hyperMILL®
CAD/CAM

© The helmet was programmed and produced by DAISHIN

hyperMILL®
OVERVIEW

OPEN MIND
THE CAM FORCE

“We want to be the best and most innovative CAM software developer in the world.”

Volker Nesenhöner, CEO at OPEN MIND Technologies AG

Discover *hyper*MILL® – the powerful end-to-end CAD/CAM solution that can handle any manufacturing task!

*hyper*MILL® empowers you to boost your performance in programming and machining. Our software provides innovative CAM technologies on a dedicated CAD platform, ranging from 2.5D, 3D, 5-axis and turning strategies to additive manufacturing solutions. Whether it’s automation, simulation or virtual machining – future-proof technologies expand the product range and enable seamless digital process chains.

CREATE THE FUTURE OF MANUFACTURING TOGETHER

*hyper*MILL® represents the crucial puzzle piece for your future-ready connected manufacturing environment. Thanks to the perfect integration of all relevant areas, you gain a smooth flow of information and benefit from useful synergies. With the Hummingbird integration, you can take the planning and control of your manufacturing processes to a completely new level. Using *hyper*MILL®, you will overcome any challenge and always get the most out of your machines and processes.

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Summarized for your convenience: all *hyper*MILL® machining strategies at a glance!

7 Reasons to choose *hyper*MILL®

Trend-setting CAD/CAM solution

- Forward-looking investment
- Top performance
- Intuitive operation
- Efficient and reliable processes
- Optimized workflows
- Powerful automation technology
- Outstanding quality

Are you looking for ways to meet increasing demands and keep pace with technological advances? Then make a decision to implement *hyper*MILL® CAD/CAM system. The comprehensive functions and groundbreaking technologies of *hyper*MILL® make a strong case for investing in a future-ready and interconnected CAD/CAM solution.

INDUSTRIES

Successfully used worldwide in a broad range of industries

CAD/CAM software has become an integral component in various industries and continues to revolutionize design and manufacturing processes. Proven know-how, tailor-made functions and innovative solutions make *hyper*MILL® what it is in modern production: the key to success in nearly any industry.

Tool and Mold Making

Production Machining

Modelling and Prototyping

Aerospace

Automotive and Motorsports

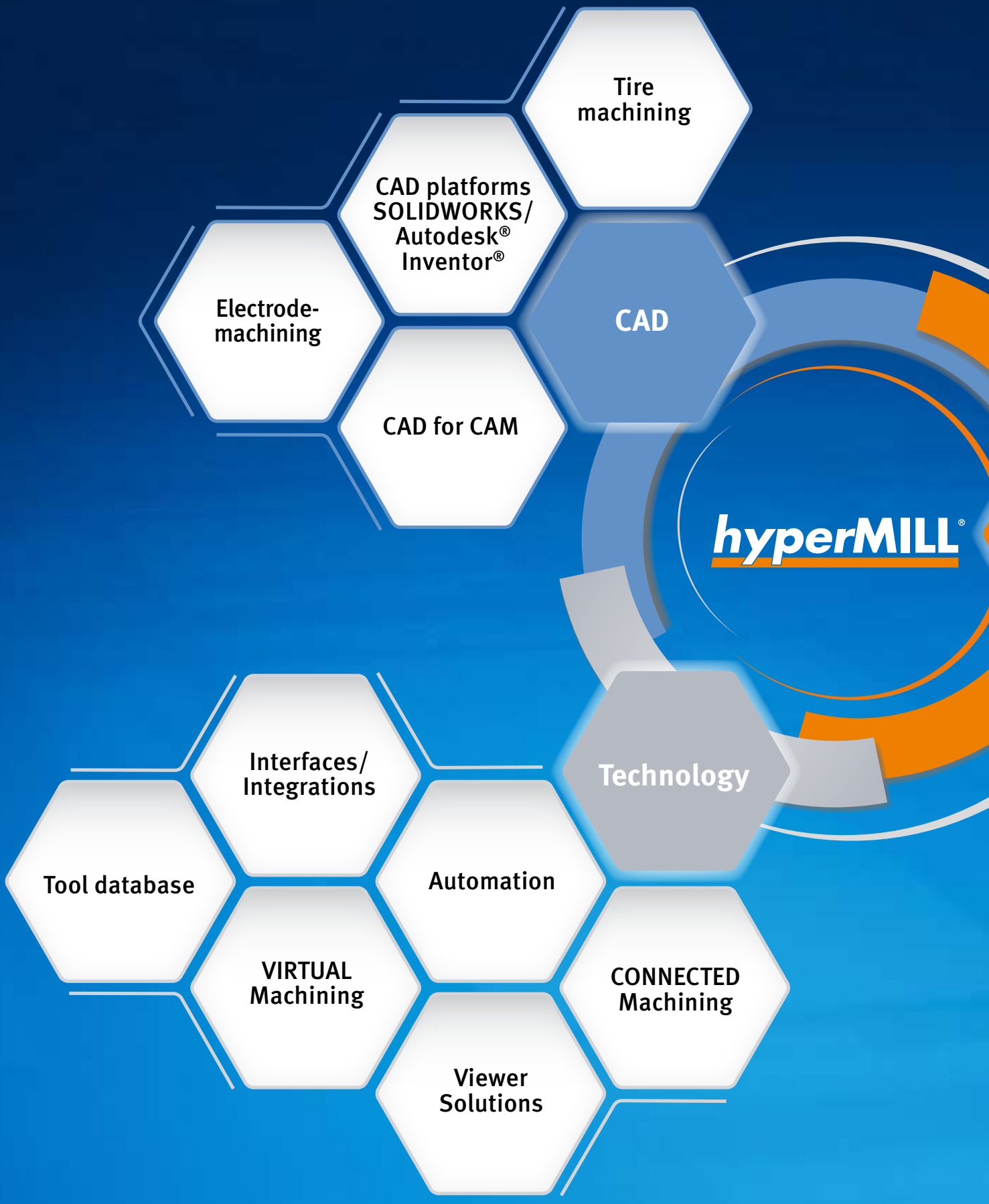
Turbomachinery and Energy

Medical Device Industry

Semiconductor Industry

Watches and Jewelry

PRODUCT OVERVIEW



CAM
5-axis milling
Impeller/ Blisk
Turbine blades
Blow molds
Tubes
KNIFE Cutting
3D milling
MAXX Machining
2.5D milling
High-precision machining
Rest machining
Drilling
Additive manufacturing
TURNING Solutions
BEST FIT
Wire EDM
JIG Grinding
PROBING

CAD

6–9

Learn more about our special CAD technology and our dedicated solutions for electrode and tire machining

CAD

CAM requires CAD. Owing to the pioneering development of our own CAD kernel, we are able to design our CAD/CAM system to perfectly meet the requirements of programmers.

Everything in one software

CAM and CAD software work hand in hand. The CAD system displays the digital 3D model and simultaneously provides all component information relevant to production. Our *hyper*MILL® CAD/CAM system provides the perfect foundation for CAM programming. This makes it easy to create auxiliary designs and make necessary changes to the parts.

*hyper*MILL® is also available as a version that fully integrates with Autodesk® Inventor® and SOLIDWORKS.

CERTIFIED Gold Product SOLIDWORKS

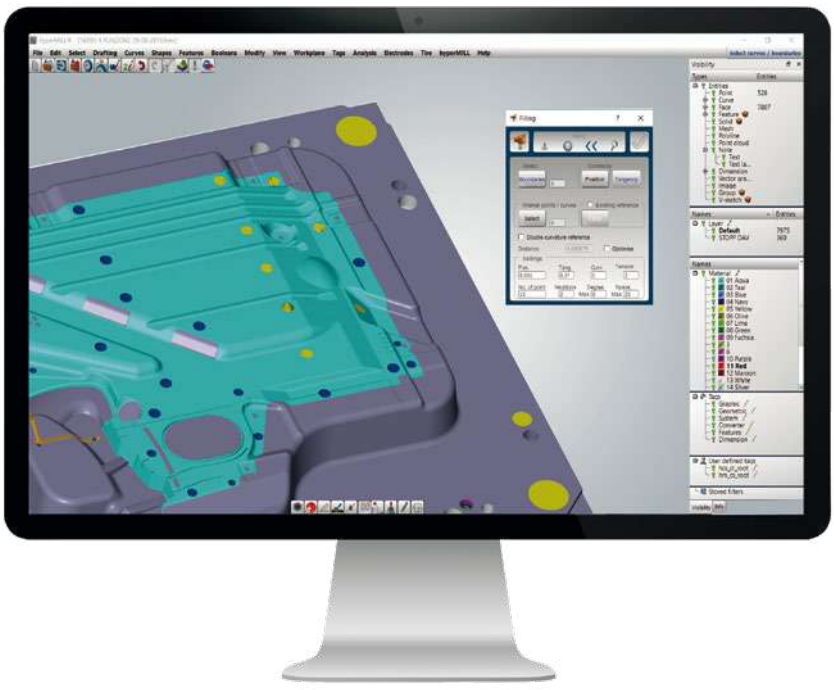
AUTODESK Inventor CERTIFIED APP 2024

CAD for CAM – *hyper*MILL®

Our CAD functions and CAM software work together seamlessly and are perfectly geared to NC programming processes. Points, curves, surfaces, solids, or polygon meshes can be processed with ease. Elements can be quickly added, deleted, modified, shown or hidden. Our CAM strategies come with integrated CAD functions and generate required features, such as surface extensions, fully automatically. This increases programming efficiency and reduces the effort required for part preparation.

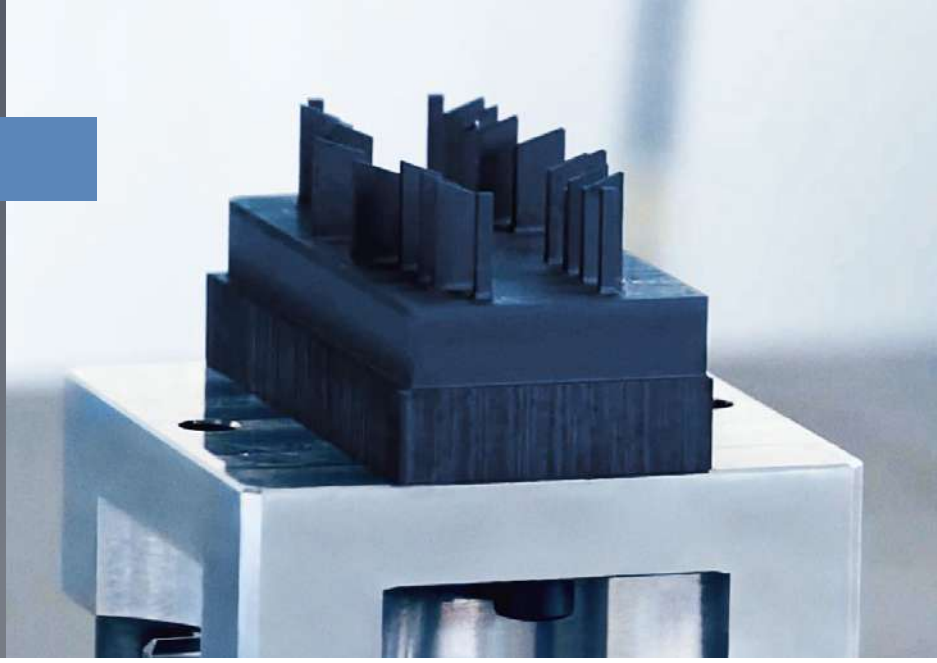
*hyper*MILL® CAD base at a glance

- Comprehensive interface package
- PMI support
- Analysis and repair functions
- Data preparation for programming
- Comprehensive surface functions
- Feature-based design
- Parametric design
- Customized filter functions
- Smart selectors (selection functions)
- CAD functions integrated into *hyper*MILL® jobs



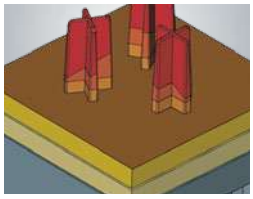
Electrode Machining

*hyper*MILL® Electrode – our module for manufacturing electrodes easily and safely: from design and CAM programming to the milling stage.

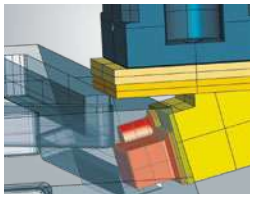


Electrode creation

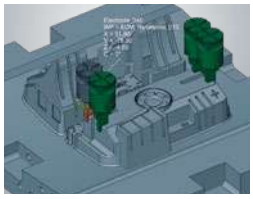
Our electrode module allows you to automate most of the design process. After the programmer selects the surfaces to be eroded on the part geometry, the module creates matching electrodes that ensure collision-free machining. If necessary, the electrode surfaces are extended automatically.



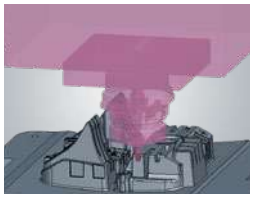
Rotational electrode



Side electrode



Virtual electrode



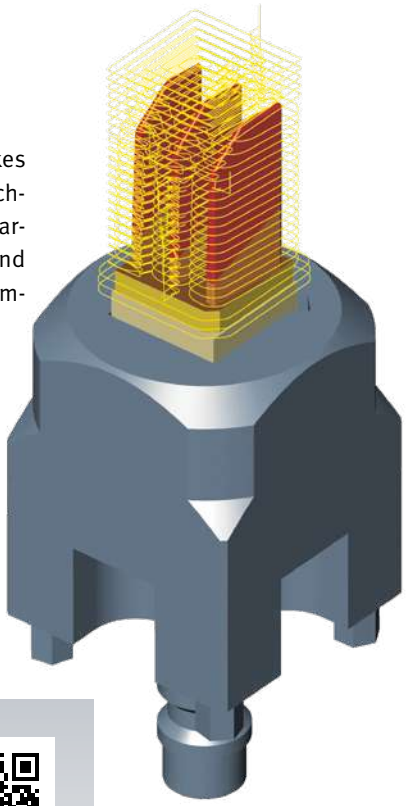
Collision avoidance

*hyper*MILL® Electrode Converter

The Electrode Converter is a convenient tool for creating import files for eroding machines. Toward this end, the converter creates an import file including all necessary technology parameters based on the technology and electrode information in the electrode module.

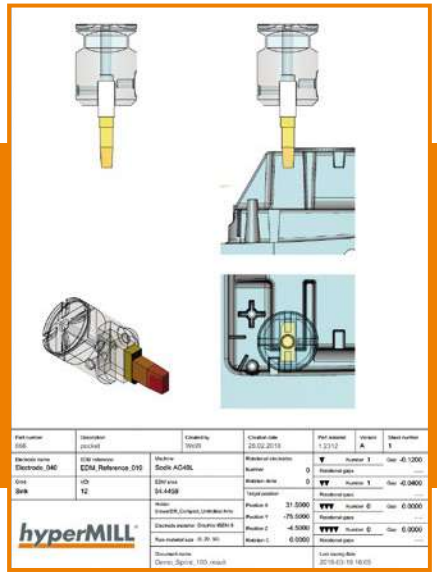
Programming in *hyper*MILL®

Seamless transfer to the programming step takes place based on the geometry as well as on technological information. Allowances and milling areas are automatically adopted in *hyper*MILL®, and thanks to machining macros, electrode programming can be automated to a large extent.



Documentation

You can generate a print preview that includes technology data for individual electrodes or for all electrodes.



Learn more about *hyper*MILL® Electrode

Tire Machining

Intelligent automated features, convenient CAD functions and efficient milling strategies ensure that you always stay on track during tire machining.

Mastering complex tasks with precision

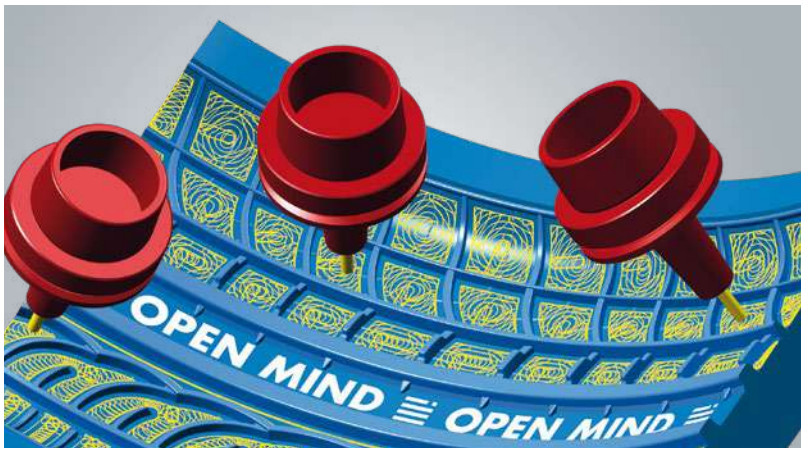
The complexity of tire shapes with curved hub surfaces, sloping walls and many irregular geometries makes programming a challenging task. A tire profile does not consist of repeating identical sections but of many sub-segments (pitches) of varied sizes. *hyper*MILL® offers intelligent CAD and CAM functions that enable efficient and reliable machining.

Data preparation and programming

Based on the 3D pitch geometry and the tire definition in *hyper*MILL®, the tire clock and all segment models as well as stocks can be created automatically. This includes labeling all elements and trimming the surfaces at the segment boundaries. In addition, all elements are sorted into a layer structure and stored in project folders. Our tire browser greatly facilitates the management of individual pitch geometries and displays the respective geometries at the push of a button. This enables you to carry out programming quickly and efficiently without losing sight of the big picture. Thanks to pitch-driven programming, you only have to program each pitch once. After this is done, the toolpaths for all segments are generated at the push of a button. *hyper*MILL® also takes care of sorting, linking, trimming the toolpaths at the segment boundaries and collision checking for the corresponding segment model.

CAM strategies for your business success

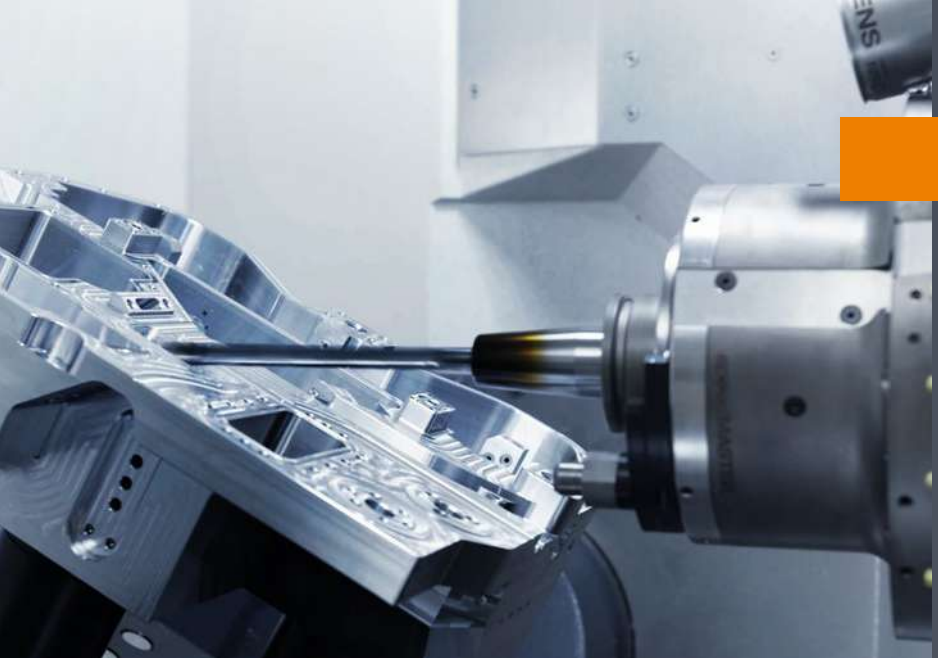
Our machining strategies ensure that you can machine tire segments in the most economical manner possible. Powerful 3D and 5-axis strategies provide the decisive advantage here. For example, 5-axis trochoidal toolpaths can be created for roughing areas with curved hub surfaces. Increase your profitability and benefit from a convenient and highly automated CAD/CAM solution for tire machining!



CAM

10–31

Our extensive range of machining strategies makes *hyper*MILL® unique. Boost your productivity, from standard manufacturing processes all the way to special applications!



Drilling

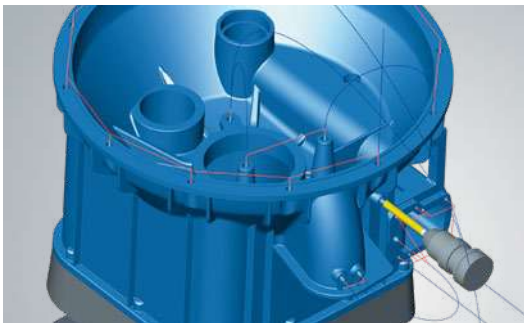
*hyper*MILL® offers you strategies for a wide variety of hole types. Various sorting options ensure an ideal workflow during processing. Thanks to parameters such as dwell time, chip breaking or overlap, machining can be perfectly adapted to the part or material properties.

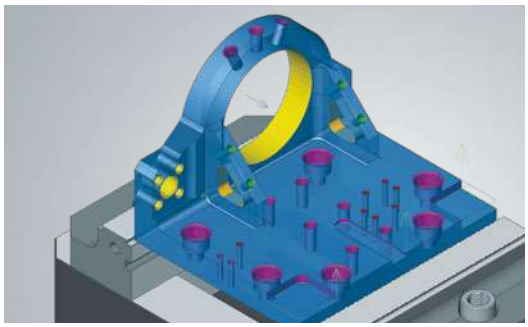
2D and 5-axis drilling

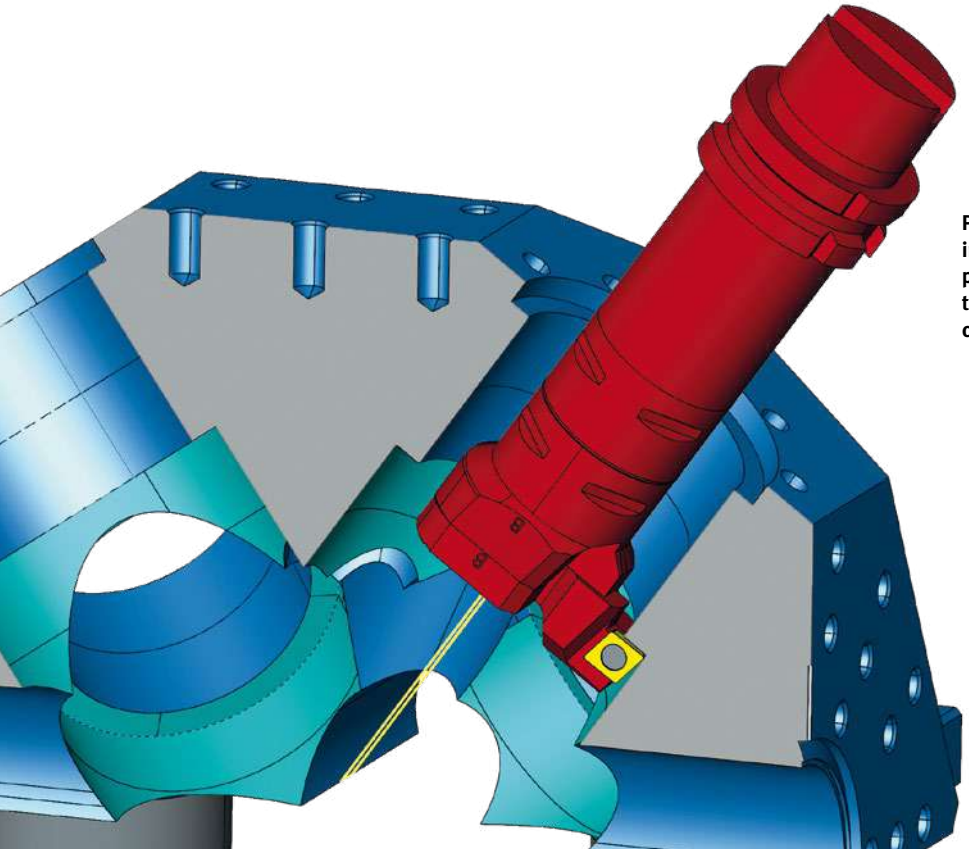
All drilling strategies can be output as pure 2D machining, indexed 2D machining or 5-axis drilling. In 5-axis machining, the holes can be linked by an optimized movement close to the part thanks to the “Smooth linking” function.

Automated programming of holes

All holes on a component are detected automatically, including their inclinations, and can be programmed as features. In addition, you can program the detected holes automatically in just a few clicks, using a machining macro.





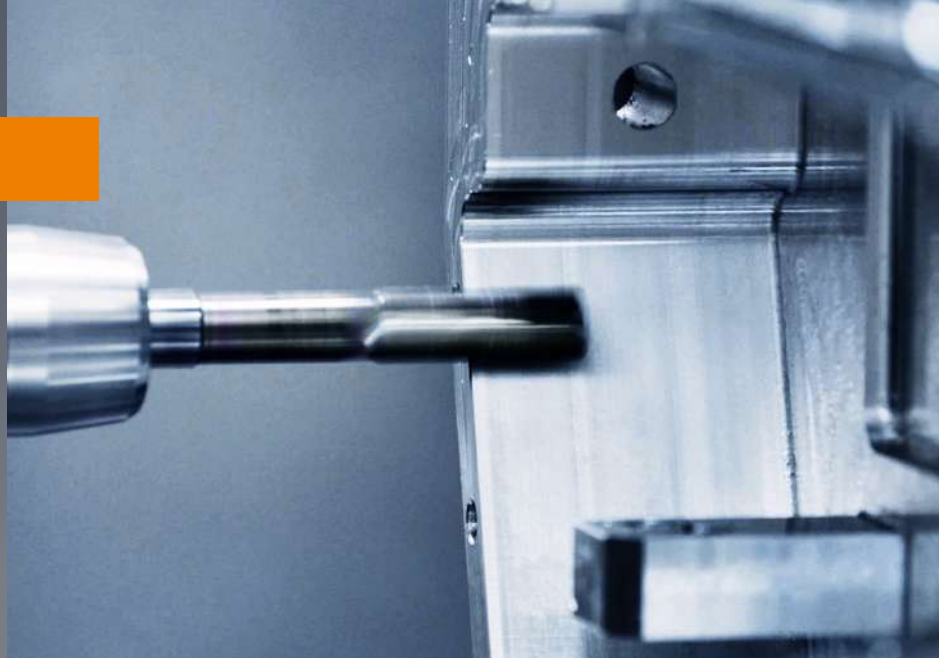


Process-reliable back boring based on 3D tool mapping, kinematics-based tool orientation and NC code simulation

Back boring explained in the video

2.5D Milling

*hyper*MILL® provides intuitive strategies for 2.5D machining of pockets, plane surfaces or contours. With just a few clicks, you can program efficient toolpaths for roughing, rest roughing, finishing and deburring.

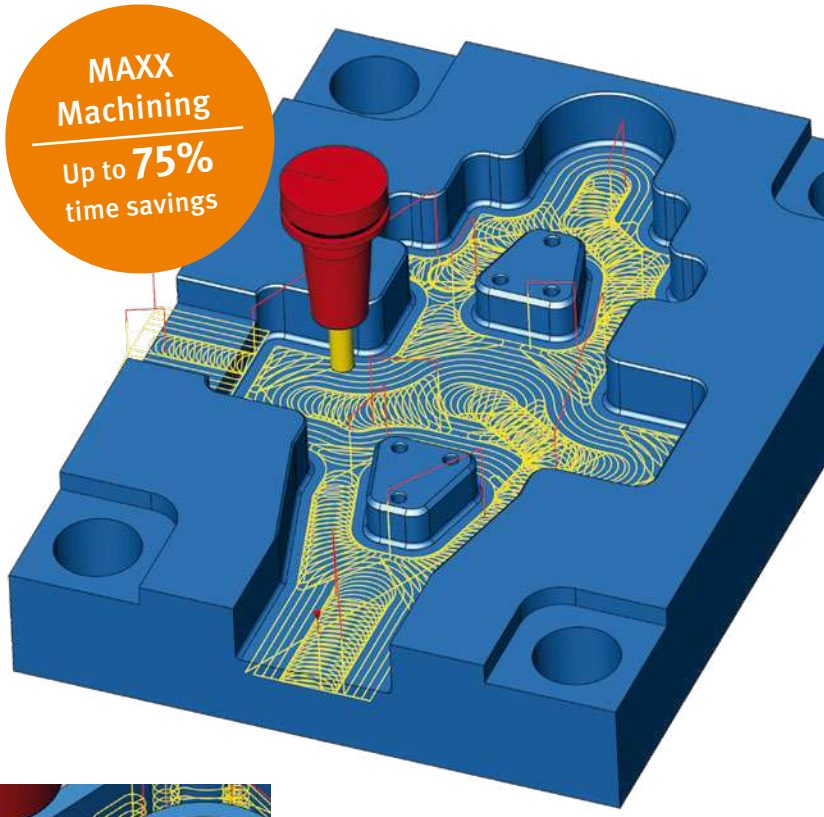


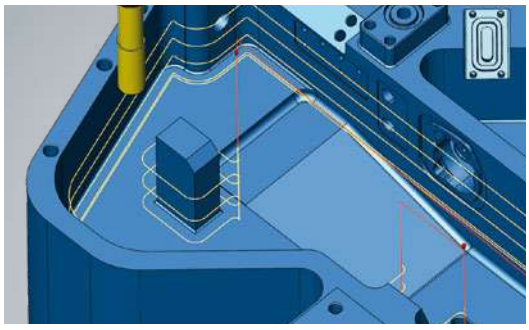
Efficient programming and machining of pockets

We offer powerful roughing strategies for open and closed pockets of all types. From conventional contour-parallel machining to high-performance cutting (HPC) with trochoidal toolpaths. Thanks to feature and macro technology, pockets are detected and programmed in an automated manner.

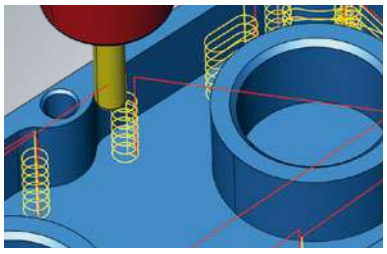
Machining 2.5D contours reliably

Machine open and closed contours using collision-checked toolpaths as well as the option for path compensation and automatic sorting. Optimized approach and retract movements ensure top component quality thanks to smooth overlapping in transition areas.

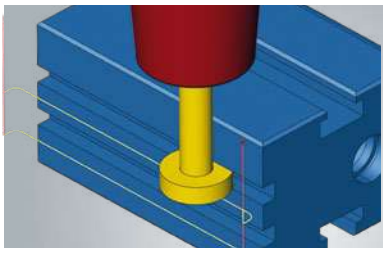




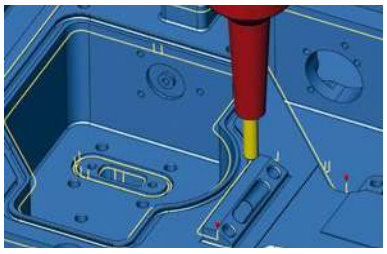
Contour milling



Rest machining



T-slot milling



Chamfer milling

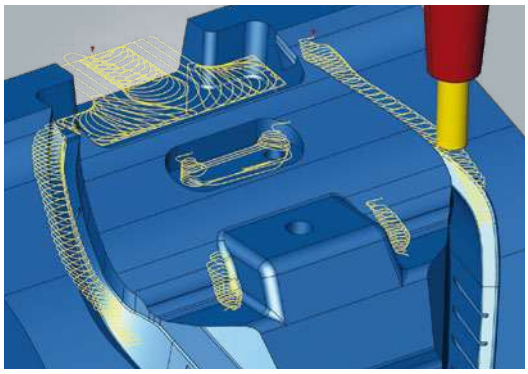
Scan the QR code now to learn more about 2.5D milling

3D Milling

Rely on powerful strategies for 3D machining to produce components of any shape efficiently and with superior surface quality. Intuitive programming and safe collision control make roughing, finishing, and rest machining a breeze.

Roughing and rest machining

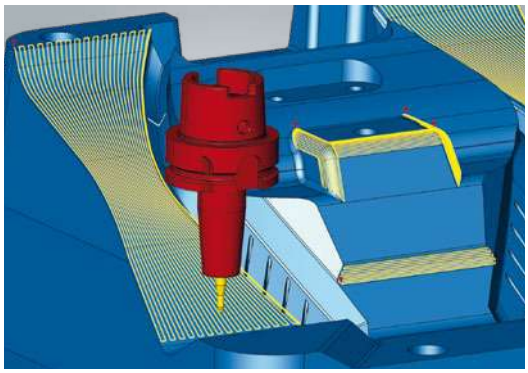
Don't waste time on roughing and rest machining – use the efficient strategies of *hyper*MILL® instead! Not only do they empower you to create toolpaths for traditional roughing, but they also support toolpaths for high-feed and high-performance cutting (HFC and HPC). *hyper*MILL® provides a suitable strategy for general rest material areas or rest material in corners.



Discover the full range of *hyper*MILL® 3D strategies.

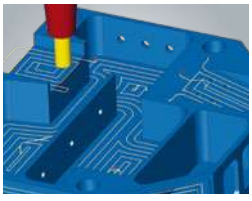
Finishing with perfect surfaces

Our finishing strategies deliver excellent machining quality and offer innovative features that make programming easy. Automatic surface extension, for example, eliminates the need for manual adjustment of machining surfaces. Transition areas are automatically optimized thanks to the "Smooth overlap" function. For even more surface accuracy, you can calculate toolpaths on the CAD surfaces directly.



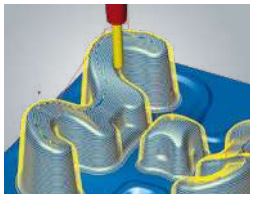
A selection of strategies that leaves nothing to be desired

The Classic package offers you versatile standard strategies for 3D machining. With the Expert package, you have access to additional special strategies beyond the standard scope. This includes strategies for machining cutting edges, rib and fillet milling, as well as special strategies for surface and rest machining.



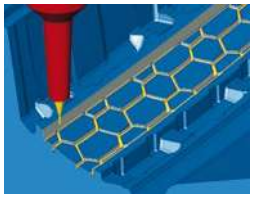
Plane machining

Free path milling



Equidistant milling

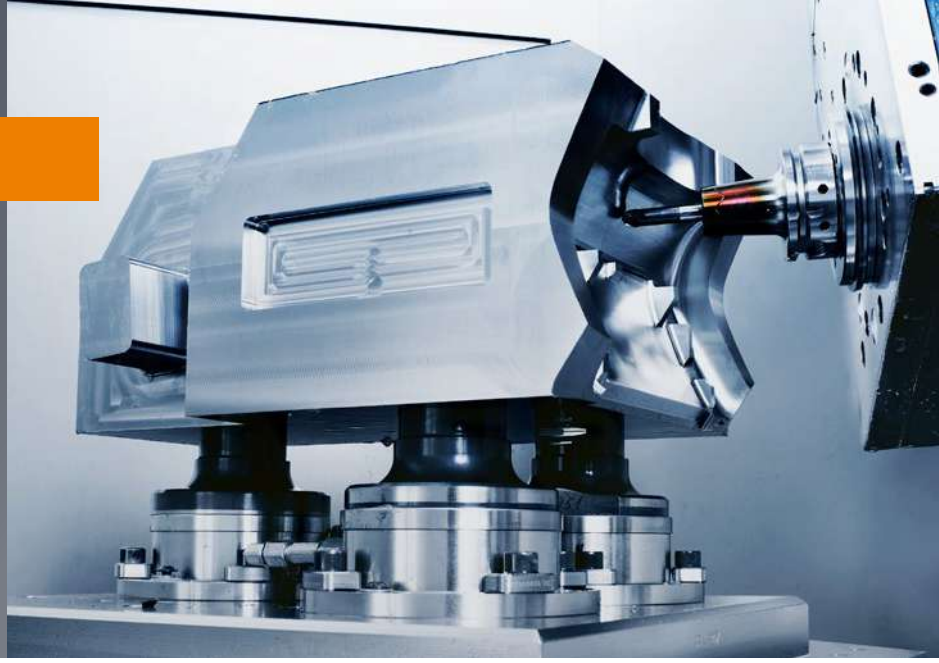
Cutting edge machining



Rib machining

5-axis Milling

5-axis pioneer OPEN MIND has developed innovative and user-friendly milling strategies for 5-axis machining from day one. Therefore, *hyper*MILL® is up to even the most demanding tasks. You can rely on our algorithms for toolpath calculation and collision avoidance!



Simple programming

One of the many things that make *hyper*MILL® stand out is its user-friendly programming. Intelligent algorithms support you in programming even the most complex machining operations with little effort. It is up to you whether to use the automatic mode or define all parameters manually. This means that the tool guidance can be individually adapted to the component conditions and your own 5-axis know-how. Thanks to the extensive selection of standard and special strategies, you can manufacture even the most demanding parts reliably and efficiently and give all surfaces the perfect shine.

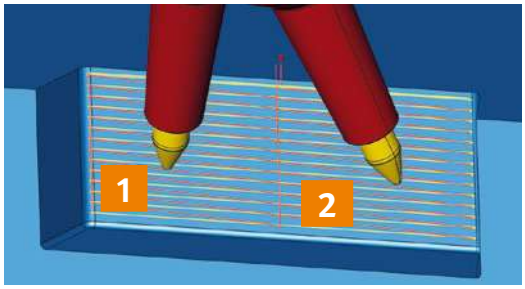
Discover the full 5-axis range of *hyper*MILL®!

Multi-axis machining: 3+2-indexed and 5-axis simultaneous

The advantages of multi-axis machining are plain to see. It offers practical advantages such as optimal component accessibility in addition to technological advantages. Short tool stickouts provide more stability during machining and allow the use of better cutting parameters.

In 3+2 machining, the component is positioned accordingly in space, and the actual machining takes place in 3-axis operation. This approach makes it very easy to achieve good accessibility and technological advantages.

5-axis simultaneous machining, on the other hand, uses all axes of the machine simultaneously and allows complex geometries to be machined efficiently and safely in a single go. One of the strengths of *hyper*MILL® is active collision avoidance. It guides the tool during machining in such a way that collisions with the component, holder or clamping device are avoided.

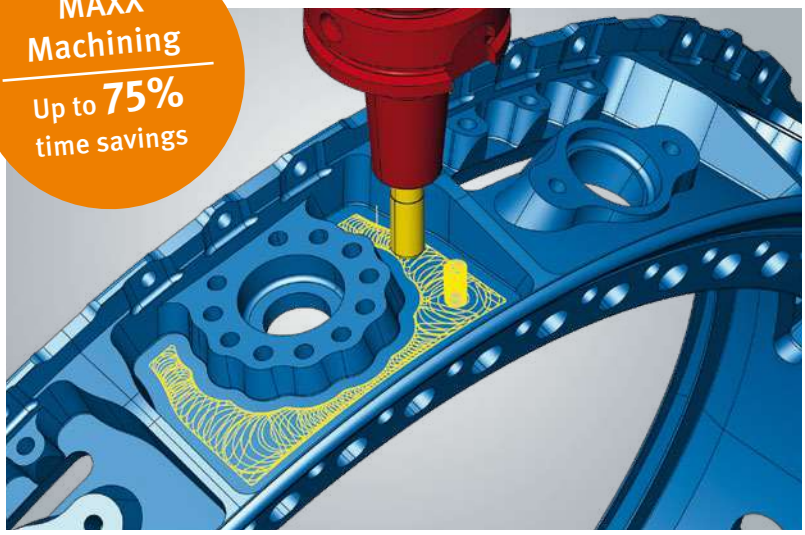


5-axis halfpipe machining

This strategy is perfectly suited for machining strip-shaped recesses or grooves with variable cross-sections. The range of applications goes far beyond the milling of simple geometries.

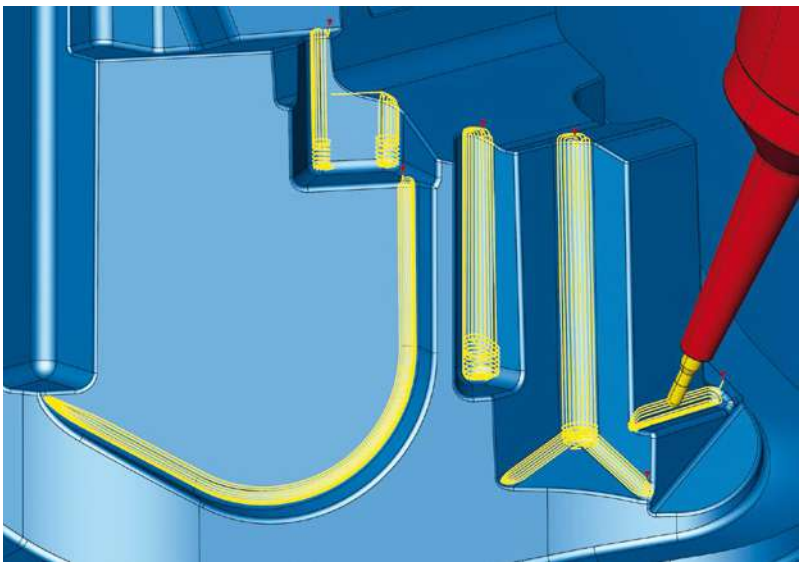
MAXX Machining

Up to 75% time savings



Roughing strategies

Take full advantage of a 5-axis machine even when roughing. This allows you to rough deep pockets with a short tool thanks to simultaneous inclination. When working with curved surfaces, 5-axis roughing is the most efficient strategy as it allows you to achieve a uniform allowance for subsequent machining operations.

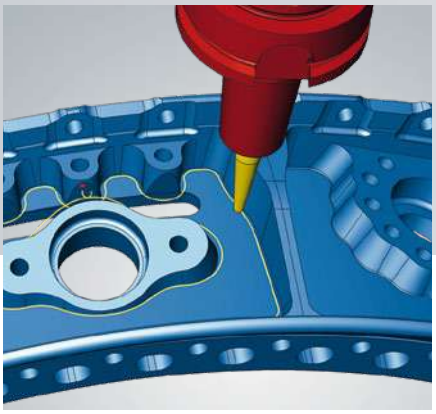


Rest material strategies

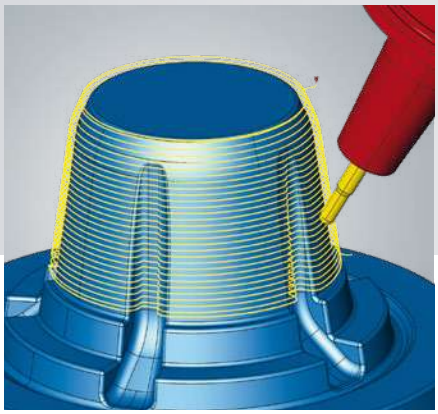
Thanks to our 5-axis simultaneous strategies, you no longer have to worry about hard-to-reach rest material areas. This is because it makes machining such rest material areas very easy. *hyper*MILL® automatically determines all necessary tool inclinations.

Finishing strategies

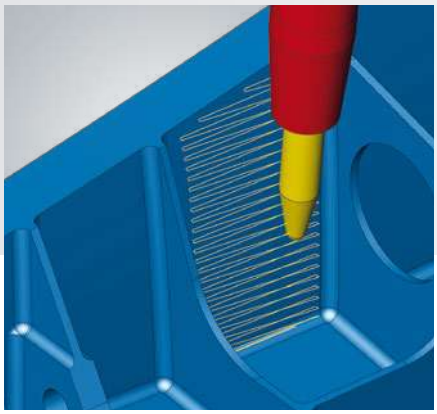
*hyper*MILL® offers a suitable finishing strategy for any type of machining and component surface. 5-axis, contours, curves, plane, and free-form surfaces can be machined using various strategies. Swarf cutting, top milling, and tangential milling enable the safe use of different tool types in *hyper*MILL®. High-quality surfaces are guaranteed thanks to smooth tool guidance, HSC functions and our “High precision surface mode”.



5-axis swarf cutting



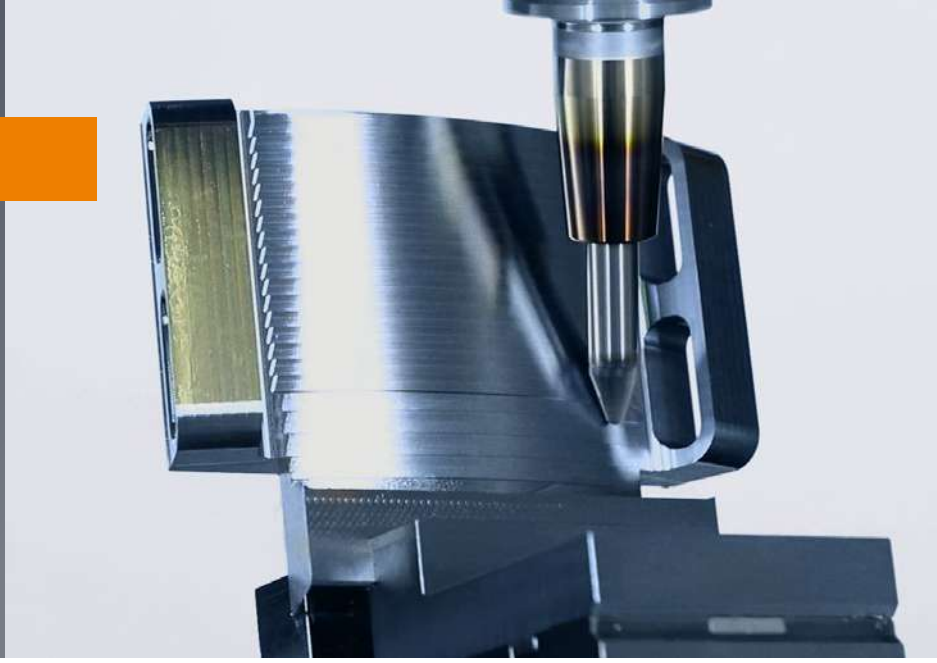
5-axis Z-level finishing



5-axis tangent plane machining

MAXX Machining

Benefit from the outstanding performance of our three modules for drilling, roughing, and finishing. *hyper*MILL® MAXX Machining delivers a decisive competitive advantage through various technologies and the use of innovative tools.



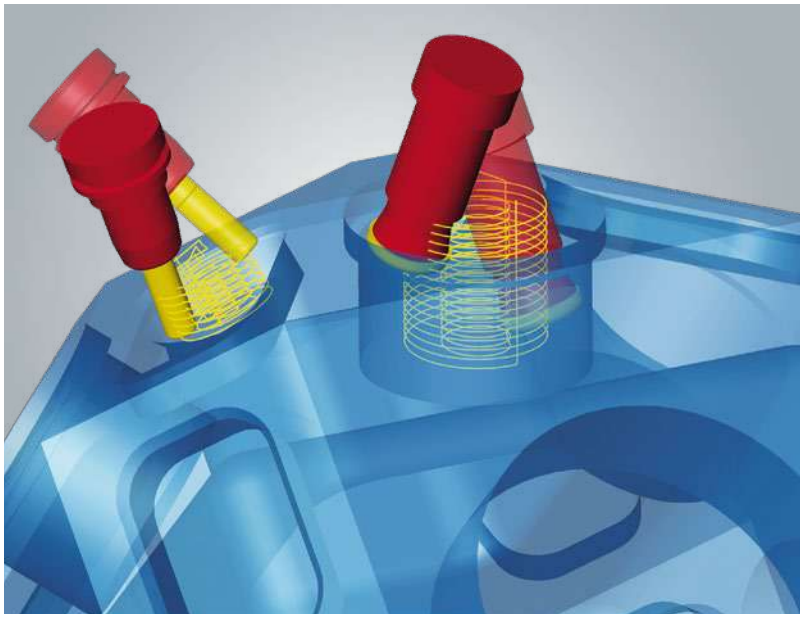
High-performance machining taken to the next level

Trochoidal toolpaths for milling are not the only thing *hyper*MILL® MAXX Machining excels in! Our performance modules enable you to drill, rough and finish faster without the loss of quality. We offer solutions for milling and turning.

Drilling | Roughing | Finishing

Drilling

5-axis technology is the key to revolutionizing seemingly simple machining tasks. Circular pockets can be produced with minimal wear on the milling cutter and with an extremely high chip volume thanks to our “5-axis helical drilling” strategy.



The advantages are plain to see

- Fast and efficient plunging
- Simple programming
- Gentle on tools
- Also suitable for milling tools that are not center cutting
- Fewer tool changes

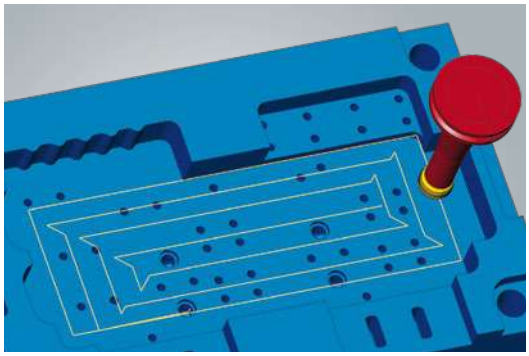
Milling with barrel cutters

*hyper*MILL® offers you strategies for finishing planar and arbitrarily curved surfaces as well as prismatic fillets. Intelligent automated functions ensure optimum tool inclination.

Scan this for more information and exciting content

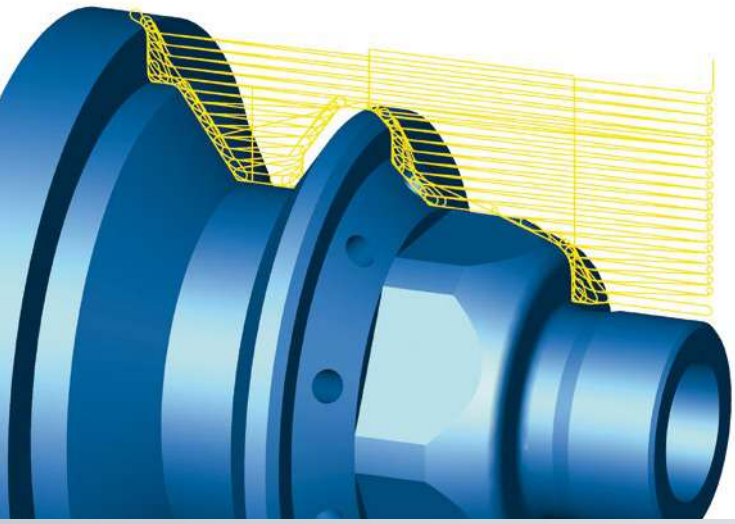
Roughing

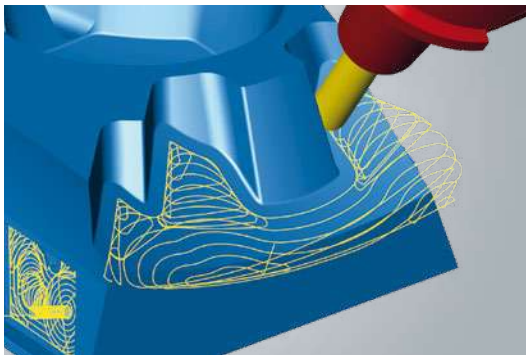
Our roughing strategies offer unique solutions to make the best use of high-feed and high-performance tools. What makes them special is that our performance module allows you to use simultaneous roughing for milling and turning operations, thus giving you a technological edge. The bottom line: You can perform roughing operations with time savings of up to 75 percent compared to conventional machining.



High-feed milling
Optimal adaptation of the toolpath layout to the area to be machined and toolpaths optimized for high-feed milling.

High-performance turning
Use trochoidal toolpaths also for turning operations to improve your productivity and process reliability! By using a simultaneous tool axis, our 3-axis simultaneous strategies in HPC mode open up new possibilities for machining demanding geometries.



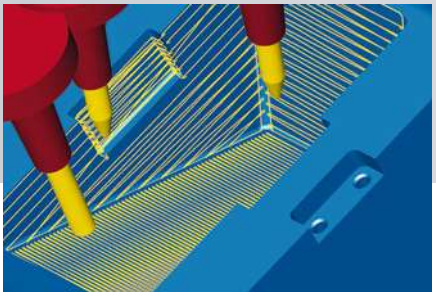


High-performance roughing
Fast machining thanks to high cutting and feedrates for 2D, 3D, and 5-axis machining. Trochoidal toolpaths ensure efficient roughing.

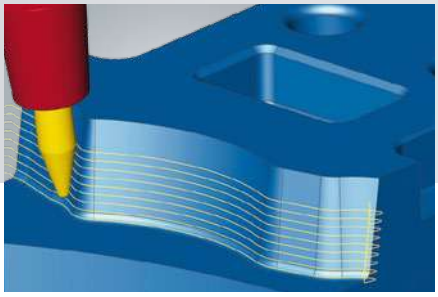
Finishing

We have revolutionized finishing through novel toolpaths that use innovative tool geometries. Thanks to larger cutting radii of the tools and perfect tool guidance, you can thus achieve enormous time savings of up to 90 percent while maintaining the same high quality.

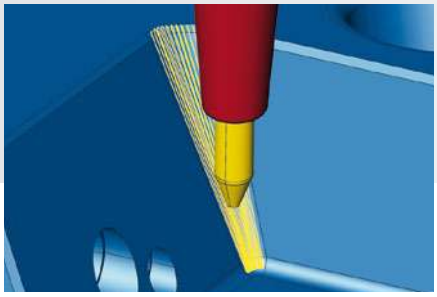
MAXX Machining
Up to 90% time savings



Tangent plane machining
A special strategy for the continuous processing of flat wall and floor surfaces. Automated functions ensure optimal tool inclinations and facilitate simple programming.



Tangent machining
The best strategy for machining surfaces with any continuous curvature. Whether it's single- or multi-surface machining, *hyper*MILL® creates the perfect toolpaths fully automatically.



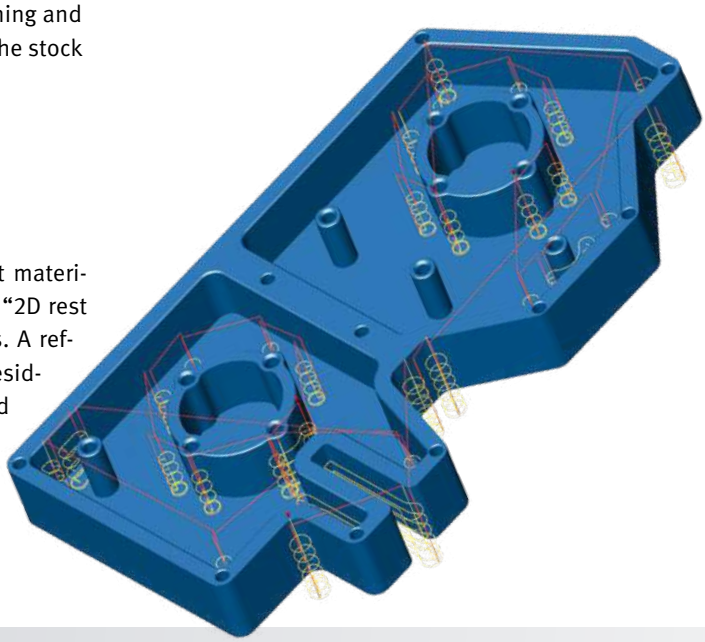
Prismatic fillet finishing
Benefit from the cutting geometry of the barrel cutters and finish fillets in record time! The required inclination and the contact point is calculated automatically.

Rest Material

With *hyper*MILL®, you can reliably and efficiently detect and machine rest material, whether in 2.5D, 3D or 5-axis machining.

Rest material machining without headaches

Rest material can result from various milling operations. For example, this is the case if you use larger tools during roughing or different tools during finishing. *hyper*MILL® offers reliable and effective strategies for roughing and finishing rest material. Area detection is automatic, either based on the stock or on a reference/previous tool.

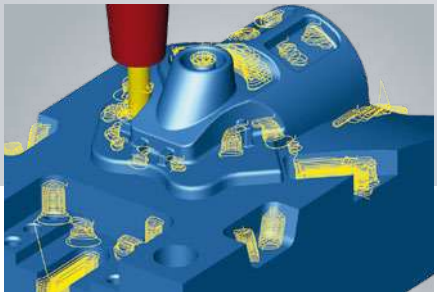


Rest material during 2.5D machining

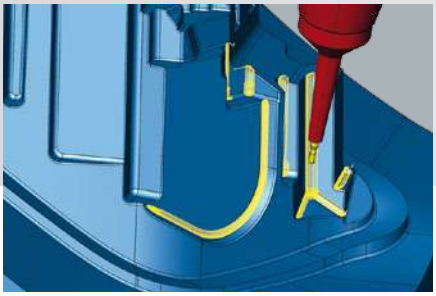
*hyper*MILL® delivers the functions you need to reliably remove rest material during pocket and contour machining. The universally applicable "2D rest machining" strategy automatically detects the corresponding areas. A reference job and a corresponding tool are selected to calculate the residual material. Rest machining can be repeated as often as required using smaller tools until the final component geometry has been achieved.

Rest material during 3D machining

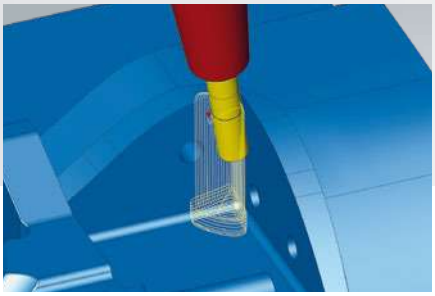
Rest machining of fillets or cavities in particular can be very demanding. Various 3-axis and 5-axis strategies in *hyper*MILL® ensure efficient and safe machining of rest material. The areas to be machined are reliably detected based on the stock or after specifying a reference tool. Our strategies can be used flexibly and in a variety of ways on 3-axis and 5-axis machines. Optimized toolpaths for fillets as well as fully automatic approach calculation during 5-axis machining translate into user-friendly programming.



3D-optimized roughing for efficient rest material roughing



3D-automated rest machining for homogeneous toolpaths



5-axis corner rest machining for efficient corner machining

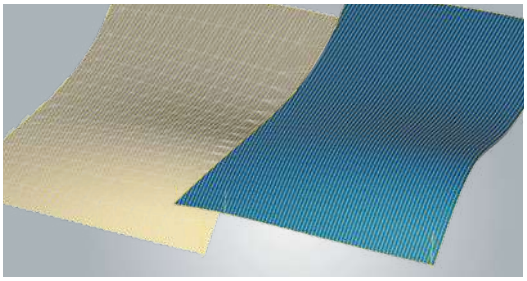
High-Precision Machining

High-precision machining stands for a high level of milling precision, outstanding surfaces, and perfect milling results.

Save yourself unnecessary polishing work

Secondary processes like polishing or grinding are often required to produce precise components with pristine surfaces. *hyper*MILL® offers special integrated functions for surface machining that enable efficient and safe production of very high surface qualities and reduces the need for secondary processes.

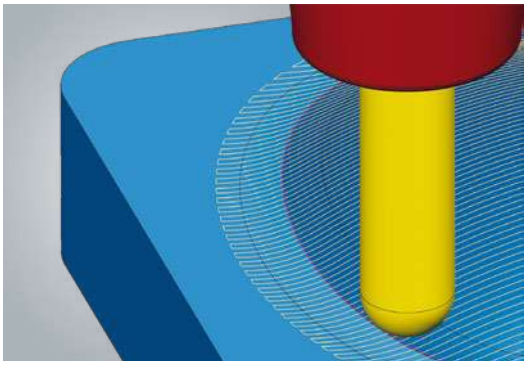
Scan the QR code and discover more about high-precision machining



Faceted calculation model **Surface model**

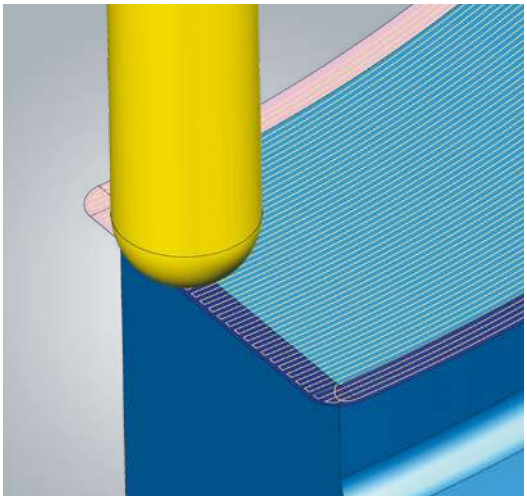
Perfect surfaces

In the “High precision surface mode”, toolpaths are calculated directly on the CAD surfaces to ensure highly accurate machining. The machining tolerance can be controlled down to the micrometer range, and the distribution of the NC points is optimally adjusted to achieve a homogeneous milling pattern.



Flawless transitions

Efficient milling often requires subdividing components into different areas to allow for machining with different tools and setups. The “Smooth overlap” function improves the surface quality in transition areas, resulting in nearly imperceptible transitions.

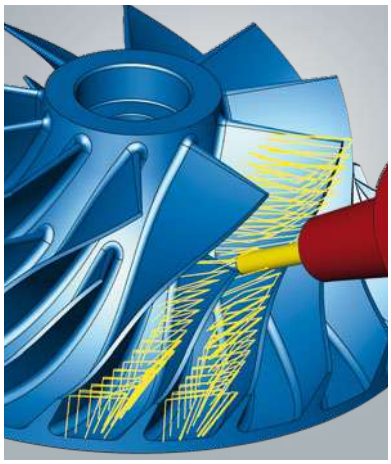


Precisely milled component edges

The “Automatic surface extension” feature protects component edges and allows complete machining of surfaces without prior modification of the CAD model. This is accomplished by automatically extending the periphery of the selected milling surfaces and generating the toolpaths accordingly.

Impellers and Blisks

*hyper*MILL® offers you special strategies for rotors and stators with multiple blade geometries, such as those found in compressors, turbines or pumps. Integrated automated features and CAD functions enable even non-specialist users to create programs with ease.



Roughing

*hyper*MILL® offers two special strategies for material removal from a stock. In addition to conventional roughing, plunge roughing is an alternative roughing method that allows you to cut along the cutter axis.

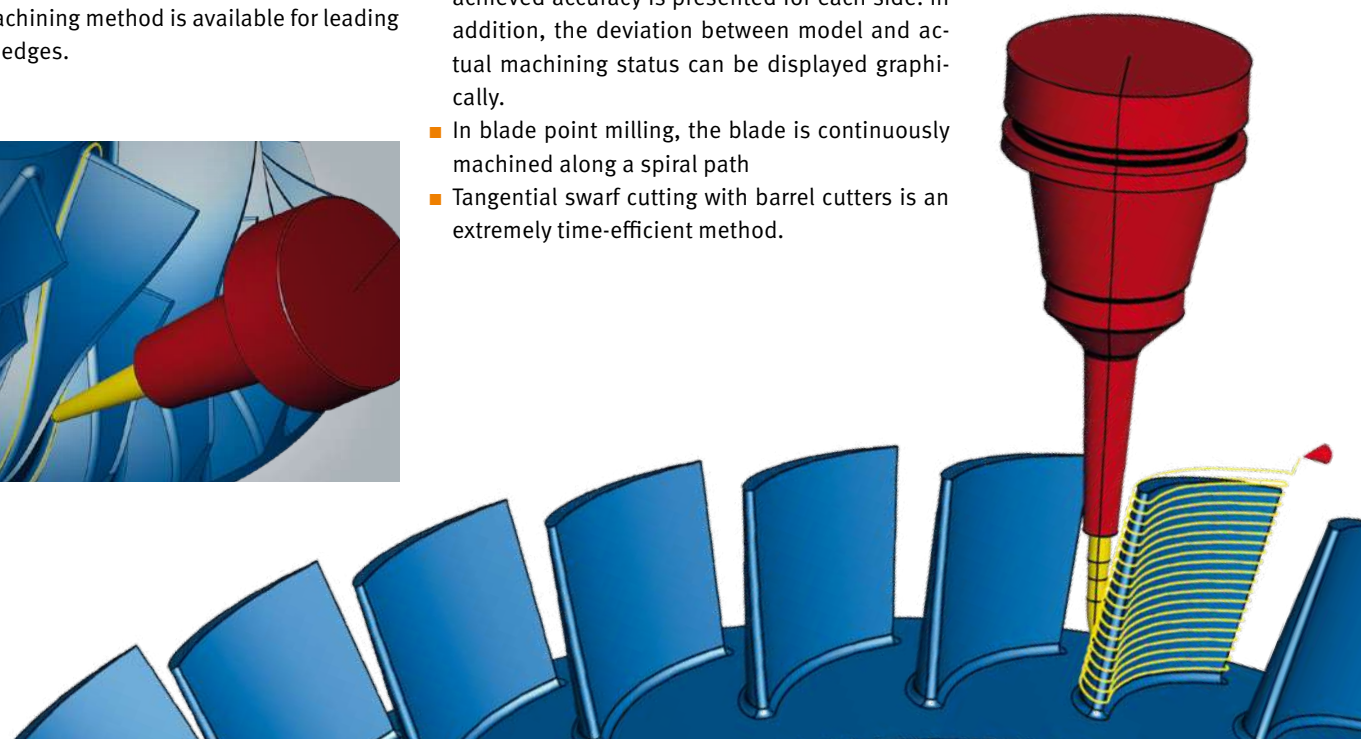
Edge and hub machining

Various strategy parameters allow you to optimize the processing of hub surfaces. Tools for blade and hub machining can be selected independently of the transition radius. The remaining rest material is removed during fillet machining. In addition, a separate machining method is available for leading and trailing edges.

Blade finishing

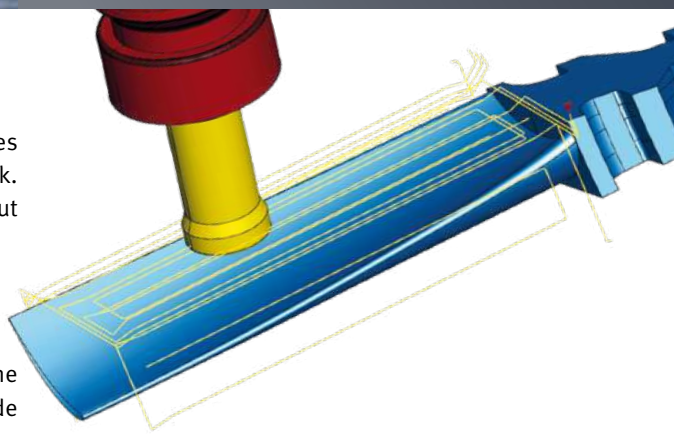
Depending on the requirements and the tool, three methods are available for finishing blades:

- The best possible tool contact is calculated automatically when using blade flank machining. The achieved accuracy is presented for each side. In addition, the deviation between model and actual machining status can be displayed graphically.
- In blade point milling, the blade is continuously machined along a spiral path
- Tangential swarf cutting with barrel cutters is an extremely time-efficient method.



Turbine Blades

The turbine blade module features milling strategies that have been specially optimized for the complete machining of blades. Automated features and intuitive operation ensure short programming times.

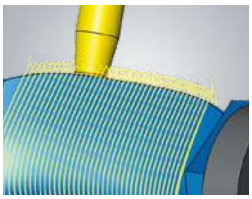


Optimized roughing

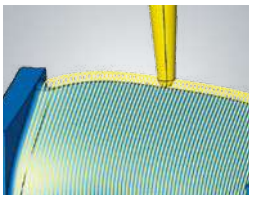
Optimized toolpaths ensure efficient and reliable roughing. Turbine blades are machined in various tool inclinations based on a freely definable stock. For even greater efficiency, this strategy helps avoid idle paths in undercut areas.

Finishing

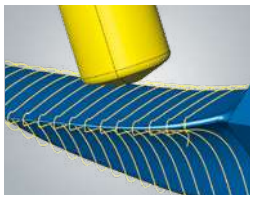
*hyper*MILL® offers you a selection of proven strategies for finishing turbine blades. These also account for the transitions between the blade and side surfaces of the shroud and/or hub. Tight form tolerances and an excellent appearance are guaranteed when machining with radius cutters. A special highlight is the easy programming and time-saving machining using conical barrel cutters.



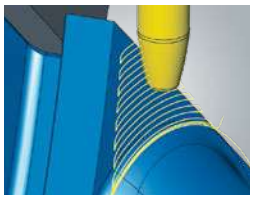
Finishing with bullnose endmills



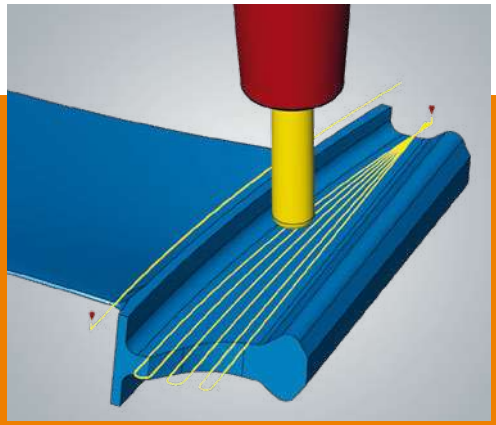
Point-contact finishing



Top milling with barrel cutters



Platform machining with barrel cutters



Versatile

*hyper*MILL® puts a wide range of machining strategies at your disposal that are ideal for handling various turbine blade geometries. Special tools are also supported in detail, for example, to produce dovetail or fir tree geometries. Thanks to the flexibility of our strategy, the manufacturing range can even be expanded to include other parts of turbo-machines, either for new production or for component repairs.

Automation made easy

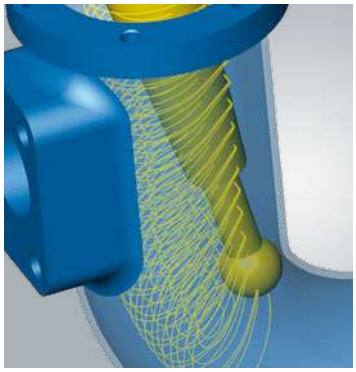
Turbine blade programming can also be completely automated with *hyper*MILL®, using feature technology to define key machining elements.

Tubes

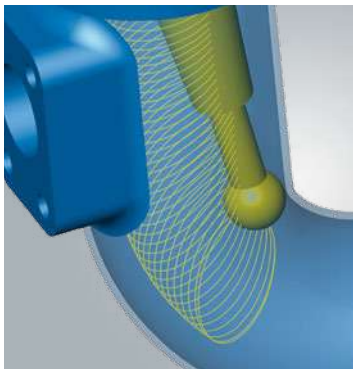
One package, many applications: Whether intake and exhaust ducts of engines, inlets and outlets of pumps and compressors, or passages of shrouded impellers – use it to program even highly undercut flow ducts conveniently and safely.

Perfectly coordinated CAM strategies for complete machining

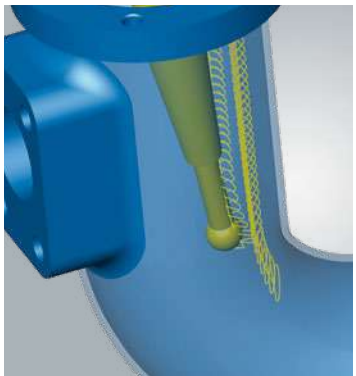
The tube module includes strategies for roughing, rest machining, finishing and milling of all types of channels. The strategies have been optimized for 3+2 and 5-axis simultaneous machining and for the special technological challenges involved in machining these geometries. For example, woodruff cutters are supported for finishing. Defining the machining is intuitive and straightforward, and the proven collision checking guarantees safe machining.



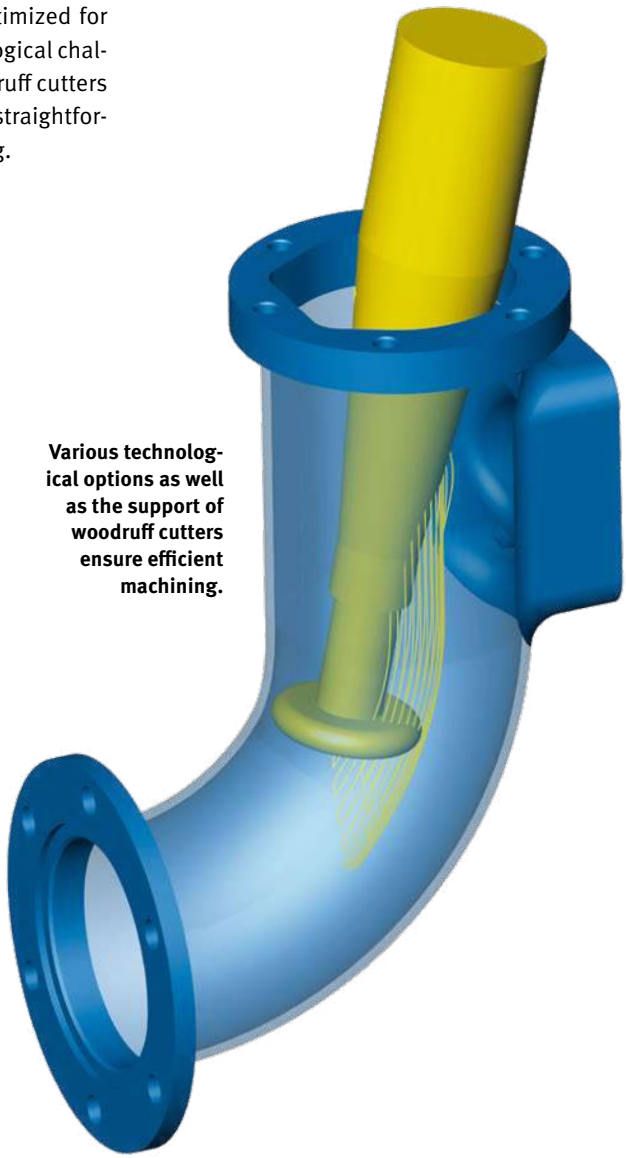
The tube is milled from the solid in a continuous machining operation.



Seamless, spiral toolpaths deliver high-quality surfaces.



Rest machining along a reference takes place in a spiral pattern or in the direction of flow. This is also advantageous for angular cross-sections.



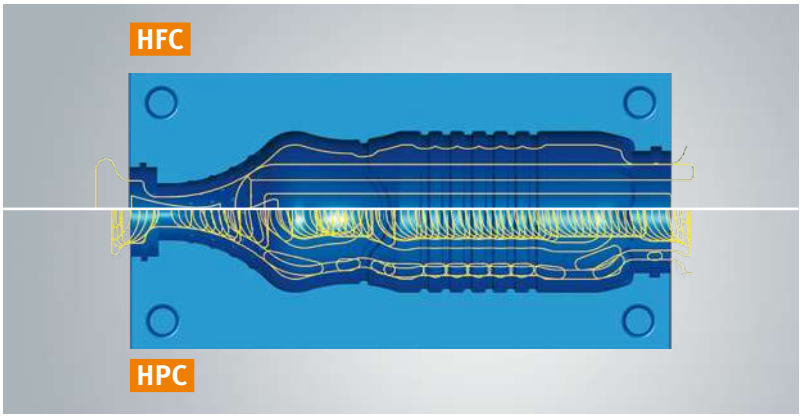
Various technological options as well as the support of woodruff cutters ensure efficient machining.

Blow Molds

*hyper*MILL® offers special, high-performance blow mold machining strategies. These enable you to produce components in superior quality with flawless high-gloss surfaces.

Accelerated roughing

Rely on *hyper*MILL® roughing strategies that are as simple as they are effective. Depending on the tool type, you can draw on high-performance HFC or HPC strategies. This means that you can always adapt the machining operation perfectly to the characteristics of your components.



Watch the video to witness the creation of perfect surfaces.

Finishing in high-gloss quality

5-axis radial machining is available especially for the machining of blow molds. This finishing strategy uses a radial projection method to quickly calculate the necessary toolpaths based on the CAD surfaces. The 5-axis inclination calculation is designed to machine the component with as few simultaneous movements as possible. This approach is the only way to achieve perfect surface quality.

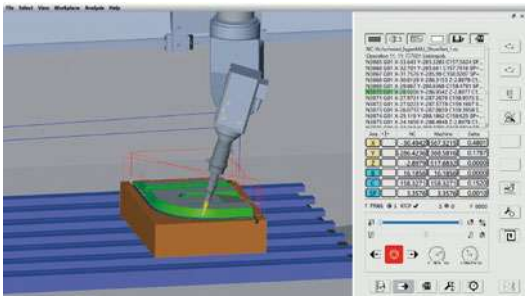
> “With 5-axis radial machining, we have developed a unique solution that easily meets the daunting demands of the blow molding industry in terms of surface quality and accuracy.”
>
> **Stefan Jacobs, Product Manager Tool and Mold Making, OPEN MIND Technologies AG**

KNIFE Cutting

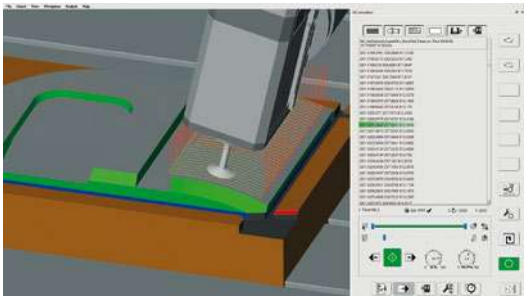
*hyper*MILL® KNIFE Cutting is a comprehensive CAM solution for ultrasonic cutting with oscillating tangential cutting blades.

Dedicated ultrasonic cutting solution

The technical challenges and approaches in ultrasonic cutting are manifold. *hyper*MILL® offers an extensive toolbox of programming technologies that help you safely implement the various applications. Our NC Optimizer automatically controls the correct orientation of the cutting blade via the sixth spindle axis. It also guarantees optimal machining within the machine limits for machines with limited rotation axes. Hazardous rotations and retract movements are prevented. When used together with proven milling strategies, the advantages of both technologies can be combined via a single user interface, such as when using woodruff cutters.



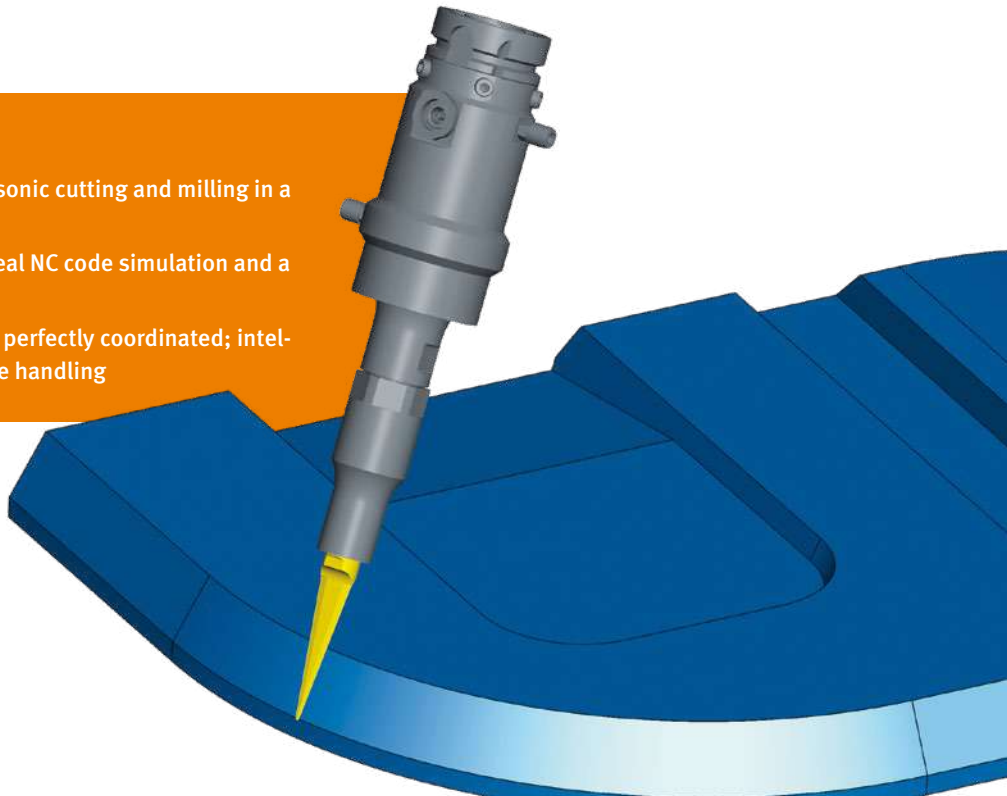
Ultrasonic cutting in the virtual machine



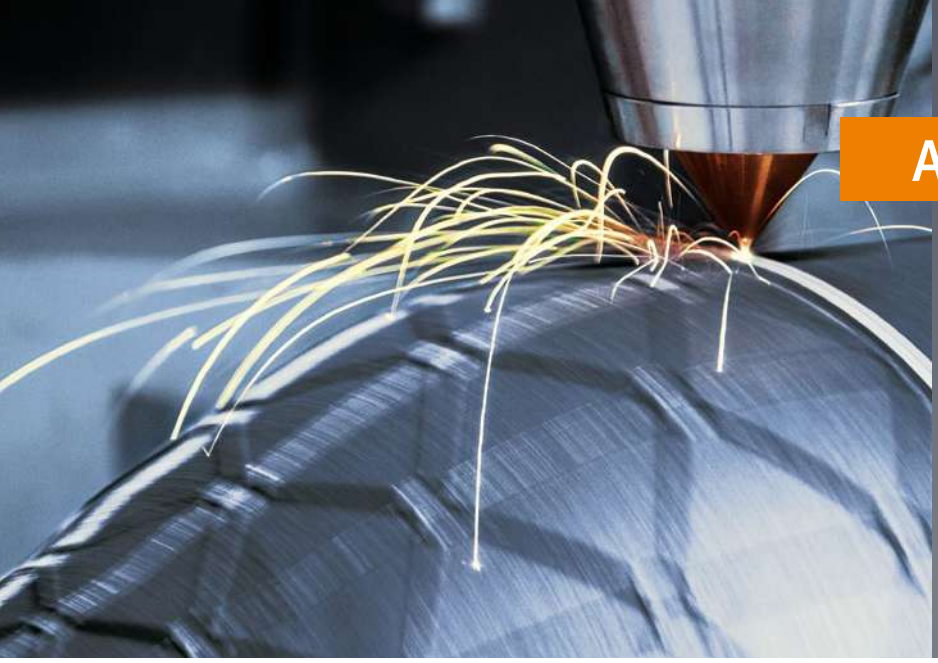
Perfect supplement thanks to proven milling strategies

*hyper*MILL® KNIFE Cutting at a glance

- Complete machining: for programming ultrasonic cutting and milling in a single user interface
- Reliable and efficient processes: thanks to real NC code simulation and a digital twin of the machine
- Convenient user interface: CAM and CAD are perfectly coordinated; intelligent automated functions facilitate intuitive handling



Scan this for more information on *hyper*MILL® KNIFE Cutting

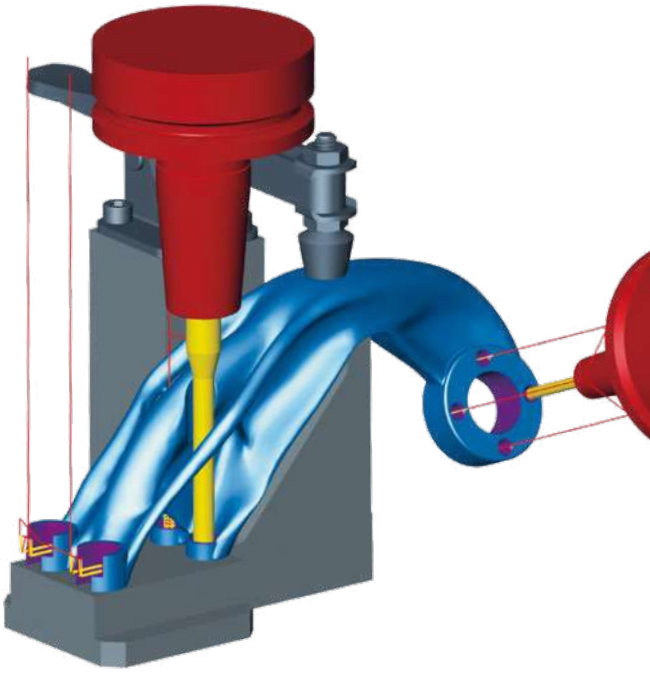


Additive Manufacturing

*hyper*MILL® ADDITIVE Manufacturing is a powerful solution for hybrid manufacturing processes. It ensures the precise control of both additive and subtractive processes.

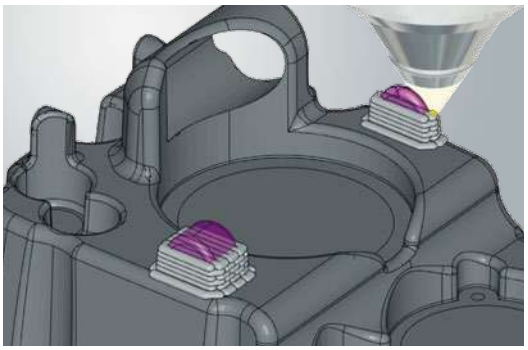
Additive manufacturing – It's only truly perfect with CAD/CAM

Printed components produced using powder bed technology can be transformed into true precision components using our machining and measurement strategies. When it comes to direct material application, *hyper*MILL® stands out with 5-axis simultaneous technology, offering unmatched flexibility with regard to additive application processes.



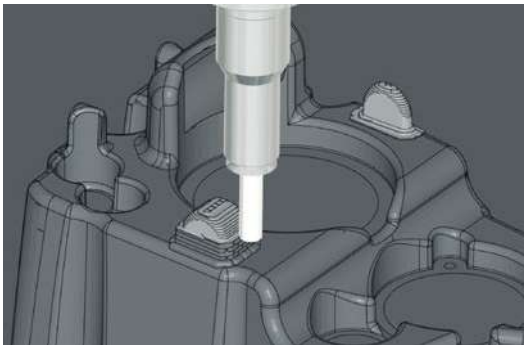
Rework machining with *hyper*MILL®

Thanks to its rich CAD and CAM functionalities, *hyper*MILL® is a powerful solution for the precise rework machining of 3D-printed components. Component alignment on the CNC machine in particular, which poses a great challenge to most users, is a quick, precise and reliable affair with *hyper*MILL® BEST FIT. Rework machining becomes a breeze thanks to the extensive CAM strategies for 2.5D, 3D and 5-axis applications.



Directed Energy Deposition (DED)

For optimal results and maximum flexibility, *hyper*MILL® controls the material application based on 5-axis simultaneous machining. Different processes, such as DED or Wire Arc Additive Manufacturing (WAAM) are supported for different machine types: pure additive machines, hybrid machining centers or industrial robots. A specially developed machining strategy ensures maximum flexibility across a wide range of machining tasks. All machining processes can be simulated based on the NC code. Thanks to hybrid stock tracking, additive and subtractive processes including material application can be visualized.

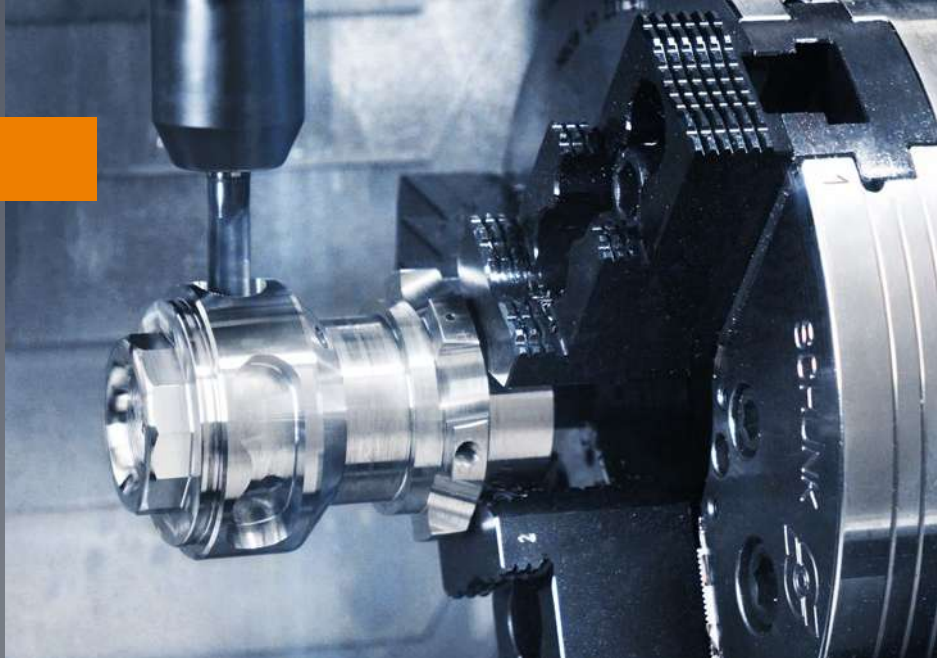


Hybrid machining: additive and subtractive machining with hybrid stock tracking

Further information and exciting content on additive manufacturing can be found here

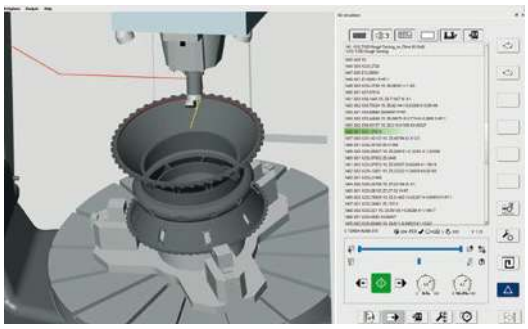
TURNING Solutions

Turning operations of all kinds are at the core of today's manufacturing industry. From turning on machines with only one turret to machining on complex multitasking machines, all the way to mill/turn machining on milling centers: the world of turning is multi-faceted and places particular demands on the CAM system.



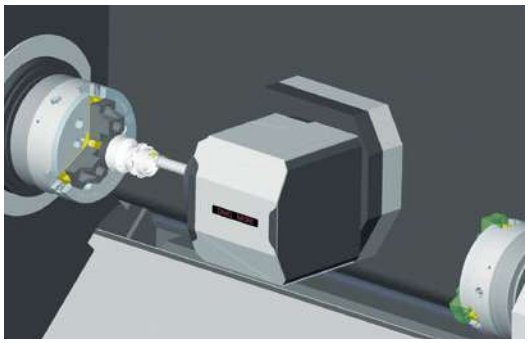
*hyper*MILL® MILL-TURN Machining

Mill-turning is ideal for rotationally symmetrical milled parts. In *hyper*MILL®, milling and turning are closely intermeshed, enabling intuitive operation and high-quality toolpaths. Since typical components are often large, complex and expensive, it's important to get everything right the first time. A safe CAM system with reliable collision avoidance is essential for this. This is where *hyper*MILL® VIRTUAL Machining enters the stage, automatically generating and optimizing the NC code. Collision checking, simulation and analysis are based on it, giving you reliable information on exactly what will happen on the actual machine.



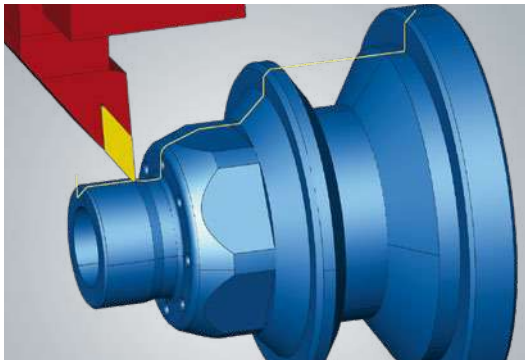
*hyper*MILL® TURN-MILL Machining

Modern turn-mill machines are indispensable in today's manufacturing arena. Complete machining on a single machine is efficient, precise and flexible. This is why you should use proven CAM strategies for turning, milling and drilling in a user-friendly environment. With *hyper*MILL® you can conveniently program machining operations on machines with main and counter spindles. The component is transferred by means of a transfer job, with or without parting.



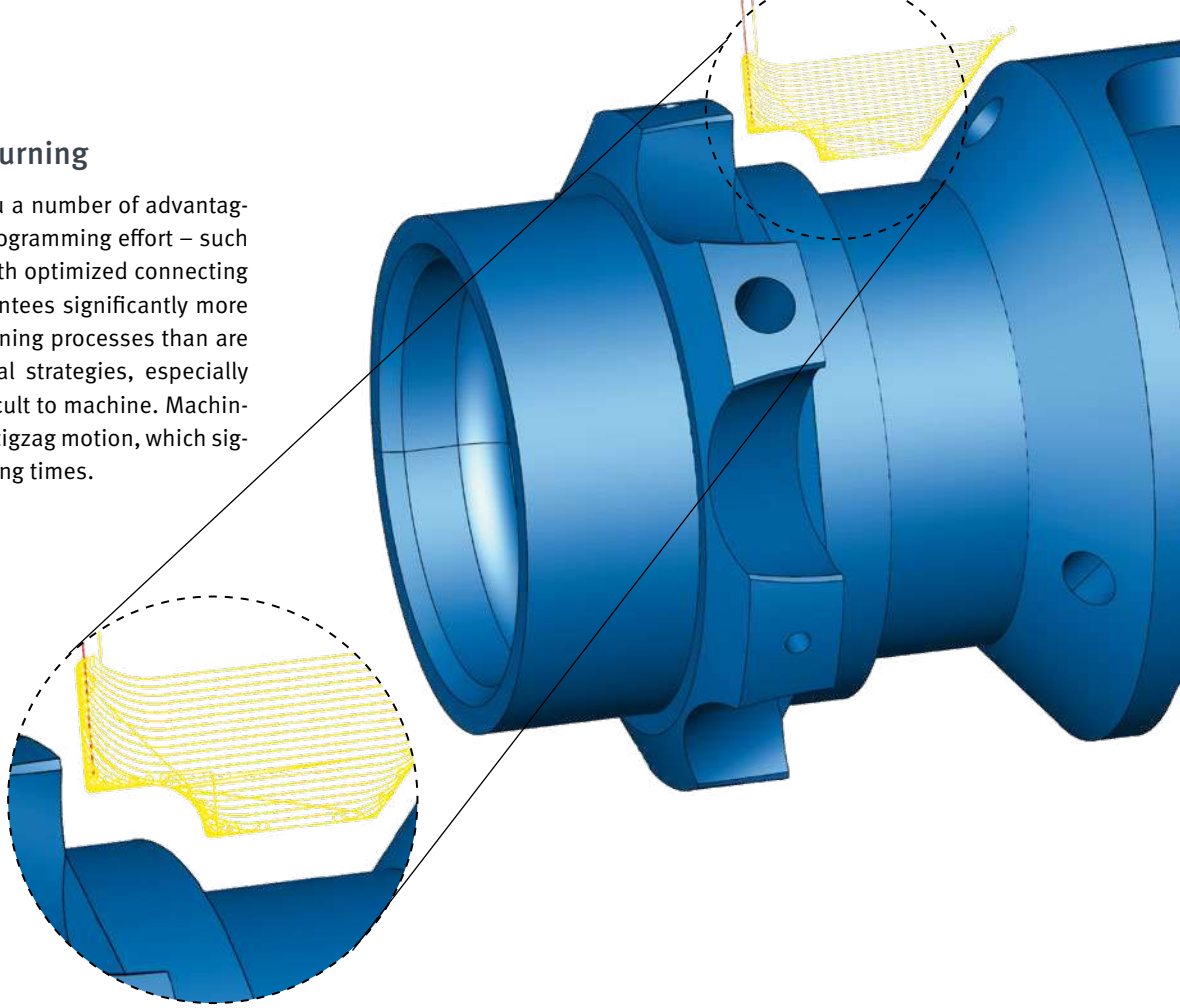
*hyper*MILL® TURNING

Turning includes various operations such as facing, roughing, finishing, grooving and drilling. *hyper*MILL® accounts for the turret with all tools in the workspace to prevent collisions. For driven tools, you can simply use C-X interpolation to react flexibly to axis limits or the absence of linear axes.



High-performance turning

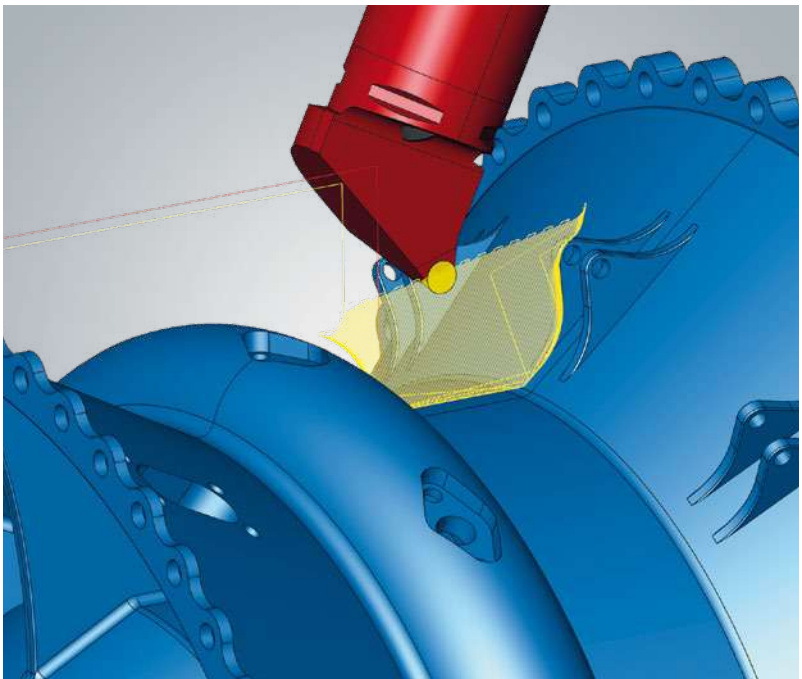
Our HPC turning offers you a number of advantages – without additional programming effort – such as trochoidal toolpaths with optimized connecting paths! Our solution guarantees significantly more stable and efficient machining processes than are possible with conventional strategies, especially for materials that are difficult to machine. Machining can be performed in a zigzag motion, which significantly reduces machining times.



Experience *hyper*MILL® TURNING Solutions on our website

***hyper*MILL® TURNING Solutions at a glance**

- An intuitive programming environment for turning and milling tasks
- A broad spectrum of available turning and milling strategies for flexibly programming 2.5D tasks up to complex 5-axis jobs
- A common tool database for turning, milling and drilling tools
- Simple tool definition with the *hyper*MILL® TOOL Builder
- Use the *hyper*MILL® VIRTUAL Machining technology to generate, simulate and optimize the NC code based on the digital twin.
- Time-saving, automated programming thanks to feature and macro technology and the *hyper*MILL® AUTOMATION Center

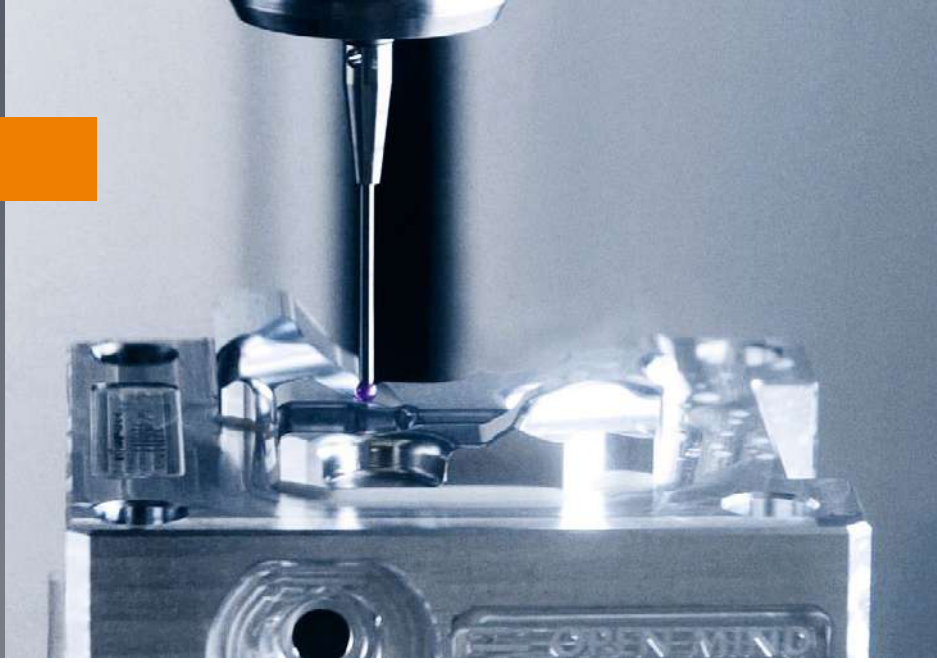


Easily program 3-axis simultaneous turning

In order to optimally machine components, simultaneous machining is often the best solution. *hyper*MILL® helps you to generate simultaneous toolpaths safely and conveniently for this type of machining. You can choose from two strategies for 3-axis simultaneous roughing and finishing. This opens up new possibilities for machining undercuts as well as complex geometries. For even better performance, simultaneous roughing can also be combined with the HPC option.

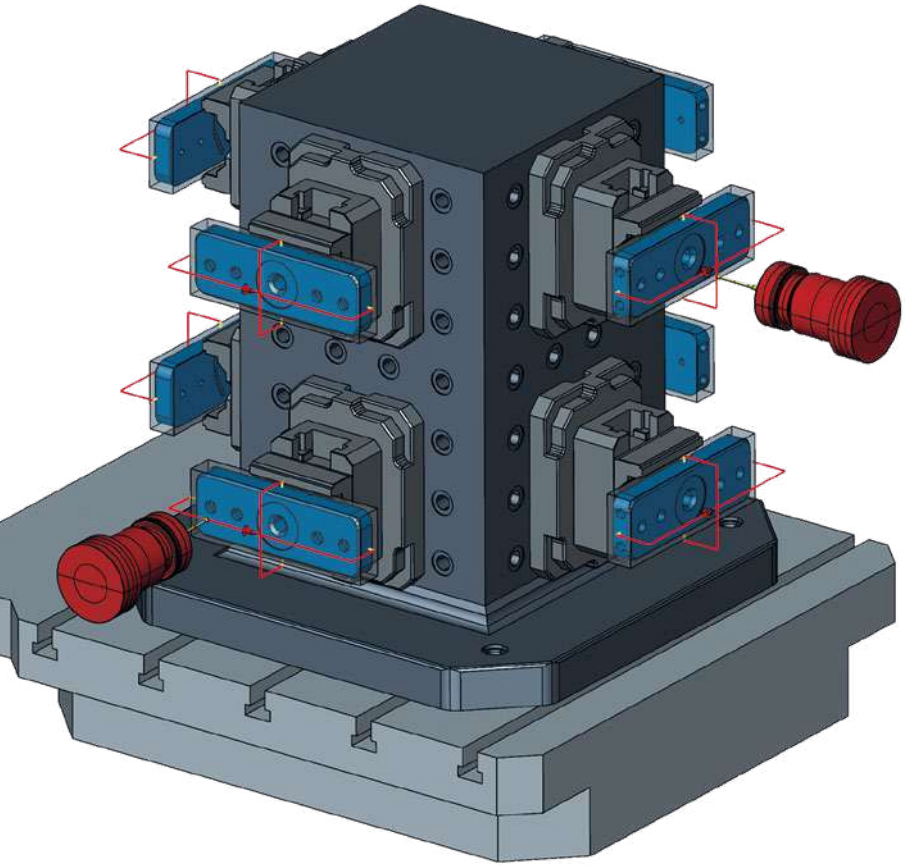
PROBING

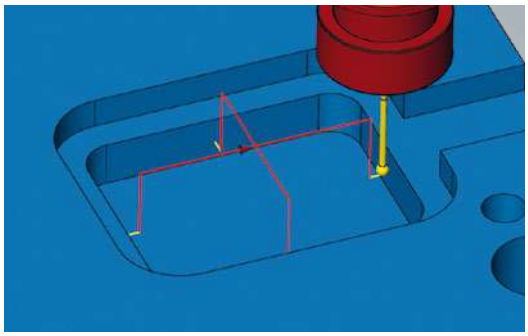
*hyper*MILL® PROBING is the CAM solution for programming your measuring and inspection operations directly on the machine tool. This reduces throughput times and at the same time ensures top component quality.



Before milling: workpiece setup

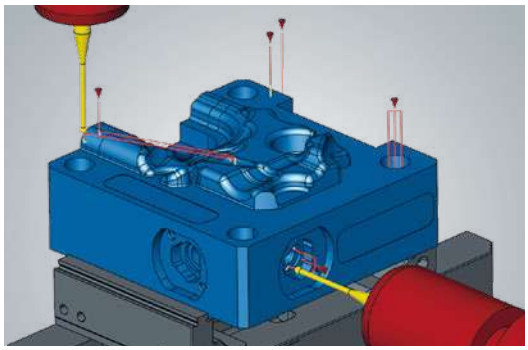
Workpieces can be easily probed to align them precisely with the machine axis. The clamping device position or stock dimensions can also be checked. Define the component's zero-point safely and quickly, even indexed when using a 5-axis machine.





During milling: measuring and adjusting

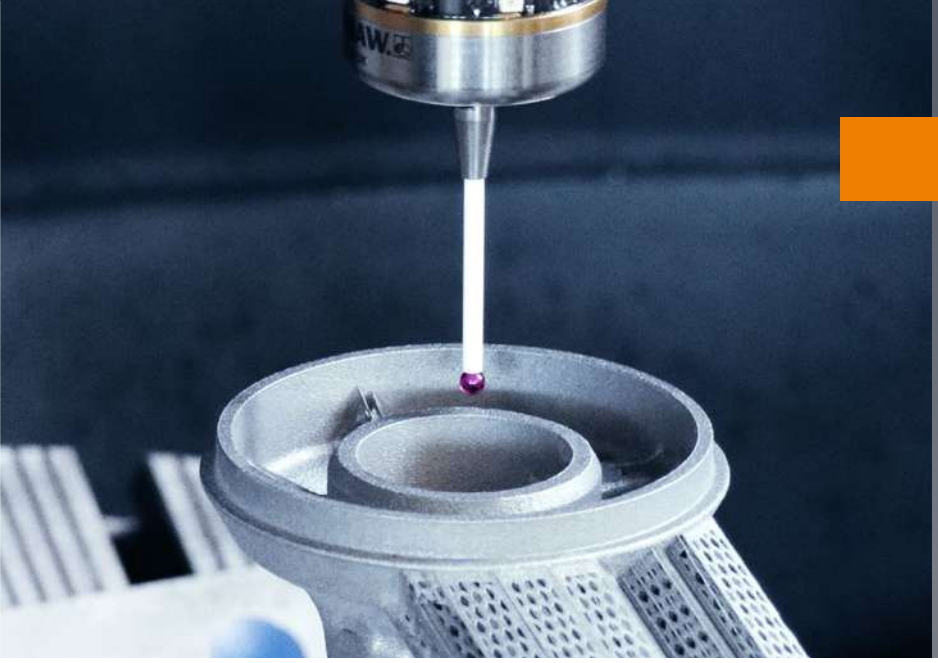
Internal process measuring during the NC machining stage makes it possible to detect and respond to manufacturing errors early on, for example, if the dimensional accuracy is found to be lacking after roughing or semi-finishing.



After milling: quality control

The finished, machined workpiece is compared with the CAD geometry in a target/actual comparison. You can already measure many features in the original setup on the machine tool, which does away with an additional work step on the measuring machine. The probing points can also be fed back into *hyper*MILL® to check for deviations and display them in a table.

Discover the vast world of measuring with *hyper*MILL®



BEST FIT

Are you familiar with the problem? You spend a lot of time aligning your stock or component on the machine, and, in the end, your finished component does not fit. We now have a solution for this that is as simple as it is effective!

Part alignment with *hyper*MILL® BEST FIT – fast, safe, precise

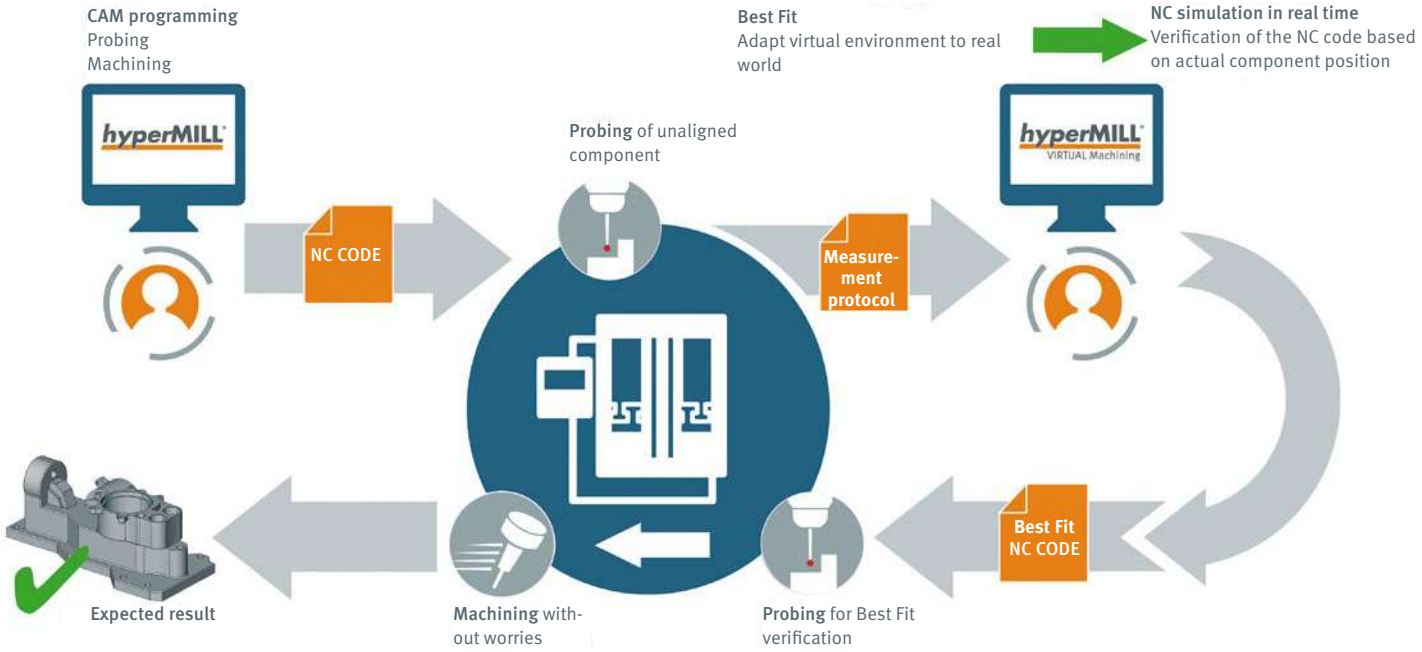
*hyper*MILL® BEST FIT delivers intelligent component alignment at the touch of a button. The unaligned component is probed on the machine using 3D probing, and the probing points are sent back to the CAM system as a measurement log. *hyper*MILL® BEST FIT then precisely adjusts the NC code to the actual component position. In this manner, the virtual world (programming) is adapted to the real world (clamping), and not the other way around! The adapted NC code is then simulated in the virtual machine based on the actual clamping setup, and automatically optimized.

*hyper*MILL® BEST FIT, explained in 60 seconds

Versatile range of applications

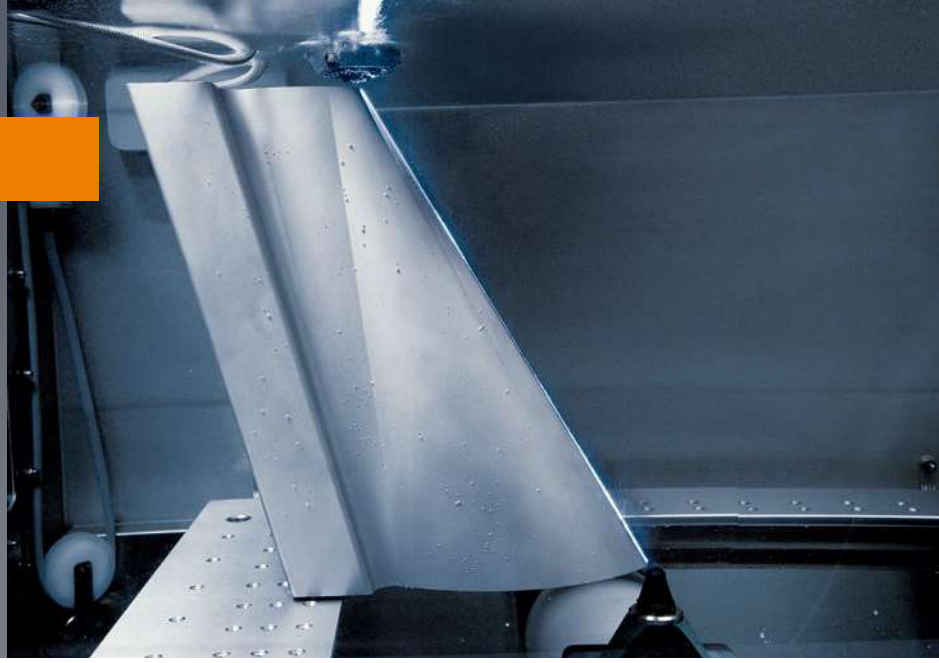
When it comes to cast components, forged components and additive components with imprecise geometries, *hyper*MILL® BEST FIT is a gamechanger. And *hyper*MILL® BEST FIT also plays a major role in secondary clampings or repair jobs. It improves production precision, quality and efficiency and thus makes a decisive contribution to increasing productivity.

BEST FIT Process



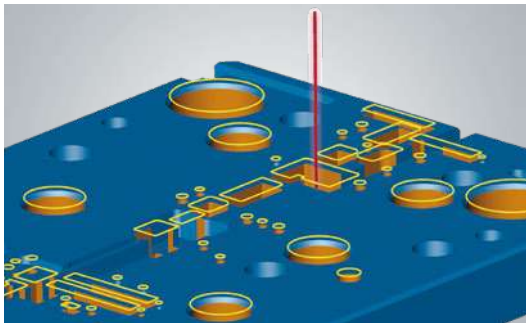
Wire EDM

The OPTICAM wire-cutting module for efficient, flexible programming and simulation of wire electrical discharge machines with two to four axes, is fully integrated in *hyper*MILL®.



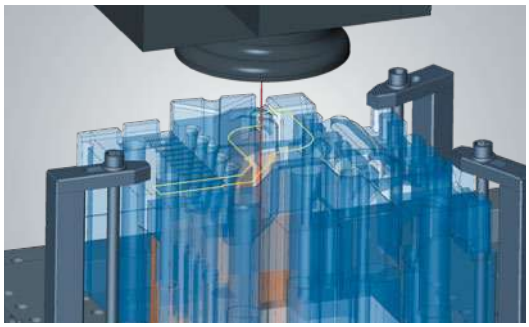
Proven solution for wire EDM

OPTICAM is a convenient, highly user-friendly CAM software tool that allows you to operate wire EDM machines efficiently and safely. It has extensive functions and draws on technology databases from all major manufacturers. Up-to-date postprocessors are crucial for safe and reliable processes.



Feature recognition for automated NC programming

The solution analyzes the components, recognizes wireable geometries and programs their machining features simultaneously. The tool paths are visualized and can be manipulated afterwards. Surfaces can be extended if they are too short, and gaps in surfaces are bridged. If you want to erode individual areas or create custom features, you can also select surfaces or edges manually.



Maximum safety thanks to integrated simulation

We added a 3D simulation with material removal to ensure that the toolpaths are checked reliably. The tool displays clamping devices and machine heads in addition to offsetting. Reliably create NC programs for wire EDM machining using technology databases from all major manufacturers and up-to-date postprocessors.

Certified solution

The OPTICAM solution is a product certified for *hyper*MILL®. It meets all requirements in terms of integration, reliability and usability.

Scan this for more information on OPTICAM

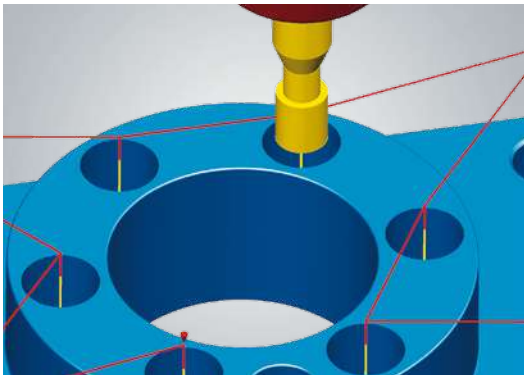
© Photo: Röders GmbH

JIG Grinding

Milling, drilling and jig grinding with a single CAM software: *hyper*MILL® JIG Grinding simplifies programming and accelerates your manufacturing processes by perfectly interconnecting different technologies.

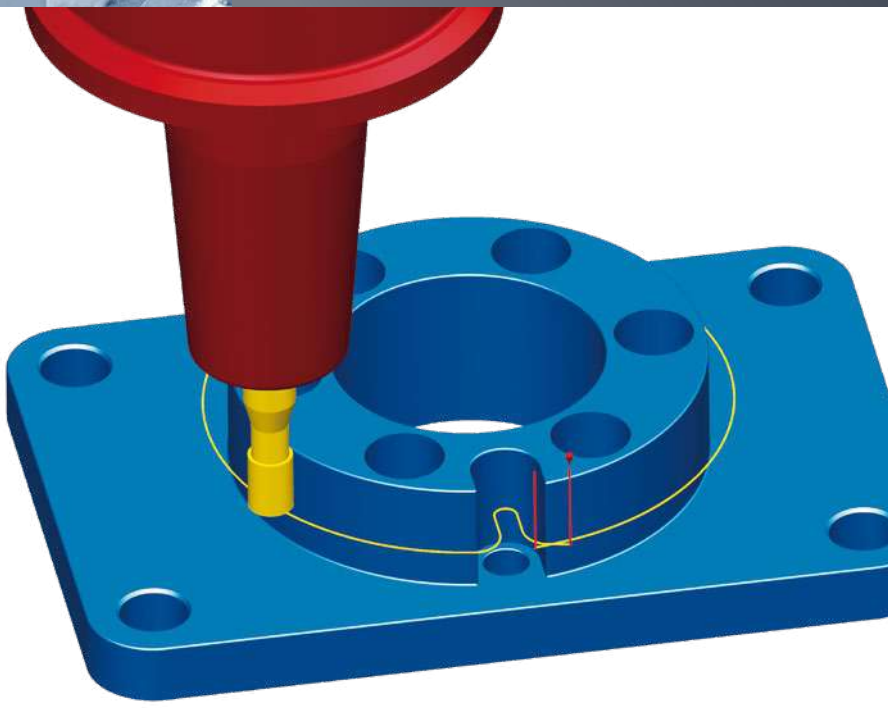
Dedicated jig grinding solution

*hyper*MILL® enables you to generate NC programs quickly and safely for vertical or conical speed chop grinding. The solution makes active use of the control cycle of the grinding machine or hybrid machine. All machining parameters are stored in *hyper*MILL® and are fed into the NC programming process. To check the quality, you can perform probing measurements directly on the machine using *hyper*MILL® PROBING. This allows you to manufacture components with incredibly tight machining tolerances.



Hole grinding

Hole grinding is conveniently programmed in the same way as a standard hole. *hyper*MILL®'s feature and macro technology automatically detect the holes to be ground. This allows you to program in record time thanks to highly convenient programming.



2D contour grinding on a 3D model

Simple and reliable workpiece machining along a contour using 2D contour grinding: After you select the contours to be machined, *hyper*MILL® automatically generates collision-checked toolpaths. Tool holders as well as mounting points of all kinds are represented accurately.

***hyper*MILL® JIG Grinding at a glance**

- Everything in a single user interface: Drilling, milling, grinding and other technologies
- Easy to program
- Excellent surfaces
- Extremely high degree of precision
- Optional CAM probing module for quality assurance

TECHNOLOGY

32–41

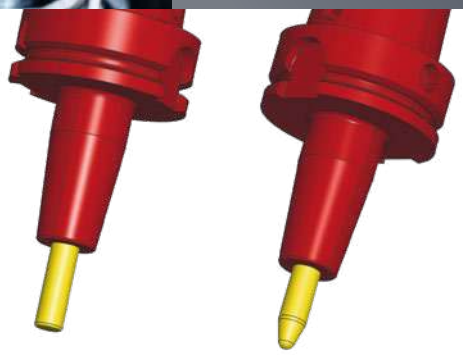
Our technologies are packed with innovation and a deep understanding of manufacturing processes. Gain a decisive technological edge with our intelligent automation, with VIRTUAL Machining and the various integrations and interfaces!

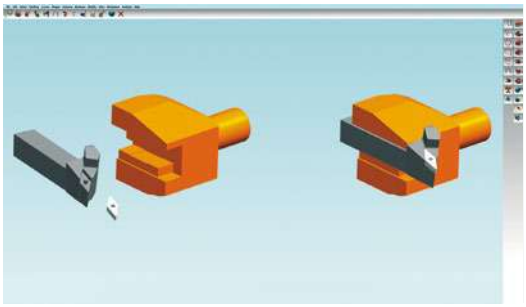
Tool Management

It takes a powerful tool database to perfectly coordinate machines, tools and NC programming.

Always use the right tool

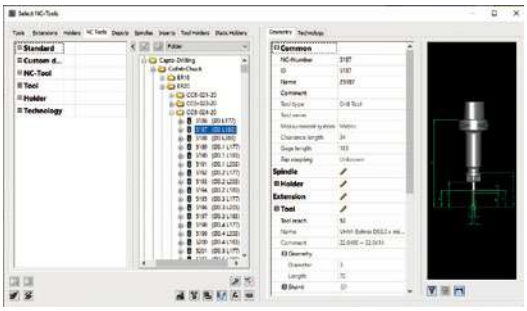
The tool database in *hyper*MILL® enables users to manage tools of all types. From drills, milling cutters and touch probes to complex turning tools – all tools can be mapped virtually in detail and linked with technology data.





Simple connection with the virtual tool

*hyper*MILL® offers interfaces to catalogs of various tool manufacturers. You can alternatively import tool data, 3D data and technology data directly from TDM, ZOLLER TMS, WinTool and NC Simul Tool. Use the *hyper*MILL® TOOL Builder to create tools for NC programming in just a few steps by combining the individual components from the 3D data into a complete tool.



Always the right technology data

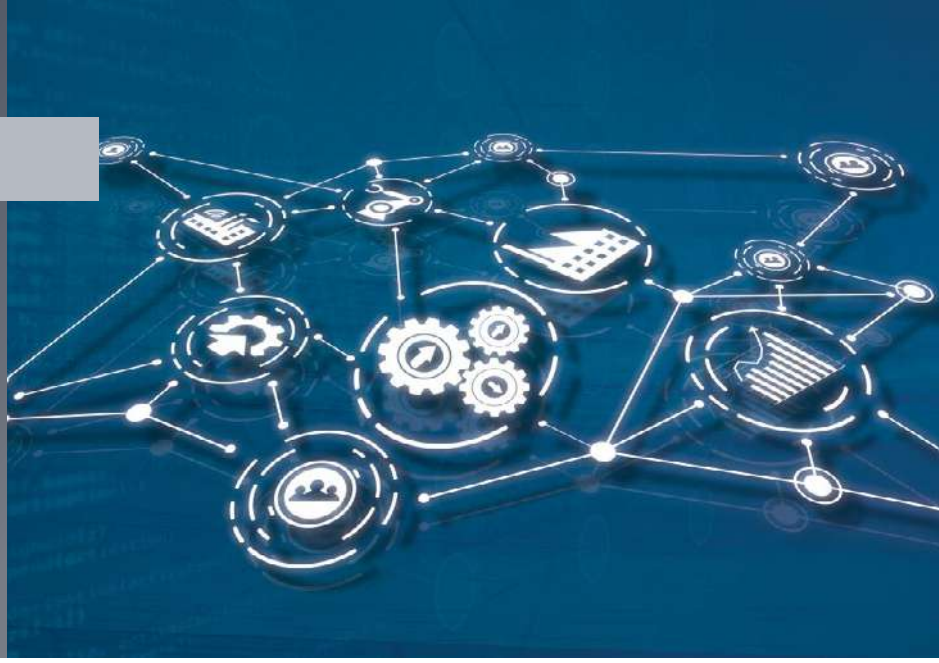
Optimize your machining processes by precisely controlling the speed, feed rate and other technology settings for a wide range of materials and applications. The central database is accessible to every programmer and ensures consistent manufacturing standards. The advantage: Your processes will always be based on available tools and proven, efficient cutting parameters.

Tool database at a glance

- Save time during programming and tool selection
- Optimal processes thanks to reliable technology data
- Central management of tools, holders and technology data
- Digital mapping of tools in the CAM system for the purpose of simulation and collision checking
- Comprehensive interfaces to databases of different tool manufacturers

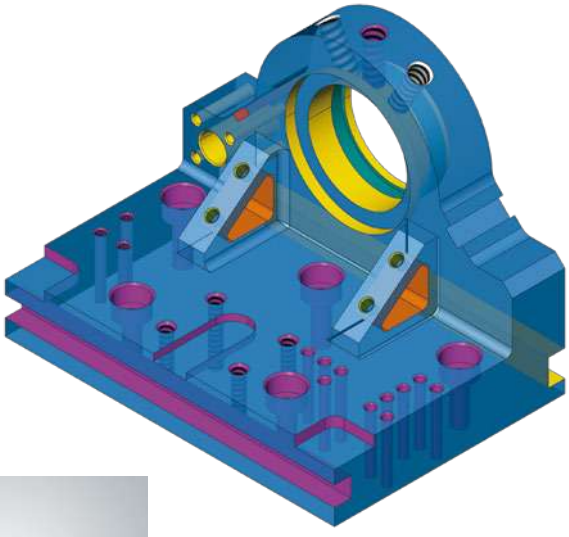
Automation

The automation technology of *hyper*MILL® empowers you to accelerate and standardize your programming processes. This ranges from powerful feature and macro technology to unique functions that allow you to partially or fully automate CAD/CAM processes.

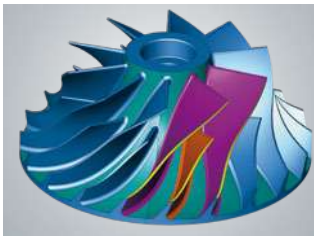


Feature technology from *hyper*MILL®

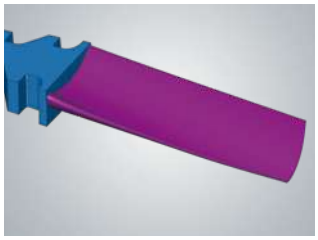
Features are geometric and manufacturing information associated with a CAD model. Frequently recurring elements include holes, pockets and grooves. *hyper*MILL® recognizes these geometries automatically and makes them readily available for programming. Even non-standard geometries, such as freeform surfaces, can be defined in *hyper*MILL® as Customized Process Features (CPF). Reliable recognition and assignment of CAD geometries means that you can significantly speed up your programming workflow.



Customized Process Feature



Impeller features



Turbine blade features

A machining macro knows all the job steps

A macro stores the entire sequence of machining steps and contains all the tool and technology data for feature programming. Using this technology, a large number of different holes can be detected and automatically programmed with just a few clicks, for example. Other repeated machining sequences can be stored in macros too. As a result, you can standardize your machining operations in a very simple way and save a lot of time in NC programming.

*hyper*MILL® AUTOMATION Center Basic

Use the Basic version of our AUTOMATION Center to get started with automated NC programming and automate the basic functions of any programming job. Job lists, stocks and vises are automatically loaded and adapted to the machining task. From feature recognition to NC program generation including job reports, all process steps for the production of prismatic components can be automated.

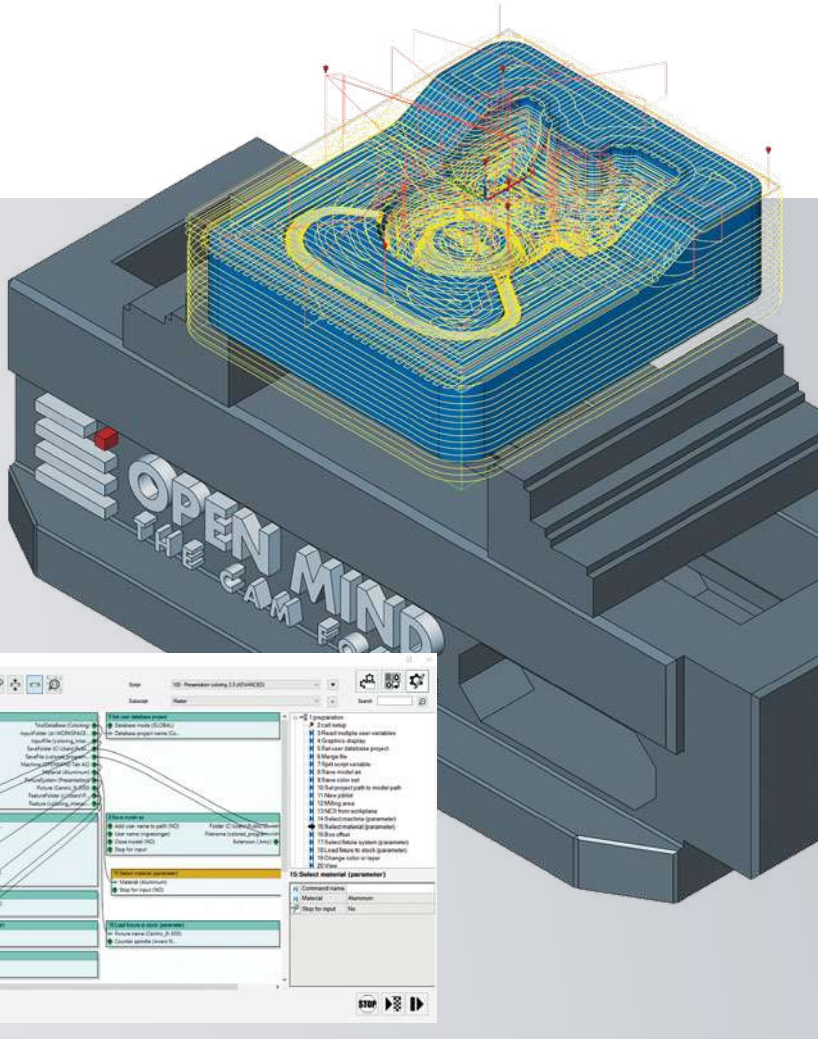
> **“Our low-code *hyper*MILL® AUTOMATION Center solution provides you with all you need to effectively respond to increasing competition and the shortage of skilled workers. This is because process automation can massively increase throughput in NC programming and make consistent use of existing manufacturing know-how.”**
>
> **Hagen Rühlich, Senior Project Manager, OPEN MIND Technologies AG**

Here you will find all relevant information on the subject of CAD/CAM automation

*hyper*MILL® AUTOMATION Center Advanced

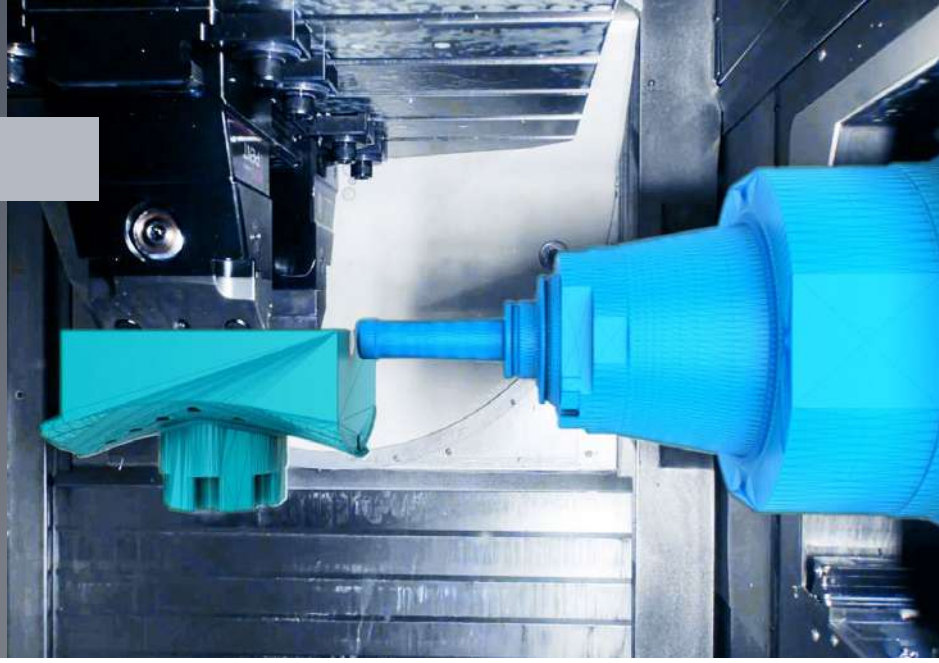
You know your processes best. That’s why we offer you the same development tool that our automation experts use, so you can automate your process flows on your own. Better yet, you do not require any special programming knowledge! Instead, use over 500 template functions to automate your CAD/CAM process steps. Our experts will provide you with all the skills you need to use our technology profitably in your company.

And the great thing about this is that you can standardize and automate all CAD and CAM processes from data preparation and programming to simulation and NC program creation. Thanks to the user-friendly interface and the visualization of underlying structures, even the most complex programming processes remain clear and manageable.



VIRTUAL Machining

*hyper*MILL® VIRTUAL Machining closes the gap between the CAM system and your actual machine environment – providing an unprecedented level of process control and optimization. Welcome to Industry 4.0!



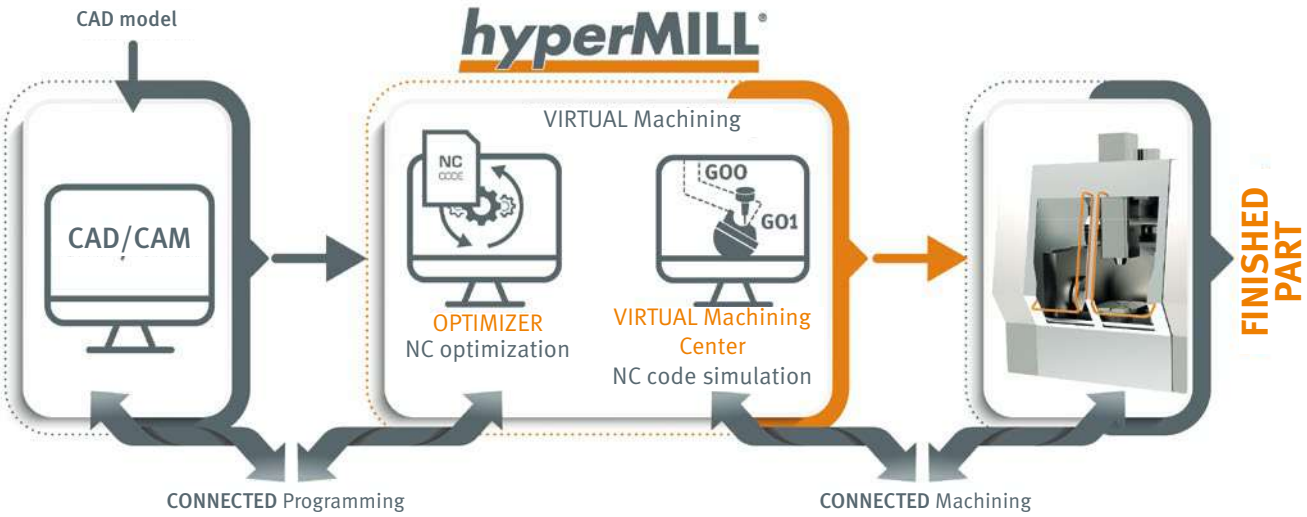
Safely generate, optimize and simulate NC code

The executability and safety of NC programs are decisive factors for successful and process-reliable machining. For OPEN MIND, the development of postprocessors has been a core competence from the very beginning. This has allowed us to develop the optimal solution for each machine and control system.

Discover *hyper*MILL® VIRTUAL Machining on our website

What is *hyper*MILL® VIRTUAL Machining?

*hyper*MILL® VIRTUAL Machining is the state of the art in postprocessor technology. NC code generation and simulation are closely interlinked, guaranteeing unambiguous NC code that is not open to interpretation. Generate, optimize and simulate your NC programs on a completely new level!



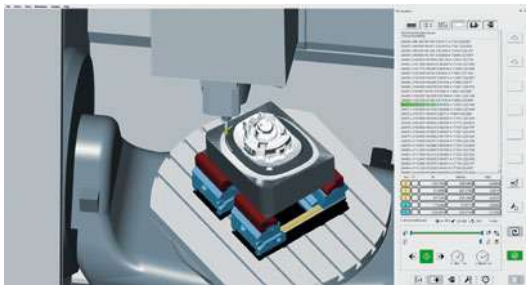
The simulation solution at a glance

- NC code simulation
- Digital twin of the actual machine
- Simulation of all tool and linking paths
- Stock removal simulation
- Comprehensive analysis functions
- Supports milling, turning and additive operations

> “The *hyper*MILL® VIRTUAL Machining Center is key to designing set-up processes in a far more safe and efficient way.”
>
> **Dr. Josef Koch, CTO, OPEN MIND Technologies AG**

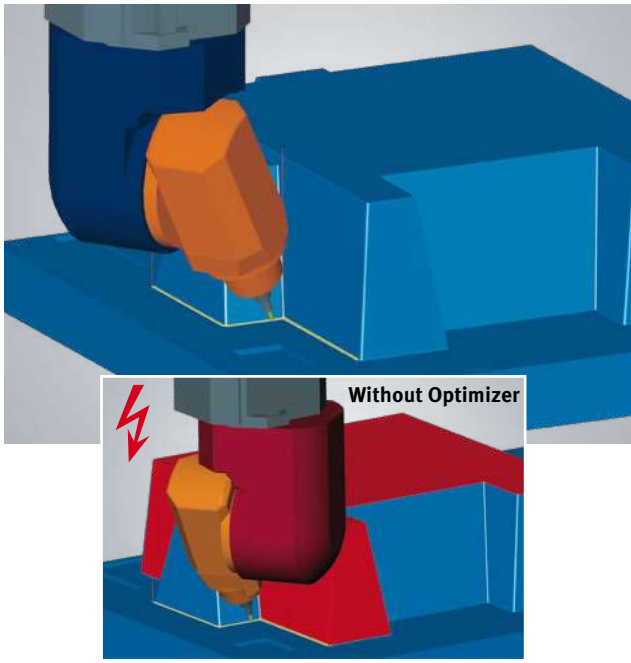
Simulation

Do you want to avoid inefficient operations and costly errors? Simulate and analyze your manufacturing processes with the help of a digital twin of your machine! Our NC code-based simulation solution, which seamlessly integrates with *hyper*MILL®, offers you a completely safe and reliable simulation environment. In addition to simulating NC code, the tool also accounts for all relevant process information from *hyper*MILL® in the simulation. Negative allowances, broken edges or hole parameters are assessed in an unambiguous manner. And this is precisely what you need to avoid the time-consuming evaluation of incorrectly identified collisions.



NC code optimization

The *hyper*MILL® VIRTUAL Machining Optimizer automatically determines the best tool orientation from a technical point of view, optimizes connection movements between individual operations and performs any necessary clearance movements. The Optimizer analyzes the NC program as the NC code is being generated and perfectly adapts it to the kinematic properties of your machine. You benefit from a runtime-optimized NC program and significantly reduced programming effort.

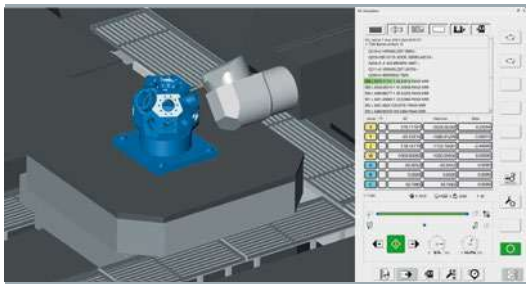


Optimizer at a glance

- Automatic solution selection
- Automatic connection of 2D, 3D and 5-axis jobs
- Change to different solution in the event of an axis limitation
- Preferred solution
- Calculation of clearance planes
- Automatic clearance movements
- Support for machines with more than five axes

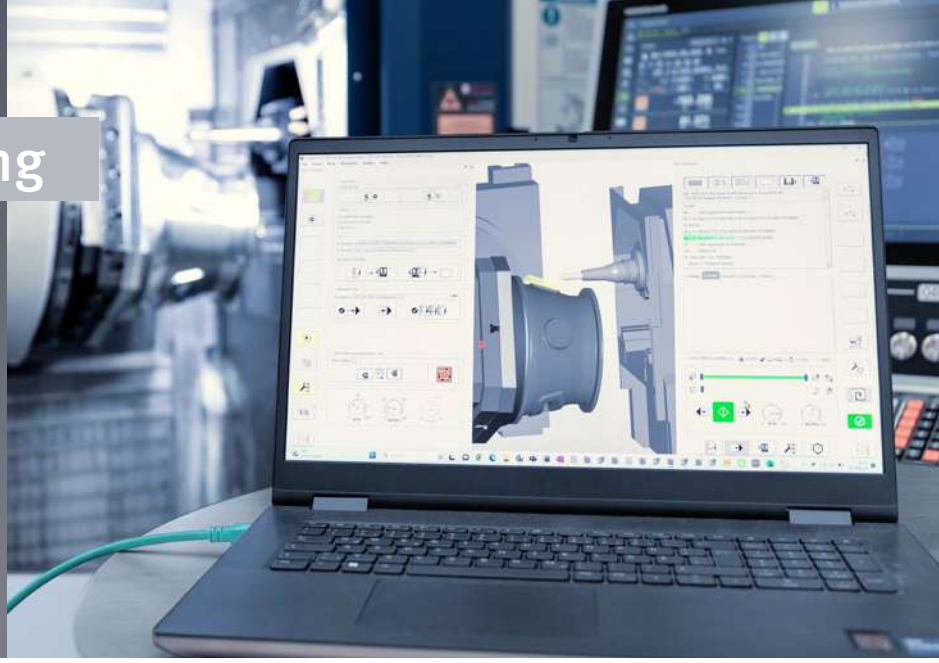
Optimization of additional axes

Milling machines with more than five axes are equipped with additional rotary and parallel axes. With these machines, selecting a solution manually is a highly time-consuming chore. In most cases, you must perform several tests to determine a suitable and collision-free solution given the machine kinematics. Our NC optimizer takes this task off your back and automatically identifies a kinematically correct and collision-free solution. This makes it so much easier to create optimized NC programs for these special machines.



CONNECTED Machining

*hyper*MILL® CONNECTED Machining ensures seamless connection and synchronization between the CAM software and machine.



Perfectly interconnected

*hyper*MILL® CONNECTED Machining creates the best possible connection between the CAM system and machine and ensures full continuity thanks to its bidirectional integration. The *hyper*MILL® VIRTUAL Machining Center serves as the central component, allowing process-relevant data to be transferred directly and securely from *hyper*MILL® to the machine as well as in the opposite direction. This makes it possible, for example, to send tool lists and NC programs directly from the simulation environment to the machine, sync the status of the simulation while the machine is running, or even control the machine using a PC.

Experience CONNECTED Machining live – watch the video

Safety, process control and continuity

A safety concept is applied even before the machine starts. Various machining and machine configurations such as zero-point definitions, tool data and setting parameters are read from the machine controller and then checked against the program data in *hyper*MILL®. The NC program is not released and transferred unless all the data matches and the collision check has been successfully carried out. This safety mechanism effectively protects you from possible operating errors.

Functions

Transfer to the controller:

- Tool information
- NC program

Read

- Tool and zero-point information
- Machine parameters
- Sensor data

Control

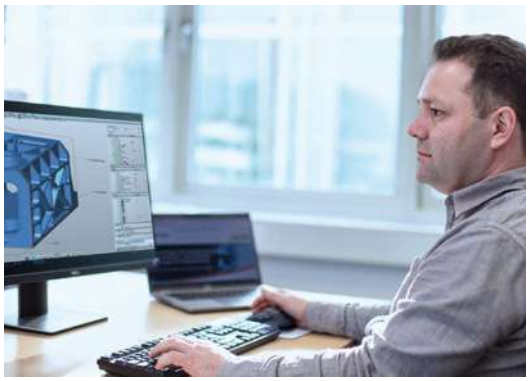
- Remote control of the machine

Viewer Solutions

The *hyper*MILL® CAD Viewer and SHOP Viewer enable you to conveniently view and simulate CAD and CAM data at your workstation.

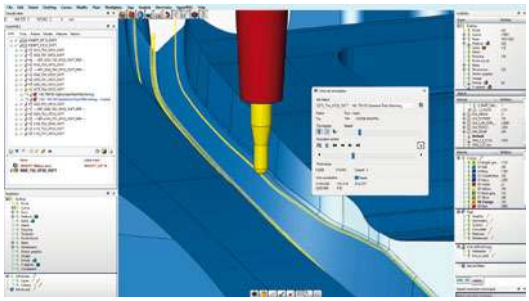
Data viewing at any location

When the experts at the machine have all the important information at their disposal, production processes become both simpler and safer. This is the only way in which machine operators can apply their extensive manufacturing expertise in order to eliminate potential problems in advance.



*hyper*MILL® CAD Viewer: CAD data viewing

The CAD Viewer gives you quick access to the 3D geometry of the components to be manufactured. It is ideal for viewing CAD data and reading out production-relevant information, either for job preparation or directly during production. A comprehensive interface package enables the capture of a wide range of file formats.



*hyper*MILL® SHOP Viewer: Simulate NC programs at the machine

Our *hyper*MILL® SHOP Viewer is designed to enable your employees on the production floor to access the final CAM data more rapidly. Using this tool, you can view and simulate all relevant data directly at the workstation. This means that every detail can be checked on the monitor before the first run.

_hyper_MILL® SHOP Viewer

- Simulating manufacturing processes: The SHOP Viewer allows operators to view the NC program in the workshop. Starting with the stock model, production processes including material removal and the corresponding clamping equipment can be simulated here.
- Checking details: The representation of all geometries, features and toolpaths precisely mirrors the visualization in *hyper*MILL®. This means that the machine operator can check all elements and parameters with just a few clicks.
- Improved communication: Detailed processing information is immediately and consistently available for all parties involved in the manufacturing process.

Interfaces and Integrations

Today, modern manufacturing is unthinkable without a powerful CAM system that smoothly interfaces and perfectly interacts with all your software solutions.

Data management with PLM systems

*hyper*MILL® PLM Connector is a tool for accessing your PLM system directly from *hyper*MILL®. Design data is loaded directly from the PLM system, and then all process-relevant data is transferred back into the system. Connect *hyper*MILL® with relevant data management solutions such as Teamcenter, Windchill or SAP to retain control of your data and benefit from seamless workflows.

Tool management and interfaces

Thanks to our close cooperation with numerous manufacturers, you can easily import tool and technology data into the *hyper*MILL® tool database. In this way, you can quickly and easily create a comprehensive database with all the relevant information in line with manufacturer recommendations.

Connect your central tool management system with *hyper*MILL®. We provide interfaces or integrations for the systems from TDM Systems, ZOLLER, WinTool and NCSIMUL Tools. These enable you to either access the tool data directly from the system or import it into the *hyper*MILL® tool database.

the agile
Hummingbird
MES-System®

HUMMINGBIRD MES:

Switch to Hummingbird MES now to stay on top of deadlines and manufacturing resources!

Do you still resort to spreadsheets or manual planning charts for production planning, and do you rely on paper more than any other data media? Then it's high time you adopted a digital planning tool! The Hummingbird Manufacturing Execution System (MES) empowers companies to map their planning and management processes in a digital and agile way. This helps you increase productivity, avoid errors and waste, and meet all deadlines and schedules.

CAM and MES: Everything from a single source

*hyper*MILL® and Hummingbird from OPEN MIND: Thanks to the Hummingbird integration, both systems are perfectly harmonized. Both *hyper*MILL® and the Hummingbird MES are modular. Even an entry-level configuration or the modules from Hummingbird that are specially adapted to *hyper*MILL® will simplify your daily work. You benefit from time savings and fewer errors owing to transparent management of your NC data and CAM projects.

Service

We at OPEN MIND dedicate a great deal of energy to providing outstanding service to our customers. Whether it's training, consulting or support – you benefit from our comprehensive service concept and experience right from the start.

Close to customers across the globe: think global – act local

Thanks to a network of owned subsidiaries and qualified sales partners, OPEN MIND is somewhere near you. This allows our TEAMCAMFORCE to respond optimally to local requirements and circumstances, as well as provide intensive advice and reliable support directly on site.

Training seminars for beginners and advanced users

*hyper*MILL® training seminars get you in shape for the future! Together we will maximize your programming results with *hyper*MILL®. This is a promise since our training concept offers the right approach for every programmer, and our experts provide you with in-depth application knowledge in training sessions that focus on real-life application.

Our support is always there for you

Whenever you have questions or need help, short response times and competent expert advice is of the essence. Therefore, our service teams are at your side quickly and reliably and always find the best solution. The members of our service teams have a background in manufacturing and undergo ongoing training. As a result, we offer you the best possible support at all times. Wherever you are – we are close to you worldwide and support you with reliable, expert advice.

Customer-oriented consulting: more than 25 years of experience

Based on a comprehensive, customer-oriented concept, OPEN MIND's experts are able to guarantee optimal support in every project stage, whether it's during the decision-making process, during or after the introduction of a system, or for the purpose of process optimization. They perform in-depth analysis of production tasks and process workflows with the main goal of developing tailor-made solutions that make you succeed in your business!

*hyper*MILL® – ALL STRATEGIES AT A GLANCE

Drilling

- Centering ● ● ●
- Simple Drilling ● ● ●
- Drilling with Chip Break ● ● ●
- Optimized Deep Hole Drilling ● ● ●
- Reaming ● ● ●
- Tapping ● ● ●
- Boring ● ● ●
- Back Boring ● ● ●
- Helical Drilling ● ● ●
- Thread Milling ● ● ●
- Circular Pocket ● ● ●
- Gun Drilling ● ● ●
- 5X Helical Drilling

2.5D Milling

- Pocket Milling ● ● ●
- Contour Milling ● ● ●
- Contour Milling on 3D Model ● ● ●
- T-Slot Milling on 3D Model ● ● ●
- Chamfer Milling on 3D Model ● ● ●
- Inclined Contouring ● ● ●
- Inclined Pocketing ● ● ●
- Rectangular Pocket ● ● ●
- Rest Machining ● ● ●
- Face Milling ● ● ●
- Playback Milling ● ● ●
- Plunge Milling ● ● ●

3D Milling

- 3D Optimized Roughing ● ●
- 3D Profile Finishing ● ●
- 3D Z-Level Shape Finishing ● ●
- 3D ISO Machining ● ●
- 3D Free Path Milling ● ●
- 3D Plane Machining ● ●
- 3D Arbitrary Stock Roughing ● ●
- 3D Z-Level Finishing ● ●
- 3D Automatic Rest Machining ● ●
- 3D Corner Rest Machining ● ●
- 3D Cutting Edge Machining ● ●
- 3D Pencil Milling ● ●
- 3D Complete Finishing ●
- 3D Equidistant Finishing ●
- 3D Rework Machining ●
- 3D Rib and Groove Machining ●

Turning

- Rough Turning
- Contour Parallel Turning
- Finish Turning
- 3X Simultaneous Roughing
- 3X Simultaneous Finishing
- Groove Turning
- Groove Plunging
- Groove Finishing
- Parting
- Face Groove Turning
- Face Groove Plunging
- Face Groove Finishing
- Thread Cutting

Probing

- 3D Point Probing
- Workpiece Alignment Along Edge
- Workpiece Alignment Along with Holes
- Rectangular Probing
- Slot-Rib Probing
- Circular Probing
- Axis Dependent Probing

JIG Grinding

- Hole Grinding
- Contour Grinding on 3D Model

Additive Manufacturing

- Additive Manufacturing

● *hyper*MILL® 2.5D ● *hyper*MILL® Classic ● *hyper*MILL® Expert

Software Version 2023

5-Axis Milling

- 5X Optimized Rest Roughing
- 5X Profile Finishing
- 5X Z-Level Finishing
- 5X Equidistant Finishing
- 5X Rest Machining
- 5X Corner Rest Machining
- 5X Free Path Machining
- 5X Rework Machining
- 5X Cutting Edge Plunge
- 5X Cutting Edge Swarf
- 5X Radial Machining
- 5X Halfpipe Machining
- 5X Top Milling
- 5X ISO Top Milling
- 5X Contouring
- 5X Swarf Cutting one Curve
- 5X Swarf Cutting two Curves
- 5X Shape Offset Roughing
- 5X Shape Offset Finishing
- 5X Tangent Machining
- 5X Tangent Plane Machining
- 5X Prismatic Fillet Finishing

5-Axis Tube Machining

- 5X Tube Roughing
- 5X Tube Finishing
- 5X Tube Rest Machining

5-Axis Turbine Blade Milling

- 3D Blade Roughing
- 5X Blade Point Milling
- 5X Blade Platform Machining
- 5X Blade Swarf Cutting
- 5X Blade Top Milling
- 5X Blade Tangent Milling

5-Axis Impeller/Blisk Machining

- 5X MB Roughing
- 5X MB Hub Finishing
- 5X MB Point Milling
- 5X MB Flank Milling
- 5X MB Edge Milling
- 5X MB Fillet Milling
- 5X MB Plunge Roughing

Flexible programming with *hyper*MILL®

*hyper*MILL® offers a comprehensive range of machining strategies that facilitate very flexible programming. As we are independent of other manufacturers, we continuously develop our own solutions at a high pace. This puts us in a position to offer you innovative and high-performance machining strategies and make a significant contribution to your company's success.

Our drilling, 2.5D and 3D strategies are bundled into the following packages:

- *hyper*MILL® 2.5D
- *hyper*MILL® Classic
- *hyper*MILL® Expert

These form the foundation of your modular *hyper*MILL® solution in line with your strategy.

You can choose from our wide range of 5-axis strategies and customize them according to your requirements. In addition, we provide perfectly harmonized strategy packages for special applications (turning, probing, turbine blade machining, etc.).

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OPEN MIND Technologies AG is represented worldwide with own subsidiaries and through competent partners and is a member of the Mensch und Maschine technology group, www.mum.de

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THE CAM FORCE

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www.openmind-tech.com

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