numinformation

JOURNAL FOR CNC-TOTAL SOLUTIONS

num CNC Solutions

No. 66 – August 2025

Editorial
Massimiliano Menegotto
CEO NUM Group

Dear readers

At NUM, we believe that innovation is not a one-time achievement – it's a continuous journey we take together with our customers. Each success story in this edition of NUMinformation #66 is a clear reflection of this shared path forward.

From pipe cutting automation in Texas with Lone Star Cutting Solutions and PypeServer, to cutting-edge grinding technologies with Lih-Jaan (Taiwan) and Hotman (China), to specialized machinery from BAIER Prägetechnik (Germany), wooden beam processing solutions from Krüsi Maschinenbau (Switzerland), and a state-of-the-art rail welding and grinding facility by Provide Solution (Italy) – each partnership demonstrates how an advanced and capable CNC system can transform bold ideas into powerful realities. These collaborations are more than just projects; they are testaments to what's possible when deep expertise meets and work together.

As Massimiliano Menegotto, CEO of NUM Group, recently said: "Our mission is to be more than a technology provider. We aim to be a trusted partner who enables innovation through custom-tailored CNC solutions – always with a personal touch."

Our focus remains on developing CNC platforms that offer maximum flexibility, high performance, and intuitive operation – empowering machine builders to turn ideas into reality with faster time-to-market. And once the project is complete, NUM continues to be a trusted partner, delivering exceptional product and service quality.

We also look forward to connecting with many of you in person at upcoming international trade fairs: FABTECH in Chicago, Marmomac in Verona, DMP in Shenzhen, and GrindingHub in Stuttgart. These events offer a valuable opportunity to showcase our latest technologies – and, more importantly, to engage directly with the people who inspire our work every day: our customers.

We hope this issue gives you fresh insights into what's possible with NUM – and perhaps even ideas for your next great innovation.

Kind regards,

Massimiliano Menegotto
CEO NUM Group

Sustainability in Focus – A Committed Step Toward a Greener Future

At NUM, sustainability is not a trend – it is an integral part of our corporate responsibility. Through focused investments and forward-looking initiatives, we are actively shaping sustainable progress – technologically, environmentally, and socially.

A current example is our German branch in Holzmaden, which recently commissioned a new photovoltaic system. Covering 150 m² and generating 30 kWp of power, the installation already supplies over 50% of the site's annual energy needs – a figure expected to increase with planned optimizations to the heat pump system and potential battery storage. In just the first week, the system produced over 1,000 kWh – meeting the majority of local demand and even feeding surplus energy into the public grid. Further photovoltaic installations can also be found at our locations in Switzerland and Italy.

This measure highlights our ongoing commitment to ESG (Environmental, Social, Governance). The current esg2go rating confirms our responsible approach – and motivates us to continue on this path with determination.

Our customers benefit directly: through energy-efficient solutions, future-ready technologies, and a collaborative approach built on long-term responsibility.

Photovoltaic system on the company building in Teufen

Photovoltaic system on the company building in Holzmaden

NUM Event Calendar 2025/2026

FABTECH 2025
September 8–11, Chicago, USA
Hall B Booth 12015

Marmomac 2025
September 23–26, Verona, Italy
Hall 2 Booth D7

DMP 2025
November 5–8, Shenzhen, China
Hall 8 Booth 8B05

GrindingHub 2026
May 5–8, Stuttgart, Germany

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NUMgrind – Surface Grinding Pack GS1

Next-Generation Thread Grinding HMI

NUMgrind – Surface Grinding Pack GS1

Shop Floor Programming Solution for Surface Grinding: NUM has extensive experience in grinding applications and is one of the world's leading suppliers of CNC solutions for tool grinding. NUM also supports external and internal cylindrical grinding, including non-circular grinding, surface grinding as well as centerless cylindrical grinding, with CNC systems specially tailored to the respective application. Each application solution provides corresponding cycles and a matching and easy-to-use HMI.

NUMgrind for Surface Grinding (Surface Grinding Pack 1) covers all aspects of the surface cylindrical grinding process. It offers a complete "off the shelf" solution, with embedded grinding and dressing cycles governed by a user-friendly menu-driven data entry system that includes 3D simulation and wizard-guided setup. In short, NUMgrind not only saves OEMs years of development time, but also significantly reduces operators' training time.

NUMgrind HMI Surface Grinding

NUMgrind HMI

The Flexium CAM-based programming process is extremely user-friendly. Entry screens provide the machine operator with a comprehensive graphical programming approach that depicts the grinding wheel, workpiece, and associated setup data in a clear and concise manner. Operators do not have to use ISO or G-code programming; they simply fill in the data fields presented by the program. After completion of the data entry session, the grinding program is automatically generated, stored, and is then ready for execution.

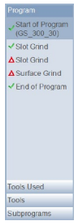
The highly intuitive input fields, which support the operator with images, often also have a teach position function. This allows the operator to easily transfer the current axis position directly into the input field of the workpiece program.

This is an effective time-saving option for recording the relevant grinding positions directly on the workpiece, especially when surface grinding.

The architecture of the NUMgrind HMI is ergonomic and offers a comfortable programming experience with a very instinctive interface:

In picture 1 is the "command tree" with all available functions (general definitions, tool selection, cycles, etc.). The user interface can work with mouse, keyboard and touch screen.

1



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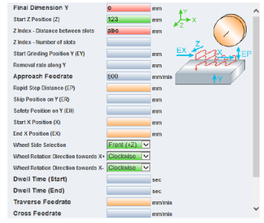


3

The frame 2 shows the "Program sequence". The selected commands are inserted into it in the order that they should be performed. Whether a command is complete and plausible is indicated by a flag in green or red next to each command.

In picture 3 we have the input page with graphic support. Orange fields are mandatory fields, blue fields are optional entries. If the fields are green or red, the entry is accepted or not accepted.

The grinding cycles are designed for a 3-axis (X/Y/Z) grinding machine. The packages include the following features:

Grinding Cycles:
- Slot Grinding Cycle (with and without oscillation)
- Surface Grinding Cycle

Auxiliary Grinding Functions:
- Wheel Surface Speed Calculation
- Manual Measurement
- Emergency Retract Sequences
- Fixed 2 Diamond or Profile Dressing Roller Wheel Dressing
- Fixed 2 Diamond Dresser Wheel Shaping
- Part and Dresser Setup Routines
- Wheel Data Management (Eight Stored Setups)
- Semi-Automatic Mode (Automatic oscillation along X and if needed Z axis, manual operation on the Y axis)

Wheels:
- Straight Wheels
- Special Profile Wheels (by Profile Dressing Roller or 2 Diamond Dresser)

More details on NUMgrind:
num.com/complete-solutions/numgrind

Next-Generation Thread Grinding HMI

NUM Taiwan is developing a new Thread Grinding Human-Machine Interface (HMI) tailored for intuitive, precise, and efficient thread grinding operations. Precision thread grinding is a critical process for manufacturing high-quality threaded components like ball screws, worm shafts, and specialty fasteners. To simplify and enhance this process, NUM Taiwan is developing a dedicated Thread Grinding Human-Machine Interface (HMI) as part of its CNC platform. This specialized HMI is being built with a combination of C# programming, macro routines, and PLC integration to provide an intuitive yet powerful interface for thread grinding operations. The goal is to enable operators to program and grind threads efficiently with conversational inputs and guided setup, rather than manual G-coding. In this article, we review the current progress of the NUM Taiwan Thread Grinding HMI, the features it will offer (and those planned), and the updated development timeline, all presented in a polished format suitable for our customers.

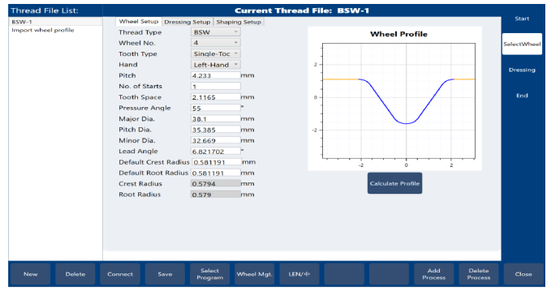
Current Focus: Single External Thread Grinding
The initial development focus for the NUM Taiwan Thread Grinding HMI is on single-start external thread grinding. This means the first release will handle threads that have a single helical groove (single-start) on the outside of a workpiece. By concentrating on external threads first, the development team can ensure the core functionality is solid for the most common use cases (such as grinding threads on shafts, screws, and bolts). The HMI provides straightforward input screens where the operator can enter thread parameters (like diameter, pitch, length, etc.), and the system will generate the necessary grinding and dressing cycles behind the scenes. This conversational approach is akin to NUM's existing NUMgrind software, which uses intuitive fill-in-the-blank dialogs so shop-floor personnel can quickly create G-code programs without extensive CAM knowledge. The new thread grinding HMI follows this philosophy, guiding the user through single thread setups step by step.

Extensive Thread Profile Support
A major highlight of the new HMI is its broad support for different thread shape standards. NUM Taiwan recognizes that customers need to grind a wide variety of thread forms used across industries and regions. The HMI will come with built-in profile definitions for many common fixed thread shapes, including:

- International metric thread system
- American standard thread
- Whitworth thread
- Sharp V thread
- Trapezoidal thread
- Ball screw (Customers have to provide point file)

Beyond this list of standard shapes, NUM Taiwan is also planning a custom thread shape feature for a future release. This would be the ability to import a profile from a CAD drawing – for example, loading a DXF file that contains the cross-sectional outline of a custom thread form. With DXF import capability, users could grind non-standard or proprietary thread profiles by simply drawing the desired shape and letting the HMI convert it into a grind program. This opens the door to virtually any thread form imaginable, ensuring that even unique or specialized threads (for instance, trapezoid variants, special sealing threads, or forms used in aerospace) can be produced. The concept of importing DXF files for custom profiles is already used in some CNC grinding software, and NUM Taiwan will bring a similar convenience to thread grinding. This forward-looking feature underscores NUM Taiwans's commitment to versatility – giving customers both a rich library of standard threads and the freedom to define their own when needed.

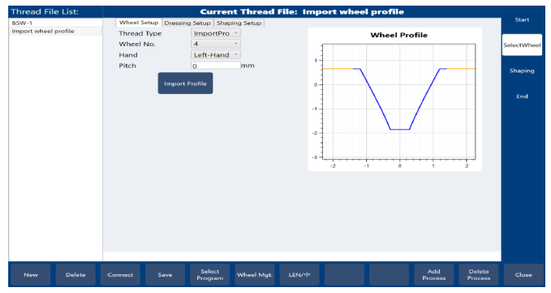
Accurate Thread Profiles Through Smart Dressing Compensation
In thread grinding, the grinding wheel must be precisely dressed to match the thread profile. Challenges arise when the wheel or dresser is rotated at an angle (A-axis rotation), which can distort the profile if not compensated. The new NUM Taiwan HMI solves this with automated dressing profile conversion, adjusting the wheel shape based on the tilt angle to ensure the final thread matches the intended geometry. This compensation is especially important for axis-parallel grinding or machines with limited swivel capability. By calculating these adjustments automatically, the HMI eliminates trial-and-error and ensures high precision – even for complex or internal threads.



Whitworth thread page

User-Friendly Interface & Teach-In Setup
NUM Taiwan is designing its Thread Grinding HMI with simplicity and operator comfort in mind. The interface features a teach-in mode, allowing users to manually guide the machine to key positions – such as thread start, axial zero, or dresser location – and easily save them. This helps streamline setup and reduces the chance of errors, even for less experienced operators. The HMI also includes intuitive menus, familiar terminology, and graphical views to make programming straightforward. Everything is tailored specifically to thread grinding – ensuring clarity, efficiency, and ease of use.

Looking Ahead
Once released, the NUM HMI will offer a powerful, user-friendly tool for accurate, efficient thread grinding. Customers can expect reduced setup times, improved thread quality, and support for a wide range of profiles – from metric and trapezoidal to ball screw threads. With future updates including multi-start and internal thread support, the platform is built to grow with user needs.



Import DXF page

From Timber Joints to Science Awards: Swiss Projects That Bring CNC to Life

Precision. Flexibility. Quality. These aren't just the core values of Krüsi Maschinenbau AG – they also define a groundbreaking partnership with NUM AG. Together, these two Swiss companies have developed a CNC woodworking center that's setting new global benchmarks: the MC-15. It's a perfect blend of cutting-edge control technology and decades of timber construction expertise – fueling projects that inspire.

Two Companies, One Goal: Maximum Performance in Timber Construction
The collaboration between Krüsi Maschinenbau AG and NUM AG goes far beyond a typical customer-supplier relationship. It's a true partnership – two equals united by a shared goal: developing innovative solutions for modern timber construction.

Founded in 1961, Krüsi Maschinenbau AG has spent over 60 years growing from a mechanical workshop into a globally respected manufacturer of woodworking machinery. Today, more than 3,200 Krüsi systems are in operation across 38 countries – from standard framing systems to highly specialized custom machines for free-form timber structures.

NUM's Flexium+ CNC system delivers the ideal control solution: modular, powerful, and fully adaptable to meet the MC-15's specific demands. Joint development began in 2015, and the result – a revolutionary machine for timber construction – will celebrate its 10th anniversary in 2025.

"All these years, it's been a strong collaboration. NUM's close proximity allowed them to support us quickly and continually improve and optimize the machine," says Pascal Stehli, Project Manager at Krüsi Maschinenbau AG.

The MC-15: Built for Precision and Versatility
What sets the MC-15 apart is its speed and adaptability. Designed for automated processing of timber beams and components in a range of sizes, the machine features a modular design focused on maximum flexibility. Key highlights include:

- Up to 35 controlled axes/spindles, enabling even 5-axis free-form machining
- One or two cross beams with up to six freely selectable processing units
- Rigid, precise machining units for long-term accuracy
- Mechanical and electrical axis layouts designed for high speeds, agility, and component longevity
- Material feed capacity from 55 x 20 mm to 1300 x 300 mm – ideal for everything from standard framing and roof trusses to complex free-form structures
- A 4-channel control system for fast, seamless switching between all six processing units

The MC-15 can mill, drill, saw, groove, rebate, and profile – all sides, with extreme precision. Its modular architecture allows full customization, from processing unit configurations to lead-in/out section lengths and specialized software features.

NUM Flexium+ 68: Intelligent, Seamless Control
Control technology is key to the MC-15's performance. The NUM Flexium+ 68 CNC system not only delivers outstanding power and precision – it also includes custom-developed user interfaces and visualizations tailored to Krüsi and its customers.

Thanks to its open architecture, the system integrates seamlessly and offers:

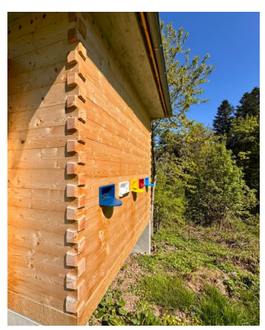
- Intuitive touchscreen operation
- Visualization of all machining steps
- Fully customizable user interface
- Easy integration with existing software environments
- Custom CNC functions for specialized tasks

NUM supplied all core components – from the CNC controller to NUMDrive X drives, single-cable motors, and safety systems – ensuring 24/7 reliability and a fully coordinated platform.

"The Flexium+ 68 convinced us with its openness and adaptability. Together with NUM, we created a control system perfectly tailored to our needs – and our customers'," adds Stehli.

Appenzell Joinery in Action – Two Outstanding Student Projects
The MC-15's capabilities are showcased through two standout projects in traditional Appenzell joinery – where technology, sustainability, and education intersect.

The Beehouse – A Living Biology Classroom
How about a beehouse as a biology education center? At the Cantonal School of Trogen in Appenzell Ausserrhoden, that idea became a reality. The existing beehive station was outdated, and the solution – a new structure built in the Appenzell timber style – was designed by students, supported by the alumni association, and constructed with help from the Vocational Training Center Herisau, Nägeli Carpentry, and Krüsi Maschinenbau AG.

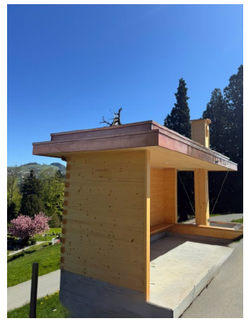


Appenzell-Style Joinery Featured Throughout the Apiary – Inside and Out

Krüsi went the extra mile. The student concept of producing Appenzell-style joints on a CNC machine – without specialized tools – was refined and optimized by Krüsi to allow production without manual rework. Machining sequences and strategies for the corner joint were clearly defined for efficient manufacturing.

The joints were produced on the MC-15 at Nägeli Carpentry, located just a few miles from Trogen. Now in use with its third Krüsi system, the company helped bring the project to life – an inspiring blend of craftsmanship, education, and technology. Today, three beehives reside in the structure, which now serves as both a classroom and a symbol of ecological stewardship.

The Self-Sufficient Bus Stop – A Biodiversity Champion
The "Biodive" project – conceived by students at the Cantonal School of Trogen – won the 2021 Science on the Move competition and received a special prize for best performance. Their concept: a self-sufficient bus stop powered by solar panels, collecting rainwater, providing wildlife habitats, and sharing educational content via QR codes. A prototype is complete, with the official launch set for May 2025.



Self-sufficient bus stop in Trogen

As with the beehouse, the timber joinery templates were provided by Krüsi. The connection is no coincidence – the two structures sit at opposite ends of the school campus, forming an architectural and thematic link.

Sustainability at Every Level – Made in Appenzell
Few people realize just how deeply Krüsi commits to sustainability. It doesn't end with the product – it's built into the entire business model. Many Krüsi machines have been running for over 40 years. Spare parts, both mechanical and electronic, remain available. Even older control systems are updated through retrofit projects.

"We're not a corporation pushing a new model every five years. We think long-term – and we think with our customers," says Urs Iseli, CEO of Krüsi Maschinenbau AG. That philosophy runs throughout the company – from inventory management to lifelong customer support.

Technology Meets Purpose
Whether it's the beehouse or the self-sufficient bus stop, these projects demonstrate what's possible when expertise, innovation, and collaboration come together. The results are more than products – they're meaningful contributions to education, sustainability, and craftsmanship.

One thing is clear: as demands in timber construction rise, leaders will need partners they can trust.

Dr. Elisabeth Steger Vogt, Rector of Trogen Cantonal School with Urs Iseli, CEO of Krüsi Maschinenbau AG

From left to right: Urs Iseli, CEO Krüsi Maschinenbau AG, Daniel Ursic, Area Sales Manager NUM AG and Pascal Stehli, Project Manager Krüsi Maschinenbau AG

MC-15

Machined workpiece for the construction of Appenzell-Style Joinery

Where Technology Meets Precision: BAIER and NUM Shape the Future of Embossing

How does a traditional company stay at the forefront of innovation? By challenging the status quo, exploring new ground – and partnering with experts along the way. That's exactly what BAIER has done. In collaboration with NUM, BAIER successfully brought together two worlds: traditional hot stamping technology and modern CNC control. The result is a high-precision, future-ready system for advanced functional foil bonding – a true showcase for the next generation of mechanical engineering.

The Future of Embossing Technology

For BAIER, the future is clear: greater precision, increased flexibility, and full digital integration. In a groundbreaking customer project, the long-established company took a major leap forward. Together with NUM, BAIER developed a highly sophisticated system that, for the first time, merges CNC control with embossing technology into one platform. The outcome? A high-performance solution for advanced functional foil bonding (FFB) developed for Leonhard KURZ Stiftung & Co. KG, setting a new benchmark for the industry.

Hot stamping machine with a Flexium+ 68 control system. Two slide-in tables incl. 8 cameras for quality monitoring

Technology You Can See – but Not Feel

Modern user interfaces are about more than just looks. Whether it's the dashboard of an electric vehicle or the control panel of a washing machine, touch displays must not only be intuitive – they must be flawlessly finished. That's where FFB technology comes in: combining functional films with technical components requires an extraordinary level of precision and cleanliness – comparable to the standards of medical technology.

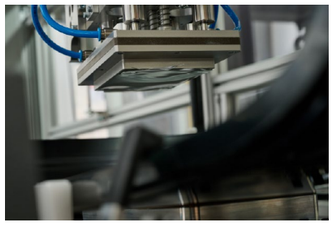
When tasked with developing a new FFB system for a leading heat pump manufacturer, BAIER quickly realized that the complexity of a four-axis system had outgrown the capabilities of conventional controls. What was needed was a powerful CNC solution – a first for BAIER.

Two Specialists, One Vision

In NUM, BAIER found the ideal partner. Beyond the convenience of being nearby, NUM's deep expertise in custom machine tool applications made the decision an easy one. NUM's open CNC platform allows for application-specific customization all the way down to the control core – a crucial advantage for creating highly specialized machines.

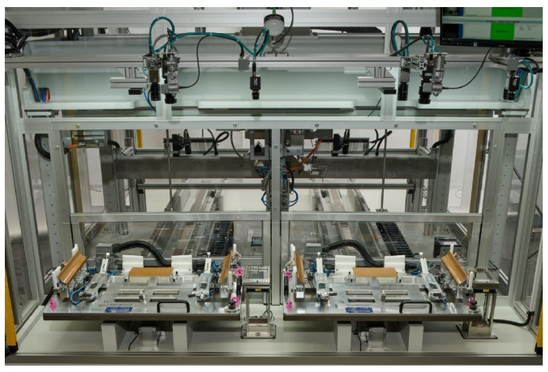
Collaboration Across Disciplines, Focused on the Future

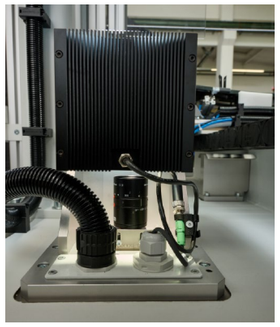
Despite decades of combined experience – NUM in CNC technology and BAIER in embossing – the project pushed both companies into new territory. Thanks to a close, interdisciplinary approach, the teams were able to execute the project with precision, structure, and flexibility.



Pinning

All project requirements were jointly defined during a kickoff meeting in March 2023. Based on a comprehensive specification sheet, NUM created a functional design and took responsibility for sourcing and designing all electrical components – from CNC drives and motors to visualization systems and control panels. Meanwhile, BAIER handled the mechanical engineering and assembly.





Camera system for quality control

After successful software testing, NUM's application engineers programmed the PLC system and commissioned the controls. An intuitive HMI interface was also developed specifically for this system to ensure easy operation.

One critical success factor: the project was run with an agile approach. New requirements could be integrated at any time, and direct communication kept the process flexible and efficient.

Simultaneous preparation and embossing is possible thanks to two embossing tables. The holders on the embossing tables can also be swapped so that components from the same product range can be processed in different sizes.

Built for Today – and Tomorrow

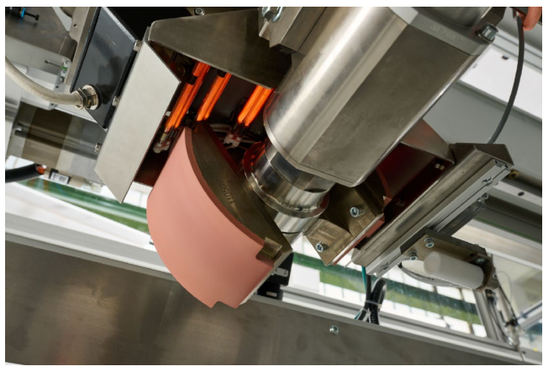
Commissioning was completed in February 2024, and final acceptance testing by the end customer wrapped up successfully in June. The system was fully delivered and integrated at the customer's site by November. Today, it's proving itself with outstanding performance: it's stable, user-friendly, and low maintenance. Minor system adjustments have been handled independently by the customer, thanks to targeted training provided by NUM and ongoing support from BAIER.

For BAIER, this project marked more than just a milestone – it opened the door to new opportunities. A second, identical machine is already in planning, and additional CNC-driven projects are on the horizon, including ventures into new areas like digital printing.

A Partnership with a Future

"This was real teamwork – collaborative, solution-oriented, and efficient," says Thea Huttenlauch, Managing Director at BAIER. Marc Riedl, Area Sales Manager at NUM, agrees: "Working with BAIER really showed how versatile our CNC system is. We're excited for many more joint projects to come."

What remains is a powerful message: when experience meets innovation, the technologies of the future are born.



Embossing wheel

Camera system for quality control

Pinning station

NUM AG Partners with Lone Star Cutting Solutions and PypeServer to Enhance Magnum Pipe Cutting Machine

NUM AG, a leading provider of advanced CNC control solutions, is proud to announce its latest collaboration with Lone Star Cutting Solutions, a premier manufacturer of cutting machines, to enhance the capabilities of the Magnum pipe cutting machine. This partnership, supported by software from PypeServer, underscores the companies' commitment to innovation and precision in the field of industrial cutting.

About Lone Star Cutting Solutions
Based in the heart of Texas, Lone Star Cutting Solutions has established itself as a leader in the manufacturing of high-performance cutting machines. The company is renowned for its robust and reliable machinery, tailored to meet the needs of various industries, including construction, oil and gas, and manufacturing. The six-axis Magnum pipe cutting machine, one of Lone Star's flagship products, exemplifies the company's dedication to delivering state-of-the-art solutions that combine durability with precision.

Lone Star Magnum

NUM's Cutting-Edge CNC Controls
NUM brings its industry-leading expertise in CNC control systems to the Magnum pipe cutting machine, providing advanced controls that significantly enhance its performance. Central to this collaboration is the integration of NUM's sophisticated height control interface for cutting systems, ensuring precise and consistent cutting depths. This feature is particularly critical for maintaining the high-quality standards that Lone Star Cutting Solutions is known for, especially when working with complex pipe geometries and cutting angles.

In addition to height control, the Magnum machine now benefits from NUM's advanced RTCP (Rotation Tool Center Point) function, which is specifically designed for multi-axis machining applications. The RTCP function allows for precise control of the tool tip in relation to the workpiece, ensuring that the desired bevel angle is maintained consistently, even when the orientation of the A/B bevel head changes. This is crucial for applications requiring high-precision beveling, such as those found in pipe cutting, where the accuracy of the cut can have significant implications for subsequent welding processes.

The RTCP function, combined with NUM's intuitive CNC interface, empowers operators to achieve complex bevel cuts with ease and precision, minimizing manual adjustments and reducing the risk of errors.

Machine in operation

Moreover, the Magnum pipe cutting machine now benefits from NUM's capability to connect seamlessly with the machine's plasma power module directly over EtherCAT. This advanced connectivity not only simplifies integration but also ensures real-time communication and control, leading to improved efficiency and reduced downtime due to the enhanced diagnostics it provides. The EtherCAT interface allows for high-speed, deterministic communication, which is essential to achieve the precise cut process control required in demanding cutting applications. NUM's data transfer over EtherCAT is compatible with a variety of plasma cutting systems, giving the OEM flexibility to quickly adapt to any customer's preferred power source.

Seamless Integration with PypeServer for Enhanced Cutting Cycle Programming
To further elevate the capabilities of the Magnum pipe cutting machine, NUM and Lone Star worked closely with PypeServer, the leader in pipe profiling software. PypeServer can bring in pipe designs from a wide variety of software, including Autodesk Revit, AutoCAD (Plant 3D, CADmep, Advance Steel), Inventor, SDS2, Tekla, and any software package that can export STEP, PCF, PCD, CSV, FIX, and other industry standard formats. PypeServer also includes its own easy to use part designer, a powerful nesting feature that saves time and material, and flexible label printing capabilities for parts and drops. As parts are cut, PypeServer automatically updates their status to the PypeServer Cloud service that's included with the software.

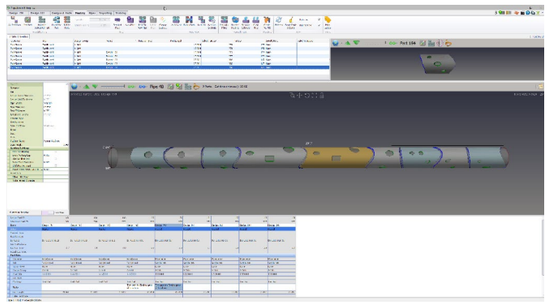
In conjunction with NUM's Flexium 3D simulation software, PypeServer provides an intuitive and efficient workflow that optimizes material usage, reduces labor, and consistently achieves high-quality cuts, making the Magnum pipe cutting machine an even more valuable asset in commercial construction and industrial applications.

HMI

Driving Innovation Together
The partnership between NUM, Lone Star Cutting Solutions, and PypeServer is a testament to the power of collaboration in driving technological advancements. By combining NUM's expertise in CNC controls with PypeServer's advanced pipe cutting software and Lone Star's commitment to building reliable, high-performance cutting machines, the enhanced Magnum pipe cutting machine offers users unprecedented levels of precision, efficiency, and ease-of-use.

"We are thrilled to partner with Lone Star Cutting Solutions and PypeServer on this project," said Steven Schilling, Managing Director of NUM US. "Our CNC control systems are designed to push the boundaries of what's possible in industrial cutting, and the integration with the Magnum machine is a perfect example of how advanced technology can be leveraged to deliver superior performance."

Lone Star Cutting Solutions shares this enthusiasm, with David Elmore, Sales and Growth at Lone Star, stating, "NUM's controls have taken the Magnum pipe cutting machine to the next level. The seamless integration with the power module, RTCP bevel control and the advanced height control interface are game-changers for our customers, allowing them to achieve precision cuts with greater efficiency."



PypeServer

Customer Spotlight: Ainsworth Inc. on the Lone Star Magnum, PypeServer, and NUM Control System
Ainsworth Inc., a major player in pipe fabrication, recently implemented the Lone Star Magnum pipe cutting machine in combination with NUM CNC controls and PypeServer software – and the results have been impressive.

Ainsworth took delivery of the Magnum in late 2024 and had it up and running by January 2025. Even though the team had no prior CNC programming experience, the system quickly became an integral part of their workflow. Thanks to clear support from Lone Star, NUM, and PypeServer, initial setup challenges were addressed efficiently – with on-site tech assistance extended at no extra cost.

"We didn't have any previous experience with CNC programming," said Steve Whitehaus, Fab Shop Manager at Ainsworth. "But with PypeServer, we're able to easily create designs and send NC programs to the NUM controller. Our CAD department sends drawings directly to the PypeServer computer, which cuts our programming time significantly."

David Elmore, Sales and Growth at Lone Star, stating, "NUM's controls have taken the Magnum pipe cutting machine to the next level. The seamless integration with the power module, RTCP bevel control and the advanced height control interface are game-changers for our customers, allowing them to achieve precision cuts with greater efficiency."

Efficiency and Accuracy in Daily Use
The Ainsworth team uses the Magnum to cut carbon steel pipe from 3" Schedule 40 to 8" Schedule 80. Cuts range from straight ends for Victaulic grooves to 37.5° bevels for butt welds. They plan to expand to stainless-steel pipe cutting soon.

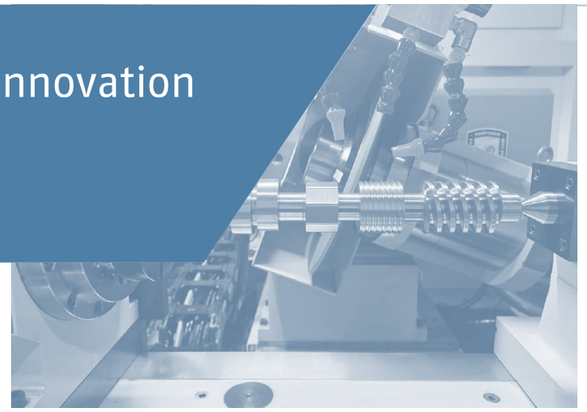
The system's auto-nesting feature reduces material waste by optimizing cuts on each pipe. Combined with the precision and reliability of NUM controls, and the design flexibility of PypeServer, the trio of technologies streamlines operations.

"The speed and accuracy of the system is a huge time saver for our workflow. The Lone Star Magnum, PypeServer, and NUM controls work well with each other. All three companies are very responsive in resolving issues," said Steve Whitehaus, Fab Shop Manager at Ainsworth.

Looking Ahead
As NUM, PypeServer, and Lone Star Cutting Solutions continue to explore new avenues of innovation, their partnership is expected to lead to further advancements in the field of industrial cutting technology. All three companies are committed to providing their customers with cutting-edge solutions that not only meet but exceed their expectations.

Lone Star Magnum

Lih-Jaan and NUM: Accelerating Innovation in Worm Thread Grinding



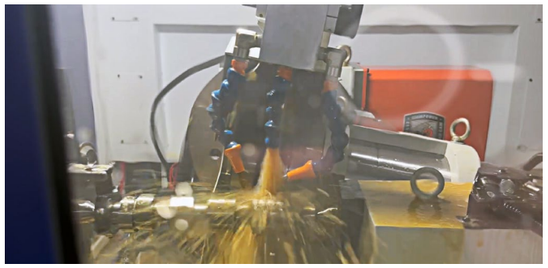
Since its founding in 1984, Lih-Jaan has earned a strong reputation for precision engineering, particularly in the field of thread and cylindrical grinding machines. With decades of experience and a commitment to quality, the company became a trusted name in its industry. But as manufacturing demands evolved and the complexity of applications increased, Lih-Jaan set its sights on a new challenge: worm thread grinding. This highly specialized process requires not only technical precision but also a deep understanding of machine control and customization. To take this next step, Lih-Jaan needed a partner with the expertise and flexibility to support such an ambitious move. That's when they turned to NUM – a company known for its advanced CNC solutions and collaborative approach to innovation.

A New Challenge: Worm Thread Grinding
For over 40 years, Taiwan-based Lih-Jaan has been known for building solid, reliable grinding machines – especially for thread and cylindrical applications. Their reputation for precision and consistency has made them a go-to partner across a wide range of industries. But as customer demands began shifting toward more specialized and complex parts, one request kept coming up: worm thread grinding.

It was a challenge the Lih-Jaan team was eager to take on – but one that required going beyond their existing capabilities. Worm thread grinding is a niche process with tight tolerances and high complexity. The market was small but growing, and customers wanted machines that could handle low-volume, high-mix production without compromising on precision. Lih-Jaan had the experience and ambition. What they needed was a control solution – and a partner that could move fast. That's where NUM came in.

Laying the Groundwork for Innovation
The partnership between NUM and Lih-Jaan demonstrates the power of long-term cooperation based on mutual respect and shared vision. What began as an initial conversation around the NUMgrind software platform evolved into a strategic alliance driven by innovation and opportunity. A renewed momentum emerged when Lih-Jaan identified a specific market need, leading to a strengthened cooperation between the two companies. Working hand in hand, they developed a customized solution that combines flexibility, user-friendliness, and the ability to support a wide range of worm thread profiles. Despite a few time-related challenges in the final stages, the joint efforts culminated in a successful machine delivery – perfectly timed for its debut at TIMTOS 2025.

Lih-Jaan at TIMTOS in Taipei 2025



Machine in operation

One Machine, Full Functionality
The result was a newly developed worm thread grinding machine. At its core: NUM's Flexium+ 68 CNC system, paired with a version of NUMgrind and worm thread grinding HMI and MDLUX axes. But it wasn't just the hardware that made the difference – it was how the system was engineered to work seamlessly with Lih-Jaan's machine concept.

The machine supports five different types of worm threads, including multi-start threads, and allows for both cylindrical and non-circular grinding – all in one setup. Key features include:

- A user-friendly, application-specific HMI with no programming required
- A custom teach-in interface that simplifies grinding wheel setup
- Achieved roundness accuracy of 2µm
- Optional multitasking: cylindrical and worm grinding on the same machine

"NUM's total solution not only expanded our product portfolio, but also enabled us to realize our goal of developing a specialized multi-tasking machine. In the past, customers needed two separate machines for thread grinding and cylindrical grinding. Now, they can access all functions – including worm thread grinding – in a single, integrated solution," says Ava Tsai, Sales Manager at Lih-Jaan.

Built in a Month – Ready for the Show
Deadlines don't get tighter than this: full commissioning – including sample parts for display – was delivered by NUM within a month. Just in time for TIMTOS 2025.

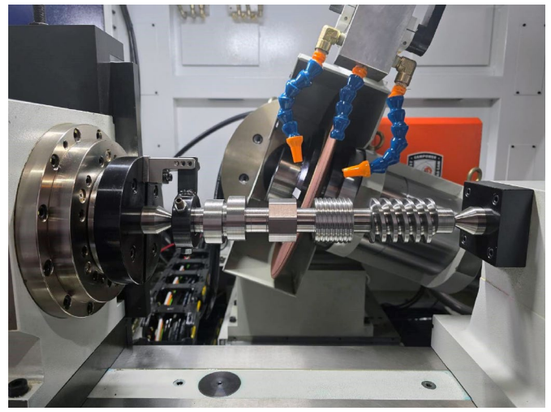
"NUM's total solution not only expanded our product portfolio, but also enabled us to realize our goal of developing a specialized multi-tasking machine. In the past, customers needed two separate machines for thread grinding and cylindrical grinding. Now, they can access all functions – including worm thread grinding – in a single, integrated solution," says Ava Tsai, Sales Manager at Lih-Jaan.

"This kind of execution is rare," Tsai says. "NUM's engineers were proactive, technically strong, and highly responsive. They didn't just support us – they worked like part of our team. They even coordinated with third-party vendors to keep everything on track."

More Than a Vendor – A True Partner
In the end, the success of the project wasn't just about delivering a new machine. It was about building a new capability – and a new kind of relationship.

"We are dedicated to fulfilling customer requirements without compromise." says Johnny Wu, General Manager at NUM Taiwan. "Based on this principle, we don't just stick to what's within our direct responsibilities – we go beyond by proactively engaging with other suppliers, taking the initiative to align on weekly targets, and actively following up on key project milestones."

Looking ahead, Lih-Jaan sees this project as a blueprint for future innovation. With NUM as a technology partner, the company is ready to take on whatever challenges come next.



Various types of demo workpieces

Company building Lih-Jaan

Worm thread grinder machine

Hotman China Accelerates Innovation with NUM's Advanced CNC Solutions

HOTMAN®
豪特曼

Guangdong Hotman Machine Tool Co. Ltd., a leading manufacturer of high-precision grinding machines based in Dongguan, China, has successfully launched its new vertical non-circular grinding (NCG) machine series with the support of NUM's advanced CNC technology and NUMgrind software. This collaboration marks a significant milestone in Hotman's innovation journey, enabling faster market entry, improved efficiency, and enhanced flexibility in grinding complex workpieces.

A Strategic Partnership for Cutting-Edge Grinding Solutions
Hotman, founded in 2003, has established itself as a key player in China's grinding machine industry. With a strong focus on research and development, the company has built a comprehensive product portfolio comprising nearly 100 models across 12 grinding categories.

In 2018, Hotman and NUM initiated their collaboration, which deepened during the trade fair DMP Shenzhen 2021, when Hotman was searching for an advanced CNC solution for non-circular vertical grinding applications. Their key requirement was not just a powerful CNC control system, but a complete solution that seamlessly integrated both CNC hardware and specialized grinding software.

NUM's Flexium+ CNC system and NUMgrind software emerged as the perfect fit for Hotman's needs, offering a highly efficient, reliable, and flexible platform to develop their new Z850 vertical NCG grinding machine.

Introducing the Z850 Vertical NCG Grinding Machine
The Z850 vertical grinding machine represents a breakthrough in precision grinding technology, allowing manufacturers to achieve high levels of accuracy, consistency, and productivity. This machine is specifically designed for non-circular grinding applications, making it ideal for complex workpieces that require precise shaping.

Key Features of the Z850 Grinding Machine:

- Vertical grinding configuration – ensures optimal stability and precision
- 6-station grinding wheel magazine – enables multiple grinding operations in one setup
- Capability to grind OD and ID cylindrical (including cones) as well as non-circular parts
- Direct-drive motor for precise rotary table control – enhances accuracy and surface finish
- In-process measurement system – ensures real-time quality control, including automated calibration
- NUM's CNC Technology: Precision, Efficiency, and Customization

The Z850 is powered by NUM's Flexium+ CNC system, which provides:

- High-performance motion control for ultra-precise grinding operations
- NUMgrind software, which simplifies the programming of complex grinding tasks
- Customizable grinding cycles to meet specific customer requirements
- Seamless integration with automation solutions, increasing overall productivity
- NUM Technology Implemented in the Z850:
    - Flexium+ 68 CNC control system
    - High-performance servo drives and motors
    - Custom-developed online measurement and calibration features

By leveraging these advanced CNC solutions, Hotman was able to reduce its software development costs, accelerate time-to-market, and enhance the overall performance of its machines.

Vertical grinding machine of Hotman: machine in operation

Fast and Efficient Implementation: A Game-Changer for Hotman
One of the most impressive aspects of this collaboration was the rapid implementation timeline. The entire system was developed, tested, and commissioned within just two months – an exceptional achievement that allowed Hotman to launch its new vertical NCG grinding machine series faster than ever before.

Key Benefits Achieved:

- Accelerated time-to-market – fast commissioning enabled a competitive market launch
- Improved efficiency – optimized software and automation reduce production time
- Exceptional stability and accuracy – NUM's technology ensures consistent high-precision grinding
- Seamless machine operation – NUMgrind software makes programming complex shapes easy
- Customized features – adapted solutions for specific customer needs

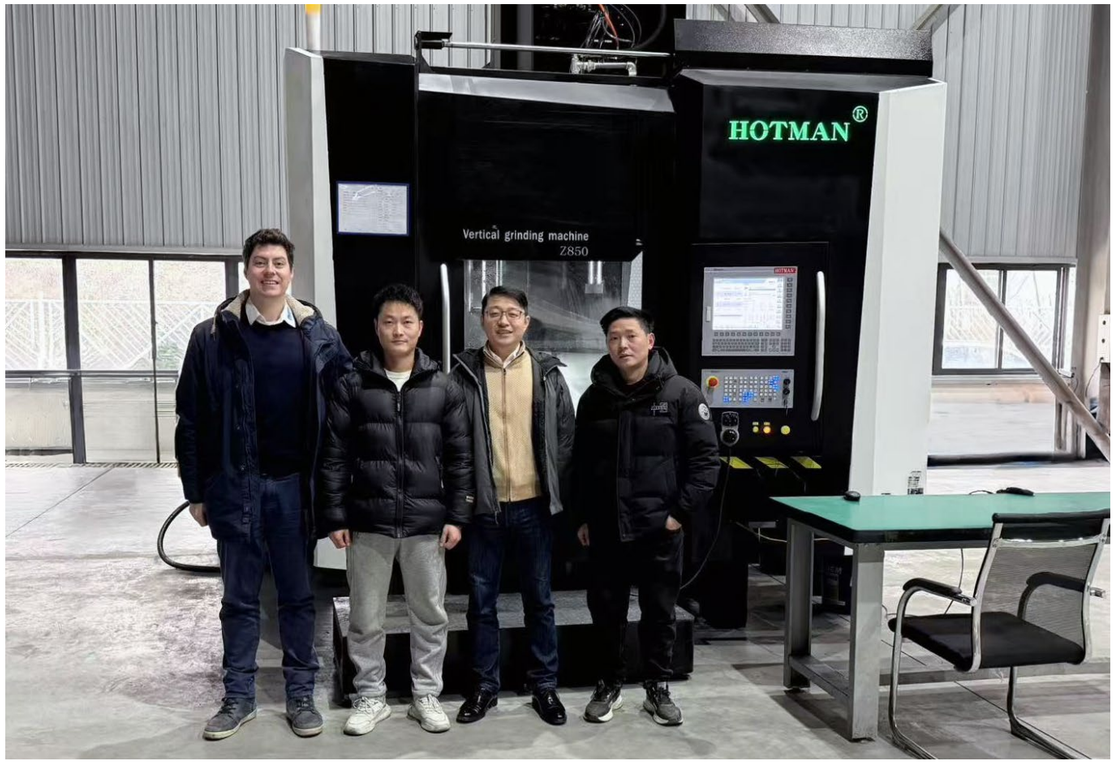
Customer Feedback: NUMgrind Software Transforms Hotman's Production Process
The Chairman of Hotman, Mr. Zeng; highlighted the advantages of working with NUM: "NUMgrind software has significantly improved our ability to manufacture a wide range of complex workpieces. The software makes it much easier for operators to create programs, even for intricate shapes. The imported cross-section profile function is particularly useful for producing challenging components such as camshafts and eccentric workpieces."

The ability to quickly and efficiently program different workpieces has expanded Hotman's market potential and strengthened its position as an industry leader.

The Chairman of Hotman, Mr. Zeng highlighted the advantages of working with NUM: "NUMgrind software has significantly improved our ability to manufacture a wide range of complex workpieces. The software makes it much easier for operators to create programs, even for intricate shapes. The import cross-section profile function is particularly useful for producing challenging components such as camshafts and eccentric workpieces."

A Bright Future: Strengthening the NUM-Hotman Collaboration
The success of this project has paved the way for a stronger partnership between Hotman and NUM. With NUM's cutting-edge technology and Hotman's expertise in precision grinding, both companies are well positioned to drive further innovation and market growth.

As Hotman continues to expand its product portfolio and global reach, NUM remains a trusted technology partner, providing the advanced solutions needed to stay ahead in the competitive grinding machine industry.



From left to right: Mr. Cédric Trachsler, Product Manager NUMgrind NUM, Mr. Fan, Technical Leader Hotman, Mr. Longwei Jiang Managing Director NUM China and Mr. Xi, Electrical engineer Hotman

NUM and Agile Wing: A Precision Partnership Shaping the Future of Multi-Functional Grinding

In Taichung City, Taiwan, where high-tech manufacturing pulses at the heart of industry, Agile Wing is quietly transforming the landscape of grinding machine technology. Though founded just in 2019, this forward-thinking company has carved out a reputation for designing special-purpose grinders that don't just meet expectations—they redefine them. But innovation rarely happens in isolation.

When Agile Wing set out to develop a new generation of multi-tasking cylindrical grinders, they already had a powerful ally in mind. Through their sister company, Speed Tiger, they had long been familiar with NUM's CNC systems and solutions. Speed Tiger had relied on NUM's technology for years, particularly in tool grinding applications. So when Agile Wing faced the challenge of creating a more advanced, more intuitive cylindrical grinder, the decision to partner with NUM felt less like a leap and more like a natural next step.

Challenge: The Uncomplicated Complexity

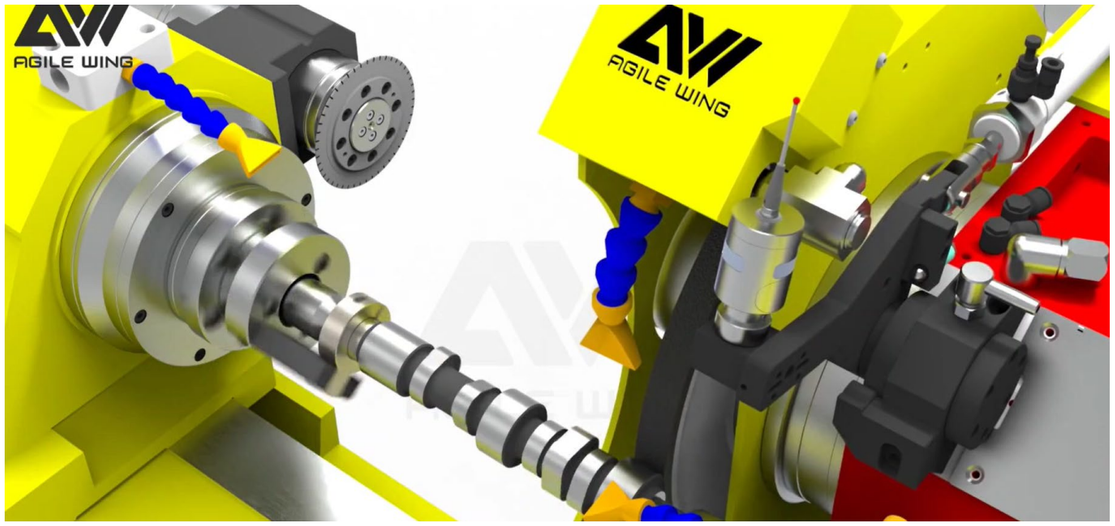
Cylindrical grinding may sound simple, but the demands of modern production are quite different. Agile Wing needed a machine capable of performing high-precision thread grinding, external cylindrical grinding, and non-circular profile grinding – all within a compact footprint. At the same time, operators required an intuitive and flexible human-machine interface to avoid laborious programming. This combination of complexity and usability is where many systems fall short. But not NUM. After multiple technical discussions and product demonstrations, Agile Wing made their decision: they would rely on NUM's solution for all future external cylindrical grinding operations.

The Solution: NUMgrind and Flexium$^+$ 68 – Tailored to Fit

The machine at the center of this collaboration is no ordinary grinder. It's a multi-tasking powerhouse, integrating cylindrical, non-circular, and thread grinding functions in a single unit. Powered by NUM's Flexium$^+$ 68 CNC system with seven MDLUX axes and NUMgrind software, the machine offers a level of flexibility that's hard to match.

The star of the show, though, is the custom HMI developed. "NUM's total solution not only increased our product range," says Agile Wing General Manager Mr. Chen, "but it also achieved our goal of creating a specialized multi-tasking machine. In the past, customers needed two machines – one for thread grinding and another for cylindrical grinding. Now, they get everything in one."

The integration of a grinding wheel magazine and automatic tool changer turned this already powerful machine into a 24/7 production solution. The HMI was even customized to support Agile Wing's unique dual-spindle configuration, letting users choose the spindle directly via the interface—no coding required. This is especially valuable in small-batch, high-mix manufacturing environments, where flexibility and fast changeover are essential.



Machine in operation

Race Against the Clock: From Commissioning to Exhibition

Time was a critical factor. One of Agile Wing's first machines using NUM's system was slated for the CIMT exhibition in Beijing, one of Asia's largest showcases of industrial machinery. That meant tight deadlines for design, commissioning, and logistics.

"One of the biggest challenges was the limited time for commissioning," recalls Mr. Chen. "But NUM's engineers provided almost perfect procedures to support us. In the end, we completed all the tasks and shipped the machine successfully."

This smooth implementation was no accident. It reflected NUM's hands-on, partnership-oriented approach, combining Swiss precision with global agility.

"NUM's system has already integrated and optimized the grinding process functions, which is a very effective approach," says Mr. Chen. "It not only shortens the machine development timeline but also lowers the learning curve for operators."

Benefits That Go Beyond Technology

It wasn't just about hardware and software. It was about vision. "NUM's system has already integrated and optimized the grinding process functions, which is a very effective approach," says Mr. Chen. "It not only shortens the machine development timeline but also lowers the learning curve for operators."

This collaboration isn't simply a supplier-customer relationship – it's a platform for co-innovation. Agile Wing has already begun extending the capabilities of the machines they develop with NUM into highly specialized sectors, for example, the semiconductor industry.

"In terms of intellectual property protection for multi-functional machine development, Agile Wing is committed to significant investment," Mr. Chen explains. "To date, the company has obtained multiple invention patents in countries including the United States, Japan, Korea, China, Germany, Australia, and Taiwan, and has successfully applied these patented technologies to actual products."

Machine ATG 500 C2

A Blueprint for the Future of Grinding

For Agile Wing, this partnership is just the beginning. "The foundation of our cooperation with NUM lies in its strong integration of hardware and software," Mr. Chen says. "We promote in-depth collaboration through an innovation- and invention-driven mindset, aiming to create product differentiation. This approach reflects the future trend in the development of multi-functional machines."

NUM's technology – and their team – have become key enablers of Agile Wing's growth strategy. Together, they are not just building machines. They are building a roadmap for smarter, more adaptable manufacturing. And that's a story still being written.

Machine ATG 500 C2

Power, Precision, and People: How Viking Power Technologies is Shaping the Future of Downhole Drilling

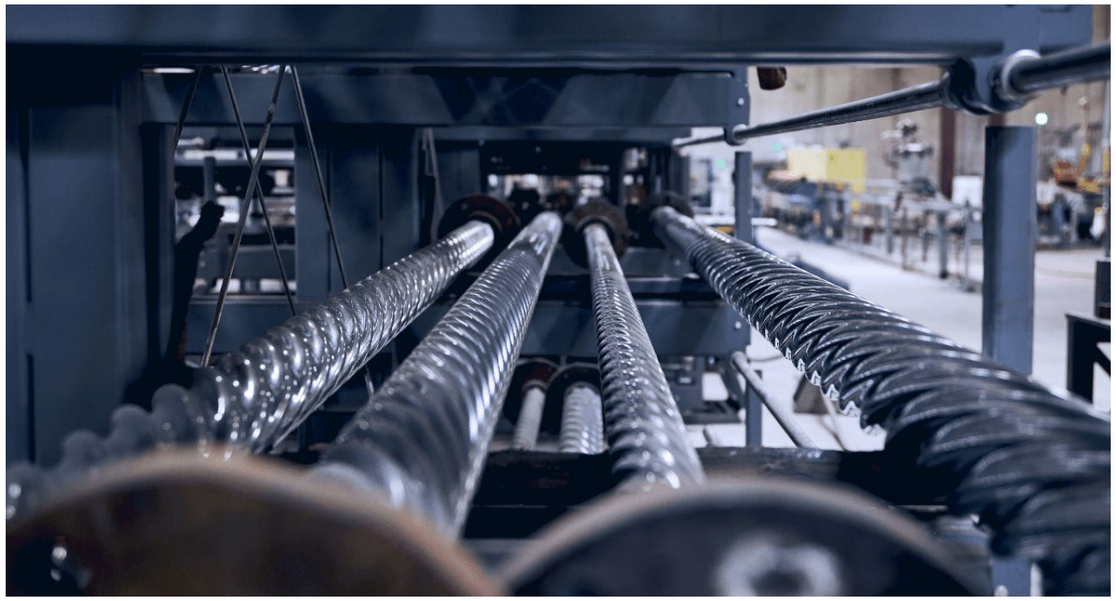
In the heart of Houston, Texas – just miles from the center of the American energy sector, home to numerous corporate headquarters in the oil and gas industry – Viking Power Technologies is shaping the market for drive systems in drilling motors, known as the "power section". Founded in 2021, Viking may be a new name in the industry, but its roots run deep. Its leadership and team bring decades of experience from both sides of the business – as buyers and suppliers of power sections. This dual perspective gives Viking a sharp understanding of what customers need – and what's often missing. The company was built on a foundation of firsthand experience, identifying exactly what worked – and what didn't – when it came to power section design, performance, and delivery. That insight has driven Viking to reimagine how power sections are built and supported.

In-House Precision, Built for Performance
One of Viking's greatest strategic advantages is its commitment to in-house machining. With six high-performance machines from Weingärtner – either new, serviced, or fully overhauled by FS Maschinenbau – Viking has established a vertically integrated operation that controls quality, production schedules, and delivery from start to finish.

Each machine is powered by NUM's Flexium+ CNC system, a robust control platform designed to meet the high-precision demands of the oil and pump industries. This setup allows Viking to manufacture single- and multi-lobe rotors and stator cores to exacting specifications – critical for high-performance downhole power sections.

NUM's control technology supports fast, flexible adjustments, enabling Viking to respond quickly to customer specifications. This agility directly benefits clients through faster turnaround, cost efficiency, and consistent high-quality output.

The integration of NUMSafe and high-performance NUM motors brings an added layer of safety and precision. Together, they enable fully encapsulated, clean, and secure operations – protecting both employees and product integrity. Combined with advanced milling and peeling capabilities, Viking's setup delivers the tight tolerances and repeatability demanded by today's drilling environments.



Workpiece

Weingärtner's Vario and FS Maschinenbau's RMC- and RPE series, known for enabling single- and double-lobe machining in a single system, play a key role in Viking's flexibility. With NUM's control systems in place, Viking can quickly and accurately meet a wide range of customer needs. With its RMC upgrades as part of machine overhauls – in combination with NUM – FS Maschinenbau is taking profile accuracy to a new level.

Technology + Service = Real Results
State-of-the-art machinery and control systems are only part of the Viking story. Equally important is how the company works with customers – directly, transparently, and quickly.

In drilling, time is everything. Delays, miscommunication, or rigid vendors can lead to costly downtime. Viking avoids these pitfalls by prioritizing speed, clear communication, and ongoing collaboration – from initial conversations to post-delivery support.

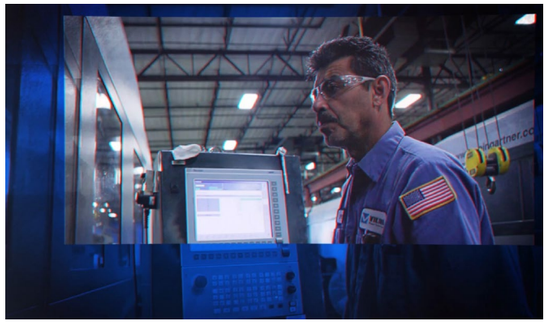
For example, when a client requested a custom-designed power section, Viking worked closely with NUM to tailor the control system to unique production parameters. The result not only met the deadline – it set new performance records in the field and remains one of Viking's most requested products.

This close technical collaboration with partners like NUM allows Viking to shorten development cycles, adapt designs rapidly, and test new solutions with minimal friction – all while upholding the production standards customers rely on.

Built for the Industry, Shaped by the Market
Viking's Houston headquarters offers a strategic advantage. Being close to many of its customers means maintaining face-to-face relationships, responding quickly to new demands, and staying on top of industry trends.

But Viking isn't stopping there. The company recently expanded into Canada, hiring its first regional employee to better understand and serve the Canadian market. This move reflects Viking's larger ambition: to expand across North America while staying agile and customer-focused.

While some customers were initially cautious about working with a newer company, Viking's early results quickly erased any doubts. In this industry, results speak louder than reputation – and Viking's track record has built strong, lasting partnerships.



Machine Display

Looking Ahead: Innovation with Integrity
Viking's future is anchored by three priorities: innovation, sustainability, and people. The company sees itself not just as a supplier, but as a long-term partner in an industry that's constantly evolving.

Its engineering team is focused on developing next-generation solutions by staying closely aligned with customer needs, testing new concepts, and working efficiently and safely to move the sector forward.

This includes continued collaboration with NUM to explore the next wave of control strategies and machining processes – innovations that will help Viking scale, adapt, and deliver even faster.

At the same time, Viking remains committed to its core values. It believes that designing and producing high-quality power sections has a real impact – not just on the industry, but on the people in it. That means operating responsibly, treating employees with respect, and building products that operators can rely on in the field.

In cycle

Conclusion
In an industry where reliability and results matter more than promises, Viking Power Technologies is delivering both. With cutting-edge machines, a strong partnership with NUM USA, and a team that understands the pace and pressure of drilling, Viking is proving that power section technology can be faster, smarter, and more customer-focused.

For companies looking for a true partner – not just another supplier – Viking is ready.

Diager Industrie: A Strong Partner for the Aerospace Industry

Ever since its founding in 1953 by Pierre and Denise Defougeres, Diager Industrie, a subsidiary of the renowned Diager Group, has specified quality, precision, and innovation. The company, based in Poligny in the picturesque French Jura region near the Swiss border, is a leading supplier of solid carbide special tools for the aerospace, automotive, and energy technology industries. Today, Diager Industrie, with around 80 highly qualified employees, produces almost one million high-tech tools annually. Together with its parent company, which has a total of 360 employees, the company is driving technological advances. Diager Industrie is committed to excellent customer service and uncompromising product quality. Thanks to state-of-the-art technologies and the commitment of its employees, every effort is made to reduce the impact on the environment. Diager Industrie relies on sustainable production methods and is continuously reducing its environmental impact by using the latest technologies.

Industry focus and specialties
The tool portfolio quickly reveals the strength of the partnership and innovation in the field of aeronautics: it includes many HVM special milling cutters for machining light metals, plastics, and composite materials. Operations on plastics and light metals are often carried out with tools that have only one cutting edge. Diager Industrie offers a wide range of end mills for such "soft materials" and manufactures them in large series.

Components for aeronautics must be very light yet as strong as steel. These requirements are met by plastics that are reinforced with fibers (e.g., glass, carbon, or others). Such composite materials are very difficult to machine. Consequently, high demands are placed on the tools, and above all, a great deal of experience is required for their design. Diager Industrie has built up this know-how over generations and uses it for the success of its end customers.

The company maintains strong partnerships with well-known companies in the aerospace, energy, mechanical engineering, and automotive industries and focuses exclusively on the development and manufacture of customized cutting tools.

Other highlights of the product portfolio include tools for drilling, milling, and reaming operations, which are optimized through innovative processes. 35% percent of production is standard end mills, while 65% is custom specialty end mills. Diager Industrie also offers comprehensive services, including tool maintenance and resharpening.

Technology and manufacturing expertise
One of the keys to Diager Industrie's success is its close collaboration with NUMROTO. The software is ideally suited for the production of form milling cutters and special tools that require the highest precision. NUMROTO also supports tool preparation with a perfectly adapted solution for cylindrical grinding and end operations.

Diager relies on a pool of 135 machines, 45 of which are CNC tool grinding machines from leading suppliers. These include many NUMROTO machines from the manufacturers Vollmer, Strausak, Reinecker, and TTB. These machines cover the entire manufacturing process from cylindrical grinding to finish grinding. Each of the machines mentioned has its specialties: one can grind very small dimensions with micrometer precision, while the other can optimally grind large diameters or long workpieces. Nevertheless, NUMROTO is always operated in the same way, so Diager Industrie can save a lot of effort in training operating personnel.

The NUMROTO machines are equipped with automatic loaders and robots, so that series of up to 300 tools can often be produced overnight or on weekends. It is important that the ground geometry, such as the diameter or flute depths, is monitored with in-process measurement so that consistently high product quality can be guaranteed.

Thanks to NUMROTO's intuitive 3D simulation, every tool can be analyzed down to the smallest detail before production. The software enables high-resolution visualization of the tool if required and prevents potential sources of error with automatic wheel removal and collision checks. Cyril Jacqueson, a machine technician with over ten years of experience, emphasizes: "NUMROTO is pragmatic and easy to use – an indispensable software in our manufacturing process."

From left to right: Jörg Federer, Head of Application Technology NUMROTO, Gaspard Metra, Methods Manager Diager Industrie, Gustav Heer, Application Technology NUMROTO, Alanis Brelot, CNC set-up operator Diager Industrie and Cyril Jacqueson NUMROTO Specialist Diager Industrie

The partnership specifies that the focus is on expertise and innovative technologies

The NUMROTO Draw function provides precise technical drawings that enable consistent and traceable documentation of existing and new tools. Vectorized NUMROTO 3D tool views are generated automatically, saving time and money when creating product documentation while providing flexibility to customize dimensioning and layout.

Successful applications in practice
Diager Industrie's multi-function tools and form end mills are used for a wide range of applications, particularly in the aerospace industry. Examples of successful applications include form end mills for machining aircraft windows, multi-function tools for drilling, countersinking, and milling, as well as tools for machining demanding materials such as Kevlar, aluminum, and wood.

A look into the future
Diager Industrie is a future-oriented company with a long family tradition. The latest technology, a committed team, and a strong customer focus guarantee that the success story will continue. In collaboration with NUMROTO, the company is setting standards in cutting tool technology – to the delight of customers worldwide.

Diager Industrie's state-of-the-art machinery

Step drill for multiple machining

Countersink bit for compound materials

Bevel milling cutter for plexiglass operation (decorative plate for airplane windows)

Form cutter for titanium-based operations (aircraft engines)

Aluminium milling cutter for aerospace industry

Technological Collaboration Serving the Railway Sector – Handling, Welding, and Grinding of Tracks

Building a fully automated 200-meter-long rail part welding facility is no easy feat, and the companies capable of achieving this can be counted on one hand worldwide. Piacenza-based Provide Solution is one of them, thanks in part to the invaluable support offered by NUM, which, in addition to supplying the numerical control, has developed ad hoc software for this application.

For subsidiaries Provide Solution srl and Labormak srl, which specialize in the design and implementation of automation solutions for a wide variety of application areas, nothing is standard.

"Since our companies are completely devoted to the needs of the customer," explains Labormak Production Manager Andrea Montanari, in fact, "every job order we take on is a real challenge, since it means having to make something that basically does not yet exist and therefore has to be studied, designed and implemented from scratch."

Founded in 2011 thanks to a long experience in the machine tool sector, Provide Solution is now a highly specialized mechanical, electrical and software design center with a staff of 40 people and a turnover of 3.5 million euros. Labormak – with 25 employees and a turnover of 2.5 million euros – handles the implementation and testing for most of the systems developed. Watchword: automation. Regardless of the product sector and, when necessary, with the technological support of high-level partners.

One such partner is NUM, with whom Provide Solution has been collaborating for more than ten years. It all began about four years ago, when Elettri-Fer srl and S.i.c.e. srl – formed in temporary consortium – turned to Provide Solution after winning a tender called by RFI – Rete Ferroviaria Italiana for the construction of a rail welding and finishing plant.

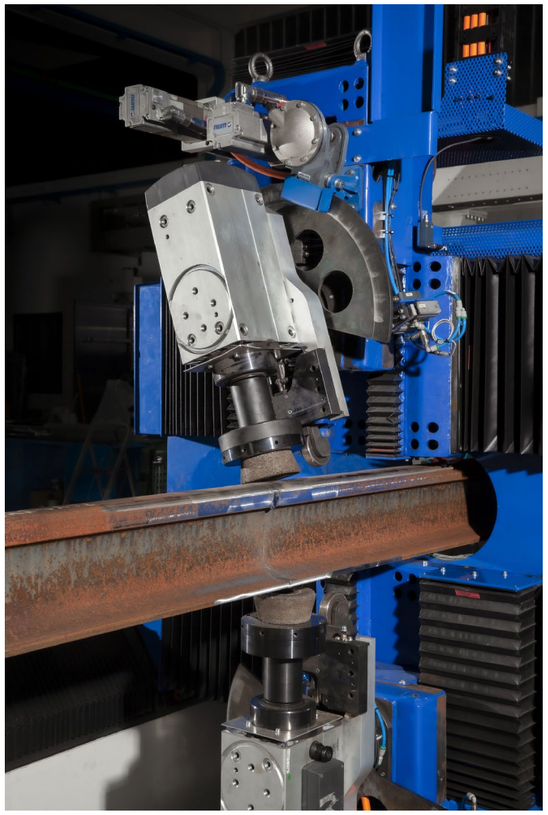
A very complex process that, of course, involves numerous steps, as Andrea Montanari explains "Inside a loading warehouse, pieces of rail to be welded are introduced," he recounts, "which are then moved from one processing phase to another by means of conveyor rollers. In particular, they have to go through brushing, since the ends of each piece have to be cleaned before they can be welded; marking, so that individual pieces can also be identified later and outside the line; and then to the most important and delicate stage, which is the actual welding."

This is followed by cooling, straightening (to remove the deformation caused by the welding), and, finally, the grinding process, which is necessary to eliminate – for safety purposes – even the smallest imperfections. Companies capable of developing such complex plants are few, and Provide Solution is one of them.

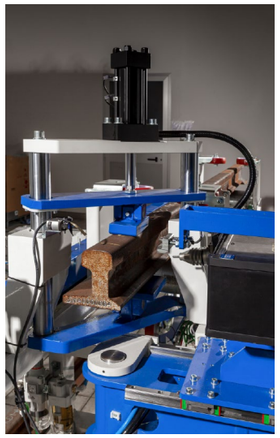
Part of the design complexity undoubtedly stemmed from the size of the line, which spans 200 meters and thus would necessarily have had to be partly outdoors.

Moreover, Provide Solution had to invent a line that would automate a number of operations that had previously been done manually by the operator (such as grinding). Today, there is no human intervention on the line except for the loading and unloading of parts.

"It has happened to us several times in the past to integrate units external to our implementation," Montanari adds. "In this case, however, we are talking about a line made up of several machines,



The machine in charge of removing welding and grinding residue was designed and manufactured entirely by Provide Solution with the help of NUM



There is no human intervention on the line today except for loading and unloading parts

most of them not produced by us, which had to be not only integrated but also customized so that operations could take place fully automatically."

The automation of the entire system therefore came entirely from Provide Solution, as did the brushing machine, the marking device, and the machine in charge of removing residual welding (before) and grinding (after). The latter with the help of NUM.

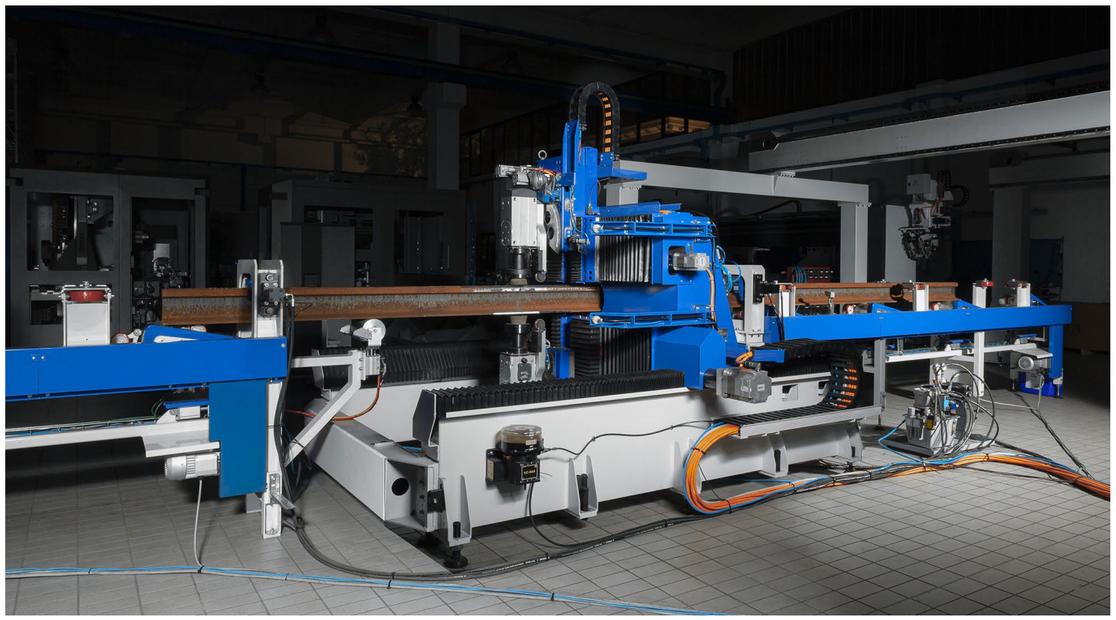
"It was immediately clear to us that, to handle such a complex machine," Montanari continues, "a high-level numerical control would be needed. Since this is a prototype machine, moreover, the decision to involve a technology partner with whom we have been collaborating for years, such as NUM, was also dictated by the fact that, at the outset, we were not perfectly clear on the steps that would lead to the achievement of the final objective and, as a result, it was necessary to analyze every single machining operation." Dealing with a special machine, it was necessary to implement a very flexible CNC that would allow different types of customizations and thus be optimally suited to the needs of this specific application case.

"The system we implemented," points out Marco Battistotti, NUM's NTC Italy Director, "is a Flexium^{+} 68, complete with digital drives from the MDLUX range, brushless motors in the single cable version and equipped with absolute encoders."

The system supplied by NUM is a Flexium^{+} 68, complete with digital drives from the MDLUX range, brushless motors in the single cable version and equipped with absolute encoders

Andrea Montanari then highlights another very important aspect. "On the market," he goes on to explain, "there are no machines for grinding pieces of rail capable of machining it along the entire section profile in a single fully automated process. So much so that for this purpose we had to design and develop an ad hoc one that was able to customize cycles, since when the rail pieces reach the grinding stage they are different from each other. This means that there is no single program that is good for all machining operations, but it requires the intervention of software based on parametric algorithms that, depending on the measurements that are taken, automatically makes the appropriate corrections."

Provide Solution has thus implemented a data acquisition process, depending on which the rail piece will then be machined correctly.



Provide Solution has built a fully automated, 200-meter-long rail part welding facility

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