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→ Case Study

# One Head Length Ahead in Digital Manufacturing

Windschiegl Maschinenbau GmbH and JANUS Engineering AG demonstrate how modern manufacturing works today: Machines, people, and tooling expertise work seamlessly together – digitally connected, scalable, and in a future-proof manner.

## Technical excellence meets digital manufacturing expertise

Windschiegl is renowned for its exceptional in-house manufacturing capabilities: from high-precision engine, camshaft and gear components, through to complete assemblies and machines, right up to large components measuring up to 20 metres in length and weighing more than 100 tonnes.

Windschiegl has been working with JANUS Engineering since mid-2022. What began with the digital integration of a single machine has evolved into a comprehensive partnership covering Siemens NX CAM, machine simulation, postprocessors, tool management, training and support.

Both companies are united by their commitment to safeguarding industrial value creation in Germany in the long term through technical excellence and smart digitalisation.

### Benefits of Windschiegl's digital manufacturing strategy:

- Increased process reliability through stable digital workflows
- Reduced programming times through standardized CAM processes
- Centralized tooling knowledge directly within Siemens NX CAM
- Scalable manufacturing across machines and technologies

## The starting point: Digitalizing the GROB G352

The starting point for the collaboration was the new GROB G352 5-axis universal machining centre. For JANUS, the focus was not on the mechanical commissioning of the machine, but on the NX CAM-side commissioning and digital integration of the entire manufacturing process chain.

- **The objective:** Programming in Siemens NX CAM, realistic simulation and precise NC output via a customised post-processor.
- **The result:** A machine that operated safely, efficiently and with consistent process stability right from day one – because the digital process chain worked.

JANUS supported the process from the digital preparation stage right through to the integration of the programmes into actual production operations. This required the machine kinematics, tool movements, clamping and NC code to interact reliably. This, in turn, created a robust foundation for the further digitalisation of production.

> “A modern machine alone does not create a competitive advantage. What matters is the seamless integration of the entire process chain.”
>
> Martin Höck
> Managing Director of Windschiegl Maschinenbau GmbH

This project laid the foundations for a partnership that goes far beyond traditional CAM services.

## A machine project becomes a digital manufacturing strategy

Following a successful launch, JANUS took over the management of the entire Siemens NX environment. This includes user support, assistance with software updates, and direct access to support and the helpline.

This means rapid support for day-to-day operations, updates without any risk to production, direct access to experts and continuous optimisation of programming processes.

This close collaboration is particularly important when dealing with a high variety of parts. New workpieces, new strategies, new tools – manufacturing continues to evolve on a daily basis. The collaboration between Windschiegl and JANUS ensures that the digital process chain remains stable at all times.

In mid-2023, the next machining centre, a POSmill milling machine, was integrated into the NX CAM process landscape. Accompanying training sessions ensured that staff were able to make immediate use of the expanded capabilities in their day-to-day production work.





↑ Windschiegl GmbH

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## Machines and People: The Formula for Success

Windschiegl invests not only in technology, but also consistently in the further development of its own staff. Training is an integral part of the company's strategy, rather than a one-off measure.

Training is therefore not a one-time element of software implementation. It accompanies the company's technological development. New machines, new machining processes and new software features are systematically integrated into the existing knowledge. New knowledge is shared throughout the company rather than being concentrated in individual employees. This creates stability, ensures quality and enables manufacturing operations to handle even the most complex tasks with confidence.

> “Ultimately, it is this knowledge that makes the difference and thus helps to build competence.”
>
> Martin Höck

## Tool knowledge becomes a digital competitive advantage

At the end of 2024, Windschiegl, in collaboration with JANUS, launched the digitalisation of its tool management. The JANUS Technology Manager creates a central knowledge base for tool data, materials, cutting parameters and tried-and-tested operating parameters.

Once created, tools are available directly in NX CAM. This reduces programming times, establishes standards and makes accumulated expertise reusable.

For a company with the wide range of tools offered by Windschiegl, this is a real driver of efficiency and quality.

## Two worlds, one system: precision meets dimension

The effectiveness of this collaboration was particularly evident in two projects that could hardly be more different. The partnership demonstrates its strength particularly well in two extreme areas of manufacturing.

High-precision engine components on the HERMLE C 62 U MT: simultaneous 5-axis milling, turning, hobbing and components requiring up to 20 hours of machining time. Here, digital preparation is crucial for quality, cycle time and process reliability.

Large-component manufacturing: workpieces up to 20,000 millimetres in length and weighing over 120 tonnes. Errors cannot be corrected, process reliability is essential.

By integrating the Zayer large-scale milling machine with Siemens NX, this production area has therefore also been incorporated into the digital process chain. The same system that programmes high-precision engine components thus also supports the machining of large parts weighing several tonnes. It is precisely this combination of precision and scale that demonstrates just how scalable a unified NX CAM environment can be.

Both worlds now operate within the same NX CAM environment. This demonstrates the system's scalability and stability, from high-precision motorsport components to large components weighing several tonnes.

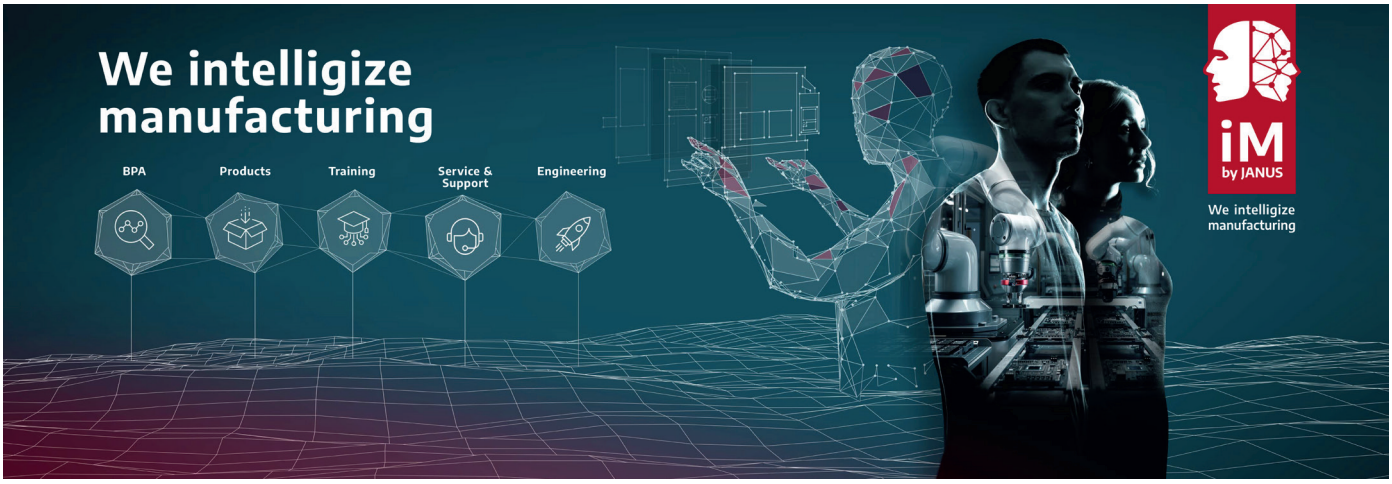



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## Growth requires capacity and a stable digital foundation

In 2025, two further machines were added: the MAZAK VTC-300 and the MAZAK VTC-820. Both were integrated into the existing programming environment. With each additional machine, the demands on programming capacity, data quality and availability increased. Windschiegl took a forward-looking approach and expanded its programming capacity.

In 2026, further training sessions and a comprehensive NX update followed. All machine models, postprocessors and data were carefully coordinated to ensure the stability of the entire system.

In this way, Windschiegl maximises the value of its investments and ensures that new functions can be utilised without risk.

## The next step: merging digital and physical tools

Since 2026, Windschiegl has been working with JANUS and a specialist in physical tool management to connect digital tool data with actual tool inventories.

The potential is considerable. The manufacturing range includes, amongst other things, milling, turning, drilling, grinding, broaching, gear hobbing, gear shaping and broaching. These are complemented by the production of large and small components, engine manufacturing, camshafts, gears and a wide range of special components. This results in an enormous variety of tools, toolholders, components and machining parameters.

In the future, it should be possible to see exactly which tools are available, where they are located, what condition they are in and which upcoming production orders require them. This is intended to reduce tool search and preparation times, avoid duplicate inventories, improve the utilisation of existing tools and provide a more reliable data basis for purchasing decisions.

The aim is to achieve full transparency regarding all tools, clear stock levels, reduced search times, better utilisation of existing resources and well-informed procurement decisions.

Both companies expect the investment to pay for itself quickly through improved tool availability and optimised inventory levels.

The actual economic benefits will be measured and evaluated using clearly defined key performance indicators from ongoing operations.

> “We want to know at all times which tools are available and what actually needs to be purchased.”
>
> Martin Höck

## Developing manufacturing together

What began with the integration of a single machine has evolved into a continuously growing manufacturing environment: GROB, POSmill, HERMLE, Zayer and MAZAK, all integrated into a common NX CAM environment. This is complemented by tool management, training, updates, support and additional programming capacity.

**The goal is clear**: a manufacturing environment in which machines, programs, tools, data and people work together reliably.

> “Success is built on shared growth, trust and technical refinement.”
>
> Martin Höck

The NX CAM process landscape is managed collaboratively and complemented by a helpline and ongoing support. This is not just about individual post-processors or software licences, but about a manufacturing environment in which machines, programmes, tools, data and staff work together reliably. New technologies are integrated into an overall system that evolves in line with the company's requirements.

## From projects to an intelligent manufacturing environment

Windschiegl is a prime example of what iM by JANUS stands for: taking a holistic approach to manufacturing, connecting processes digitally and driving intelligent, continuous improvement.

Machine integration, simulation, postprocessors, NX CAM, tool management, engineering, training, service and support – all elements work together seamlessly and evolve in line with the company's requirements.

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## One head length ahead in Digital Manufacturing

The owner-managed Windschiegl Maschinenbau GmbH is a highly regarded partner worldwide for demanding drive and manufacturing technology. Our components are key enablers in modern high-performance applications – on land, at sea, in the air and on the racetracks of international motorsport.

Our expertise covers the entire spectrum of gear manufacturing, delivering the highest levels of precision at every stage. One of our key specialities is the high-end finishing of complex cast components. From motorsport-proven cylinder heads to heavy-duty gearbox housings, we use innovative 5-axis technology to perform the final machining of even the most demanding geometries with uncompromising dimensional accuracy.

Windschiegl delivers premium quality from a single source – always one step ahead.

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JANUS Engineering is the expert team that loves challenges. Where others see the limits of what is possible, we create solutions for greater efficiency in CAD / CAM / PLM. In more than 30 years of active use of NX, we have gathered a unique wealth of experience that we use every day as a team and continue to expand for our customers. So that good ideas, perfect processes and the right tools can lead to the production possibilities of tomorrow.

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Build
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