes of heads onto a single tool body, thus facilitating economical end-user drill stock management.

RHINO-TURN – Versatility and Durability, Small but Strong

Turning operations are a critical aspect of many manufacturing processes and the RHINO-TURN line offers unmatched versatility and durability. Designed to handle a wide range of materials, from steel to exotic alloys, RHINO-TURN tools provide consistent performance and extended tool life.



This versatility reduces the need for frequent tool changes, thereby minimizing downtime and increasing productivity. Additionally, the enhanced durability of RHINO-TURN tools translates to lower replacement costs, further driving down operational expenses.

SFEED-BARREL – Innovation in Milling

The SFEED-BARREL line represents the pinnacle of innovation in milling technology. Its unique barrel-shaped design allows for larger step-over distances, reducing the number of passes required to achieve the desired surface finish. This not only speeds up the milling process and reduces machining time, but also improves surface quality.

Cont. on page 20 ☞

WINMILL
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New Generation 90° Shoulder Milling Insert with High Ramping Capability

CHASE8SFEED
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DRILLSFEED
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Head Changeable 3 Effective Cutting Edge Drills

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☞ *Cont. from page 18*

The SFEED-BARREL is particularly advantageous for industries, such as mould and die, where surface finish and dimensional accuracy are critical. By optimizing milling operations, this tool helps manufacturers achieve higher productivity and lower costs.

CHASE-8-SFEED – High-Feed Milling Excellence

The CHASE-8-SFEED line is designed for high-feed milling applications, offering exceptional performance in roughing operations. Its innovative geometry allows for higher feed rates, reducing machining time and increasing productivity.

The robust construction of CHASE-8-SFEED tools ensures long tool life, making them a cost-effective choice for demanding milling tasks. By enhancing material removal rates and minimizing downtime, CHASE-8-SFEED tools help manufacturers achieve significant cost savings.

WIN-MILL –Precision and Flexibility

WIN-MILL tools are engineered for precision milling applications, providing excellent surface finish and dimensional accuracy. Their versatile design and V-bottom for rigid clamping allow for use in a wide range of materials, making them ideal for industries, such as mould and die, aerospace and automotive.

The high-performance capabilities of WIN-MILL tools reduce the need for secondary operations, thereby increasing productivity and reducing overall production costs.

TaeguTec Advanced Edge

The SFEED-TEC and WIN-SFEED family of cutting tools offer advanced solutions for various machining applications. SFEED-TEC tools are designed for high-speed and high-feed operations, providing superior performance and extended tool life. WIN-SFEED tools, on the other hand, are optimized for stability and precision, ensuring consistent results in demanding environments. Both lines contribute to increased productivity and reduced operational costs, making them valuable assets for South African industries.

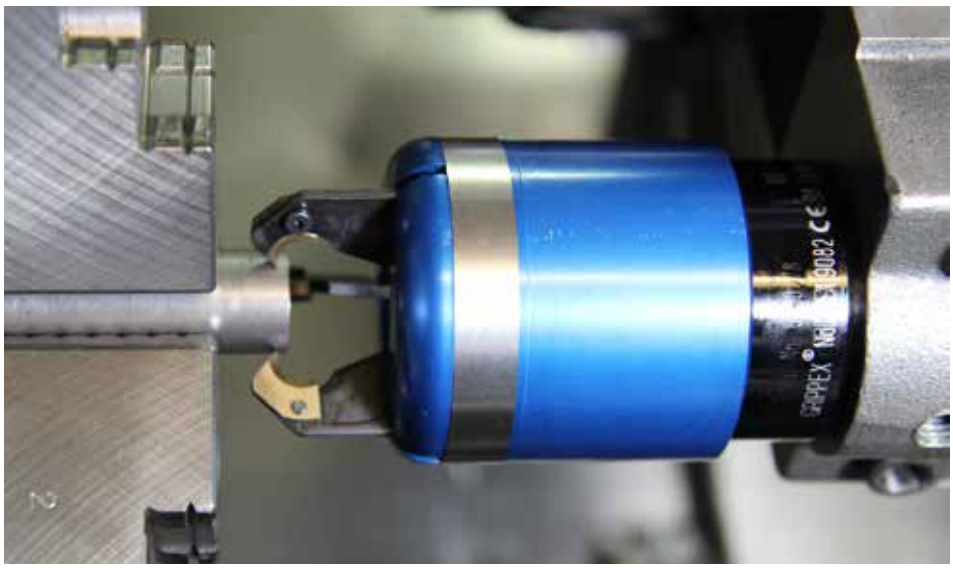
TaeguTec's SOLID-3-DRILL, DRILL-SFEED, RHINO-TURN, SFEED-BARREL, CHASE-8-SFEED, WIN-MILL, SFEED-TEC and WIN-SFEED lines offer South African industries a competitive edge. These cutting tools are meticulously designed to enhance productivity, reduce cycle times and lower operational costs. By integrating TaeguTec's innovative solutions into their manufacturing processes, South African manufacturers can achieve greater efficiency and profitability, positioning themselves for success in the global market.

For more information, please contact TaeguTec – Tel: 011 362 1500.

GRIPPEX – POWERFUL COOLANT DRIVEN BAR PULLER AND PICK-UP UNIT

Grippex is the bar puller that makes a CNC lathe more effective right away

For various reasons, such a high costs or limited floor space in workshops, a small percentage of the CNC lathes are equipped with some kind of magazine-type bar feeder. In small-batch production, however, the machine spindle itself, in addition to its inserted guiding tube and Grippex, provides you with a simple and highly efficient bar feeder.



Highlights include instant setup and gripping secured without any adjustment within the whole gripping range. The pick-up unit is compact and light and adjacent turret tool positions need not be empty. While powerful and standing high pressure up to 20 bar, Grippex doesn't need high pressure for pulling properly. It can work from 0,5 bar onward.

Grippex clamps very close to the chuck, allowing short overhang of the bar, while clamping hexagon bars without need for spindle orientation. It can also be used as a pick-up unit with robot jaws.

For more information, contact Duncan McDonald – Tel: 011 865 4090.

CUTTING DATA AND CUTTING CONDITIONS

"It is a capital mistake to theorize before one has data." – Sherlock Holmes

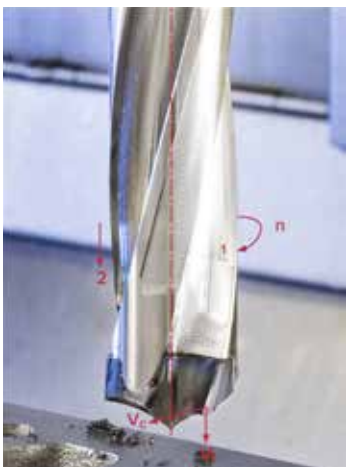
Generally, cutting data relates to quantitative variables that determine running a cutting process numerically. Cutting data can also be referred to as cutting parameters. Cutting data consists of cutting speed, feed, depth of cut, width of cut, machining allowance (stock), number of passes and tool overhang plus additional parameters that depend on specific features of a particular machining operation. For example, these parameters include the spindle speed that characterizes a rotating workpiece or tool in cutting with rotational primary motion, step-over and step-down, which define a tool displacement in radial and axial directions after every pass in milling. Even though cutting data is often identified with cutting conditions, its actual value is questionable. Cutting conditions typically include machining factors that are difficult to quantify. For instance, unfavourable cutting conditions relate to a whole set of reasons, such as workpiece with skin (siliceous or slag, for example), significantly variable machining allowance that leads to changing the depth of cut, considerable impact load, due to non-uniform machined surface and surface with high-abrasive inclusions.

In another case, unstable cutting conditions refer to the low stability of a complete machining system, including machine tool, workpiece holding fixture, cutting tool and workpiece, due to poor tool and workpiece holding, high tool overhang, non-rigid machine tools and thin-walled workpiece.

Principally, the terms "unfavourable" and "unstable" cutting conditions are not interchangeable. However, despite their differences in definition, these conditions are related through cause and effect and are sometimes used as synonyms in certain contexts.

In characterizing cutting conditions, the terms "heavy" and "heavy-duty" machining are often used improperly. Moreover, these terms are sometimes mistakenly regarded as synonyms. In principle, "heavy machining" refers to machining large-sized and heavyweight workpieces on powerful machine tools, primarily relating to the dimensions and mass of the workpiece. In contrast, "heavy-duty" specifies a degree of tool loading and mainly characterizes a mode of machining.

A "Golden Rule" for manufacturing engineers, process planners and machinists states: "Avoid heavy-duty machining under unfavourable conditions, especially if your technological system is unstable!



To summarize, a general description of cutting conditions depends on various aspects that are difficult to define. In many cases, finding cutting data for a specific machining operation is relied upon the user's estimation of cutting conditions related to light, normal and hard. In primary motion, the points of a tool cutting edge move with appropriate velocities. The maximum velocity is the cutting speed $\mathbf{v_c}$. For example, in drilling a hole by a drill rotating with rotation velocity n, the cutting speed is the circumferential velocity of the point farthest from the drill axis. In fact, the cutting speed is the relative linear speed between the cutting tool and the machined surface of a workpiece. For a rotary body of diameter R, the circumferential velocity v is defined by the following equation:

$$\mathbf{v=\omega \times R} \qquad (1)$$

ω – angular velocity in radians per second (s^{-1})

In machining, rotation velocity in revolutions per minute (RPM, rpm) is used instead of angular velocity in radian per second. The cutting speed is measured in meters per minute (m/min) in metric units and surface feet per minute (SFM, sfm) in US customary and imperial systems.

v_c can be calculated as below:

$$\mathbf{v_c=\pi \times d \times n/1000\ m/min} \qquad (2a)$$

and $$\mathbf{v_c=\pi \times d \times n/12 \approx d \times n/3.82\ sfm} \qquad (2b)$$

d is the diameter of a rotating tool in milling, drilling etc. or workpiece in turning that is expressed in mm in equation (2a) and in inches in equation (2b). Because both the rotating tool and the workpiece are mounted on a machine tool spindle – a part intended to transmit torque – rotation velocity **n** is often referred to as spindle speed.

Another velocity – feed speed $\mathbf{v_f}$ – determines a feed motion. In fact, this is the speed at which the tool advances into the workpiece. There is a difference between feed speed and feed. The feed **f** is determined by the distance, which the point of a cutting edge travels along its path in the feed motion, to the appropriate number of cycles of another cutting motion. One revolution of a tool in milling or a workpiece in turning stroke in shaping – these are the examples of such a cycle. In the above case of drilling, the cycle is one revolution of a drill.

In North American countries the term "feed rate" is often used instead of the ISO definition "feed speed". The less common term "advance" is a synonym for "feed", like "advance per tooth" and "advance per minute" mean the same as "feed per tooth" and "feed speed". Manufacturers can refer to "feed speed" as "table feed". The original term refers to a classical machine, especially from previous generations, where feed motion was created by movements of the machine table.

In milling, the term "chip load" is commonly considered as a synonym for the term "feed per tooth". This term is also more typical for the North American market. However, the correct synonym for "chip load" is "chip thickness". In shop talk "chip load" relates usually to maximum chip thickness.

If the feed corresponds to one revolution of a tool or a workpiece, it is known as feed per revolution and designated also as **f** or, more rarely, **fr**. Feed per revolution is a common characteristic for machining processes like turning, drilling, countersinking etc.

In processes like shaping, planing and slotting, feed motion features double strokes that comprise forward (cutting) and backward (return) strokes. These processes are specified by feed per double stroke (sometimes simply feed per stroke if word "double" is omitted) **fs**. In many cases, however, feed per double stroke is denoted also by **f**.

In multi-point (multi-edge) cutting tools having teeth or flutes, feed per tooth **fz** is used. This is the feed that corresponds to rotation by one angular pitch of the tool teeth (flutes).

It is easily seen that:

$$\mathbf{f=fz \times z} \qquad (3)$$

where **z** is the number of tool teeth (flutes)

Cont. on page 24 ☞

YOU TURNING INTELLIGENTLY?

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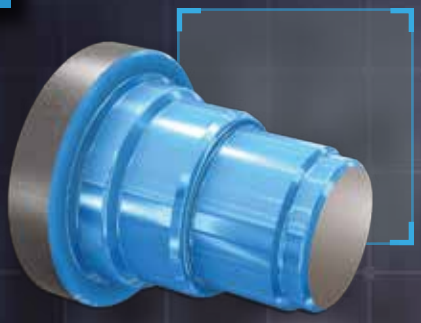

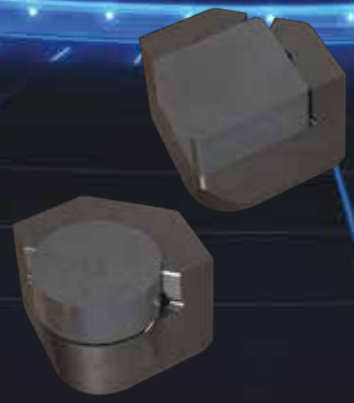

Two Types of Indexable Cartridges Fit the Same CER-M-TURN Holder.

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Further to this:

v_f=f×n (4)

and

v_f= fz×z×n (5)

Example: An ISCAR's BAYO-T-REAM high-speed reamer carrying exchangeable eight-flute solid carbide head RM-BN9-32.000-H7LB is applied to reaming a through hole Ø32H7 mm (Ø1.2500H7) in a steel workpiece, which has a hardness value of HRC 51…53. ISCAR, as the reamer manufacturer, recommends the following initial cutting data: v_c=40 m/min (131 sfm), fz=0.1 mm/tooth (.004 ipt). Find spindle speed and feed speed.

Metric system: From equations (2a) and (5)

n=1000×v_c/(π /d)= 1000×40/(π /32) =398 (rpm)

v_f=fz×z×n = 0.1×8×398=318.4 (mm/min)

US customary (imperial) system: From equations (2b) and (5)

n=12×v_c/(π /d)= 12×131/(π /1.25)=400 (rpm)

v_f=fz×z×n= 0.004×8×400=12.8 (ipt)

Depth of cut a_p, one more cutting data parameter, is the distance between machined and un-machined surfaces of a workpiece. This distance is measured towards a normal to the machined surface. Practically, this is the distance that the cutting edge extends into the workpiece material. Depth of cut is often referred to as abbreviature DOC.

If D and D1 are diameters of machined and un-machined surfaces accordingly, a_p in external longitudinal turning can be determined as below:

a_p= (D1-D)/2 (6a)

In boring (internal turning), the diameter of a machined hole greater than the diameter of an un-machined hole and the previous equation takes the following form:

a_p= (D-D1)/2 (6b)

In parting, the depth of cut is the same as the cutting-edge width. In grooving, the depth of cut corresponds to the width of the slot, performed by the grooving tool in one pass. If the groove width is equal to the width of a tool cutting edge and the groove is generated by one pass only, the depth of cut, is the cutting edge width.

In counter-boring and reaming, the depth of cut is calculated using the following equation:

a_p= (d-D1)/2 (6c)

d is the tool diameter

A typical milling cutter removes material with two of its surfaces at once, the periphery and the face. Therefore, in milling, the depth of cut relates to two process parameters that are measured in two different directions, such as axial depth of cut **a_p** that is measured along the mill axis and radial depth of cut **a_e**, which is measured radially when milling faces, shoulders and slots. The radial depth of cut is more known as width of cut – the width of a material layer that is removed by a mill in one pass.

Machining allowance, also known as machining stock or stock allowance, refers to the thickness of the material layer that should be removed during machining. There are two types of allowances, total allowance and process allowance. While the process allowance specifies the allowance for a particular machining process such as turning, milling, etc., the total allowance refers to all the material removed throughout the entire production of a part. The total allowance includes the allowances for all machining processes required in part manufacturing. Process allowance can be further divided into allowances for specific process operations, for example, rough turning, semi-finish turning and finish turning. These operations may be performed using a single tool or multiple different tools.

Machining allowance refers to the specific amount of material left for a cutting tool to remove in an application. Depending on the requirements for accuracy and surface finish, as well as possible tool limitations, like if the maximum depth of cut the tool can provide is less than the allowance, material removal can be performed with either a single tool pass or multiple passes. When defining cutting data for machining a workpiece made from a specific material on a particular machine, the following principles should be followed: In rough machining, the cutting depth is set to the largest possible value, preferably equal to the operation allowance or the greater part of it. The same approach applies to specifying the feed rate, it should be as high as possible within the constraints of existing technological limitations, such as machine power, cutting conditions, tool strength, etc.

In finish machining, the key factors for determining depths of cut and feeds are the required parameters of accuracy and surface finish, as well as the surface quality provided by the previous operation. Cutting speed depends on the characteristics of the tool and cutting material, cutting conditions, type of machining and prescribed tool life. The evolution of precise metal shaping techniques, such as precision investment casting, precision forging and 3D printing, are all capable of shaping a part very close to its final profile, significantly diminishing traditional chip-removal processes. As a result, the requirements for machining operations in engineering processes are changing. The role of productive and accurate cutting with small allowances at high speeds and feeds is expected to grow substantially, and metalworking industries will require a wider range of tools that are more precise and durable.

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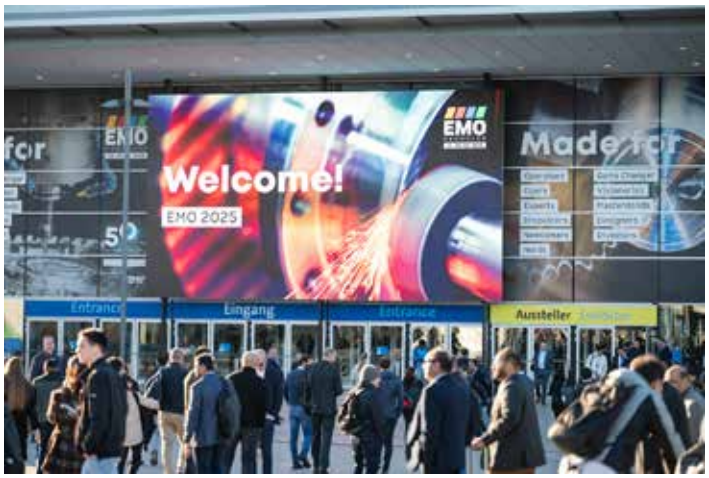
EMO 2025 IS PUSHING AI AND AUTOMATION FOR GREATER COMPETITIVENESS IN GLOBAL INDUSTRY

The whole world of metalworking – for five days, Hannover was the venue for EMO, the world's leading trade fair for production technology. Attracting a number of 80,000 trade visitors from all over the world, the exhibition grounds provided important innovative impulses for greater competitiveness in the industry. The main focus was above all on the topics of automation and artificial intelligence, which have once again found their way into industrial processes as drivers of production efficiency.



Technology, information, exchange, international networking, and cooperation – this is what EMO has embodied for 50 years. More than 1,600 exhibitors from 45 countries and a diverse supporting program presented a host of solutions for modernizing and upgrading production.

Carl Martin Welcker, General Commissioner of EMO 2025.

"There is a profusion of smart and impressive technical solutions. This EMO has convincingly demonstrated that," says Carl Martin Welcker, General Commissioner of EMO 2025. "For them to be effective, the booster engine of investment now really needs to fire. Many projects are in the pipeline after three years of investment restraint, but the uncertainty in the political sphere continues to put the brakes on investment," Welcker continues.

Confidence is already picking up abroad, particularly outside Europe. In the visitor survey, two thirds of visitors from there state that they intend to invest. In Germany, the figure is less than half. This is reflected by the current trend in foreign orders placed with the German machine tool industry, which increased by 6 percent in the first seven months of 2025 compared to the same period of the previous year. Demand from Germany fell by 22 percent over the same period. Nevertheless, EMO exhibitors are reporting sales. Norbert Teeuwen, Managing Director of Okuma Europe says: "Open Possibilities – that is precisely what connects EMO and Okuma. Our appearance at the exhibition was a complete success – among plenty of sales, we even sold three exhibition machines directly off the booth to our customers. For us, EMO is always a highlight. Thank you!"

Automation is a hot topic in the industry

Automation

The big topic in the industry is automation. This is driven by costs and a shortage of skilled workers. 50 percent of the visitors surveyed are interested in how they can use automation to boost their productivity. "Automation is everywhere here and is going to make a big difference", says Aaron Morrill, CNC mechanic from the USA. The importance of the use of robots is growing, as numerous robot manufacturers have impressively demonstrated at EMO. Ralf Winkelmann, CEO of Fanuc Europe, says: "We also see that robots will become increasingly important in the machine tool industry. Industrial robots will coexist with human operators. In the future, they will provide the most efficient solutions."

Interfaces to digitalization and sustainability

More than a third of the trade visitors want to learn about new aspects of digitalization and AI. "We see added volume in processes where all the possibilities for processing data from sensors are utilised. AI is useful for this and improves quality in the factory", says Jan Otoupakik, CEO 4dot Mechatronics, a startup from the Czech Republic. This was also reflected in the popularity of the P.O.P Talks, which were held daily at the central innovation stage, and highlighted numerous aspects of AI in production.

Automation, digitalization, and artificial intelligence ensure higher productivity, efficiency and quality. This also increases sustainability in production, for example by promoting efficiency in energy and materials. Sustainability is an important factor in research and among talented young people. "We are working on various solutions. One very important example is to reduce the energy consumption of production systems, for example by reducing the coolant flow so that only as much coolant as necessary is used, rather than as much as possible. That was the strategy in the past. This allows us to save up to 95 per cent of the pump energy, electrical energy and up to 60 per cent of the total energy consumption of the production system. So, this is a big step forward," says Professor Berend Denkena from the Leibniz University Hannover.

Top platform for international managers

Once again, EMO has proven to be a top platform for managers and buyers. In the visitor survey, more than half of the respondents stated that they were top or middle managers. They also have the authority to make procurement decisions.

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STUDER LOOKS BACK ON A SUCCESSFUL EMO 2025

Innovative Grinding Technology Impresses Trade Visitors

The world premiere of the S23 and ground-breaking grinding technologies underline the innovative strength of the Swiss cylindrical grinding specialist for the competitiveness of its customers.

"Fritz Studer AG looks back on a successful EMO 2025 in Hanover. We are delighted that our innovations in grinding technology attracted such great interest from international trade visitors," said CEO Sandro Bottazzo. The Swiss manufacturer of high-quality cylindrical grinding machines presented numerous innovations at the world's leading trade fair for manufacturing technology from September 22 to 26.

World premiere of the S23 and new generation of favoritCNC

A highlight was the world premiere of the new S23 universal cylindrical grinding machine. This versatile CNC machine offers state-of-the-art grinding technology for maximum precision and reliability in a space-saving design. Thanks to its high-quality features, the S23 perfectly complements the portfolio between the entry-level and premium segments. It impresses with features such as the modern CORE hardware and software architecture, an automatic B-axis with 1° Hirth gearing for up to three grinding tools, and a Granitan® machine bed with outstanding thermal and vibration properties.

The new generation of the favoritCNC, which STUDER has equipped with modern capabilities and optimizations, also garnered significant attention. The popular entry-level machine now features an updated CNC control (FANUC 0i-TFP), an automatic operator door and loader interface for automation solutions, a resource-saving belt-driven spindle system, and a machine frame with a larger X-guideway spacing for even greater stability. Furthermore, the new Conventional Mode facilitates the transition between manual and CNC grinding.

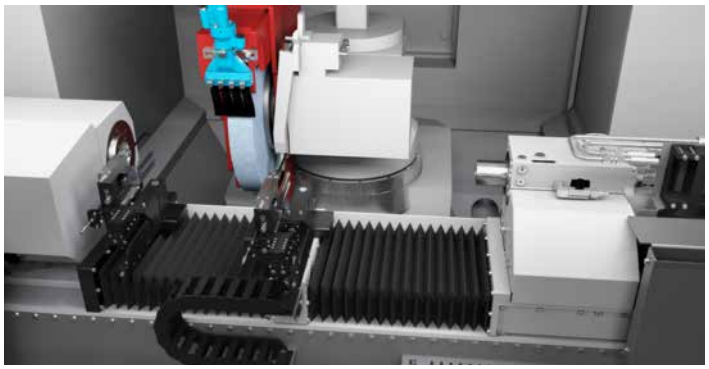
Universal cylindrical grinding machine S23.

Innovative axis system and WireDress® for internal cylindrical grinding

On the S31 universal cylindrical grinding machine for small to large workpieces, STUDER demonstrated an innovative axis system that sets new standards in automated precision cylindrical grinding. The long W-axis enables automatic adjustment of the tailstock position to different workpiece lengths, while the active R-axis, equipped with an in-process measuring system, can scan complex geometries on the workpiece. A special feature of the system is the direct measurement of the clamping force. This ensures precisely reproducible clamping conditions for workpieces. The clamping force is also displayed on the control screen for the machine operator.

A further leap in innovation was presented with the introduction of the WireDress® non-contact dressing system for internal cylindrical grinding. This wire EDM-based technology opens up new geometric manufacturing possibilities with diamond and CBN grinding wheels featuring a sintered metal bond. This is made possible by a new internal grinding spindle capable of transmitting current at full grinding speed.

"At EMO 2025, STUDER was able to demonstrate how we will continue to contribute to our customers' success in the future. A smart combination of reliable and innovative grinding technology offers decisive advantages for competitiveness," summarized Pascal Schärer, Sales Manager for Central Europe.



The new axis system for the S33 and S31 enables automatic adjustment to different workpiece lengths.

☞ *Cont. from page 26*

Dr. Markus Heering, Executive Director of the EMO organizer, the VDW.

Overall, 94 percent of visitors felt their objectives for the visit had been achieved. 98 percent rated EMO between satisfactory and very good. This is also reflected in the verdict of the exhibitors. Irene Bader, Board Member at the German-Japanese company DMG Mori, puts it in a nutshell: "What we presented at EMO in 2025 is a glimpse into the future of production. Our customers' enthusiasm and their valuable feedback have once again shown us how important face-to-face exchange is for real innovation. For five days, EMO was a global meeting place for ideas, partnerships, and new perspectives." And German Wankmiller, Chairman of the Board of Management of Grob-Werke, adds: "Overall, we are satisfied with how this year's EMO went, and we've been positively surprised considering the currently challenging market situation. The number of visitors and the quality of the discussions have also been consistently positive and have given us important ideas to follow up over the coming months."

"Once again, it has proven possible to attract international market leaders in metalworking to EMO and address the new topics in industrial production," concludes Dr. Markus Heering, Executive Director of the EMO organizer, the VDW. "As a result, it has consolidated its position as the world's leading trade fair and barometer of trends," he summarizes.

EMO 2027 will take place from October 4 to 8 in Milan, Italy.

For more information, please contact Retecon – Tel: 011 976 8600.

S33

UNIVERSAL CYLINDRICAL GRINDING MACHINE

Universal and flexible. These are the features of the new S33, the CNC universal cylindrical grinding machine from STUDER. It can grind small to large workpieces in single batch, small or large series and is available with centre distances of 400 mm / 650 mm / 1000 mm / 1600 mm and a centre height of 175 mm. The changeover from grinding between centers to live spindle grinding takes place in record time. Complex workpieces are easily ground in just one clamping.

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STUDER

CUTRONIC NOW AUTHORIZED BYSTRONIC AND DNE DEALER IN SOUTH AFRICA

Bystronic South Africa AG has restructured from a subsidiary to a Dealer Agency and is now proudly continuing under new South African ownership as Cutronic (Pty) Ltd, effective 1 October 2025.

For many, the leadership of Cutronic (Pty) Ltd will be very familiar. Gareth Jackson and Andrew Poole, who played pivotal roles in establishing and growing the Bystronic brand in South Africa, have returned, this time alongside Richard Davidson to guide the business into its next chapter.

Both, Gareth and Andrew maintained strong ties with Bystronic after the 2020 acquisition. Today, together with Richard, they proudly lead Cutronic as the exclusive Dealer for Bystronic and DNE in Southern Africa, united by a shared commitment to service excellence, innovation and advancing the manufacturing industry. All three directors share a deep passion for the brand and an unwavering dedication to ensuring long-term success and collaboration with suppliers and simply put, the old boys are back and stronger than ever!

Andrew Poole – Director

Andrew Poole

With over 30 years of industry experience, Andrew Poole began his career as a founding member of First Cut, a leading supplier of cutting solutions across various industries, including the steel sector. He went on to co-run the Bystronic agency in South Africa with Gareth Jackson until 2020, when Bystronic acquired the agency and opened a subsidiary in the country. Today, Andrew serves as Managing Director at Alexander & Poole and also drives innovation through Tekenso, a cloud-based platform designed to give manufacturing companies complete control and visibility of their processes. An entrepreneur at heart, Andrew's passion lies in creating environments that foster innovation, growth, and cutting-edge solutions.

Gareth Jackson – Director

Gareth Jackson

With more than 29 years of expertise in the cut-to-size and steel fabrication industry, Gareth Jackson has built his career around a deep passion for the steel sector. Starting at Laser Sprint, he gained valuable experience as a service provider and center operator, later expanding his knowledge across the mining, military, water, and structural sectors. Gareth co-led the Bystronic agency alongside Andrew Poole until 2020, after which he continued with Bystronic's South African subsidiary until 2022. As a leader and mentor at Jewll Industries, market leaders in custom-designed flameproof equipment, Gareth has combined family-business values with the strategic expertise developed in the corporate world.

Richard Davidson – Director

Richard Davidson

Richard Davidson is a Chartered Accountant (SA) with over three decades of business leadership experience. His career began at Deloitte & Touche, where he spent six years, including three as an Audit Manager. He went on to spend 14 years in the logistics sector, ultimately serving as Group Financial Director of a R2 billion fuel logistics group. In 2011, he joined South Africa's exclusive Nespresso agent, driving growth from a single store to 15 retail outlets alongside a strong e-commerce presence, before successfully selling the business back to Nestlé in 2023. Richard is now active in the sheet metal industry, with additional interests in software and the Bystronic Agency in South Africa. He specialises in building financially stable businesses, implementing growth strategies, and leading IT and operational transformations.

Existing supplier relationships will continue uninterrupted, with the same dedicated team of individuals who have transferred from Bystronic AG to Cutronic, ensuring a seamless business transition. Chris Burnett, as the Global Head of the Dealer Network, will continue to provide oversight and support.

For more information, please contact Cutronic – Tel: 010 410 0200.

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