



hyperMILL[®]

2018.1

What's new?



OPEN MIND
THE CAM FORCE

© The helmet was programmed and produced by OPEN MIND.



What's new in 2018.1?

hyperMILL® 2018.1 offers a number of new functions for more efficient programming and manufacturing. *hyperMILL*® VIRTUAL Machining is the new NC code-based simulation solution. 3X simultaneous Turning opens up new possibilities for turning and the *hyperCAD*®-S Electrode module extends the workflow to the Die-sinking EDM.

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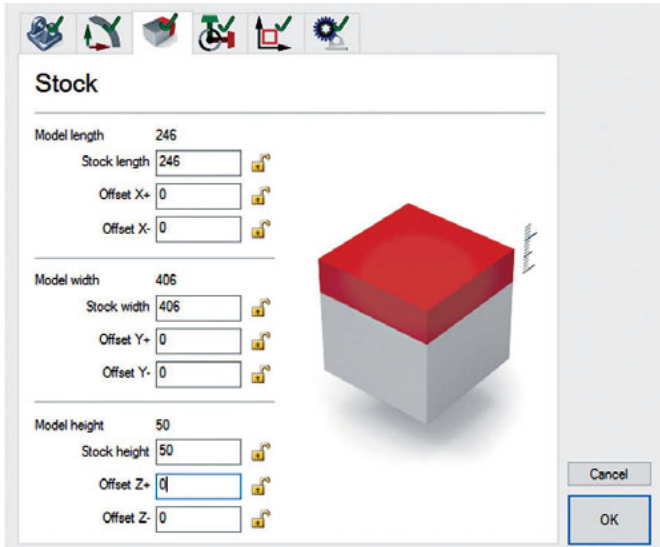
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System requirements: Windows® 7 (64-bit), Windows® 8.1 Pro and Windows® 10, DVD-capable drive

CAD integrations: *hyperCAD*®, *hyperCAD*®-S, Autodesk® Inventor®, SOLIDWORKS, ThinkDesign

Software languages: de, en, es, fr, it, nl, cs, pl, ru, sl, pt-br, ja, ko, zh-cn, zh-tw

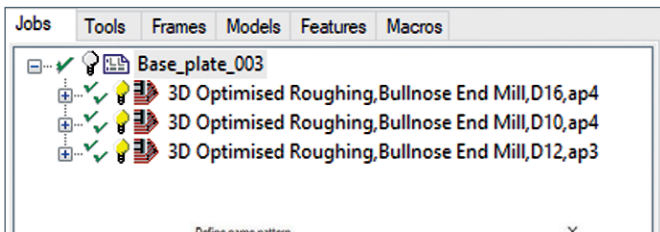


Highlight

Project Assistant

The new Project Assistant allows users to define all the settings necessary for a joblist more quickly. Intuitive user guidance and automated functions make it easier to create a joblist.

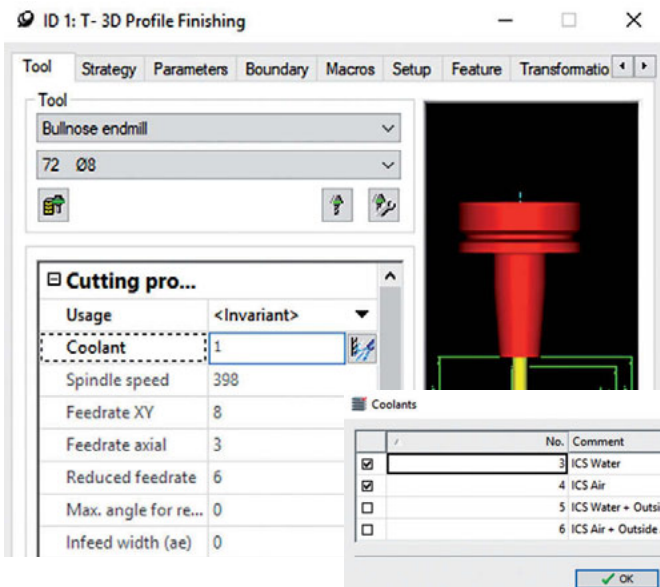
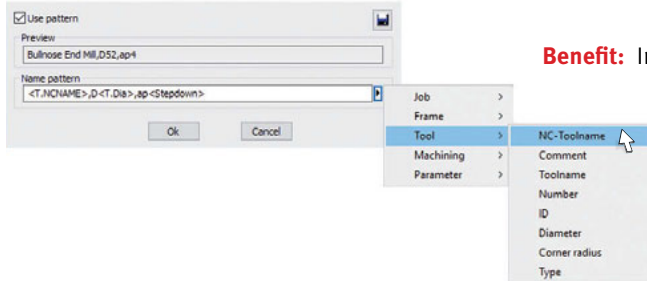
Benefit: Simple and fast joblist creation.



Individual definitions for job names

The names of machining jobs and comments can be customized. The user can use various variables such as allowance, vertical stepdown, frame ID, tool diameter or milling area to create individual names. Changes made to the job parameters are updated automatically in the name pattern.

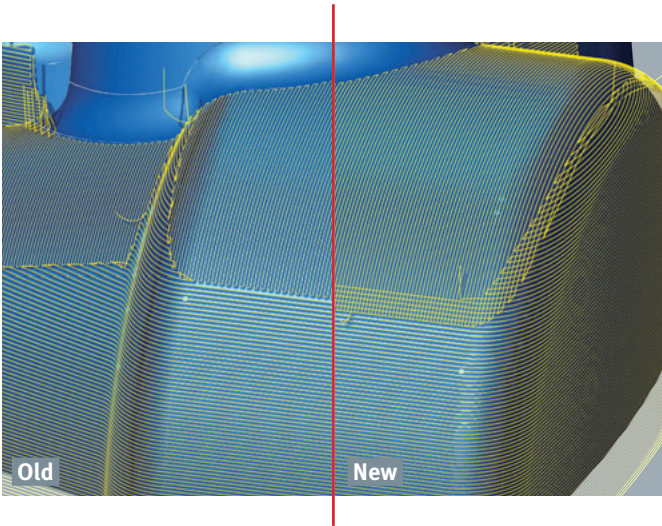
Benefit: Improved overview.



Tool database

Up to seven further coolants can be defined in the tool database in addition to the standard coolants. The different coolants are controlled during the postprocessor run via a unique allocation of IDs. It is possible to specify the individual coolants in greater detail in the tool database.

Benefit: Simplified coolant definition.



Highlight

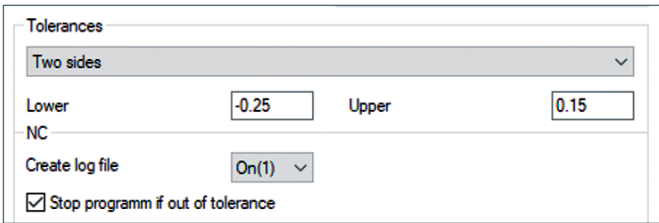
Smooth overlap

The new ‘Smooth overlap’ function optimizes the surface quality in transition areas during slope-dependent machining. Slope boundaries are more precise, and perfect surface blends are achieved at slope boundaries or rest machining boundaries are improved by lifting the tool slightly.

This function is supported in the following strategies:

- 3D Profile Finishing
- 3D Z Level Finishing
- 3D Complete Finishing
- 3D Z Level Shape Finishing
- 3D Automatic Rest Machining
- 5X Rest Machining

Benefit: Improved surface quality.

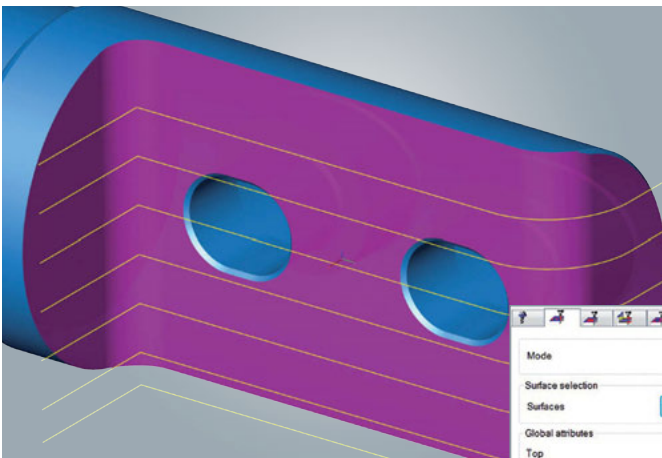


Probing

It is now possible to enter tolerance specifications for the various probing strategies directly via the user interface. In doing so, the user can specify symmetrical or asymmetrical dimensional tolerances.

Benefit: More user-friendly.

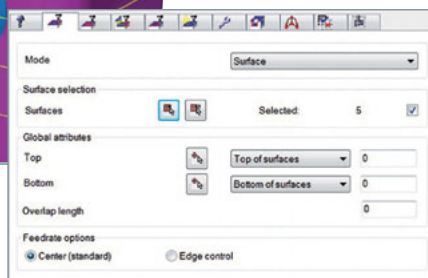
CAM – 2D strategies

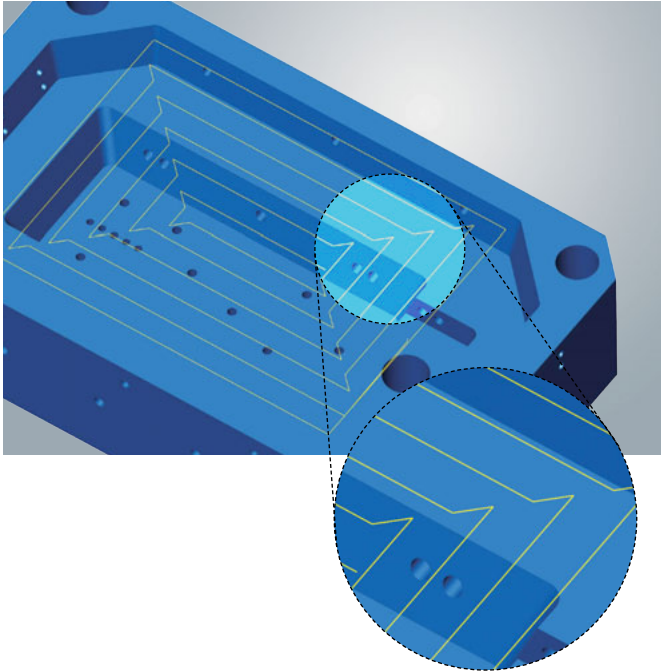


2D Contour Milling on 3D Model

The milling contour is generated automatically by selecting perpendicular surfaces. The machining height and depth are transferred automatically from the surface information. The ‘Contour surfaces’ feature is also available for this new function.

Benefit: Simple and fast programming.

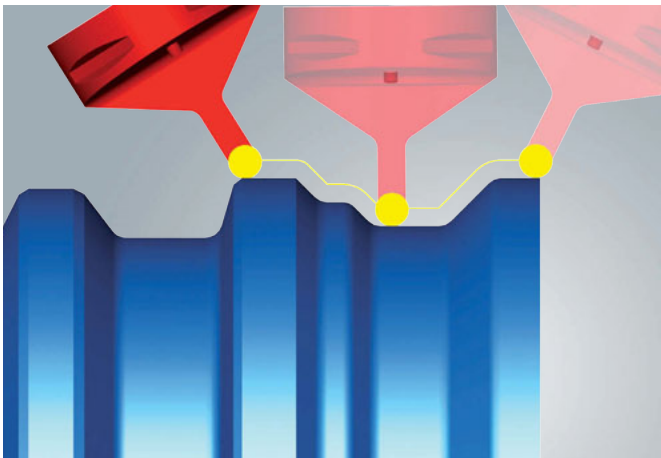


**Highlight****3D Optimized Roughing**

Two new functions are available for adaptive pocket machining:

- With the ‘High feed machining’ option, the lateral infeed can be automatically calculated by defining a scallop height. Special movements have been implemented to avoid rest material in corners when there is a very high lateral infeed.
- Intelligent cut distribution and optimized toolpaths provide greater process safety for remaining rest material.

Benefit: High degree of user-friendliness when using high feed machining with high feed cutter.

**Highlight****3X simultaneous Turning**

Two new strategies for simultaneous machining* enable even more efficient mill turning. Complex workpiece geometries can be machined in a single job step by simultaneously adapting the approach angle during the turning operation. Here, synchronization lines can be used to set the movement sequence of the pivoting axis. The simultaneous movement of the third axis is calculated automatically between two synchronization lines.

Roughing: The innovative approach, which involves using a simultaneous pivoting axis during roughing, offers the user many benefits. The varying tool orientation ensures that the insert is optimally utilized and also helps to extend the tool life.

Finishing: The simultaneous movement of the pivoting axis allows complex contours to be finished in a single job step. This means tool changes and mismatches can be avoided due to a limitation of the accessibility and visible edges.

Benefit: Improved surfaces, fewer tool changes and extended tool life.

*Note: The 3-Axis simultaneous Turning requires an adapted postprocessor.

Highly efficient turning

Turning has never been faster!

Thanks to the innovative rollFEED® cutting inserts from Vandurit for lathes and the perfectly adapted *hyperMILL*® rollFEED® Turning strategy*, flawless workpiece contours can be achieved in no time at all.

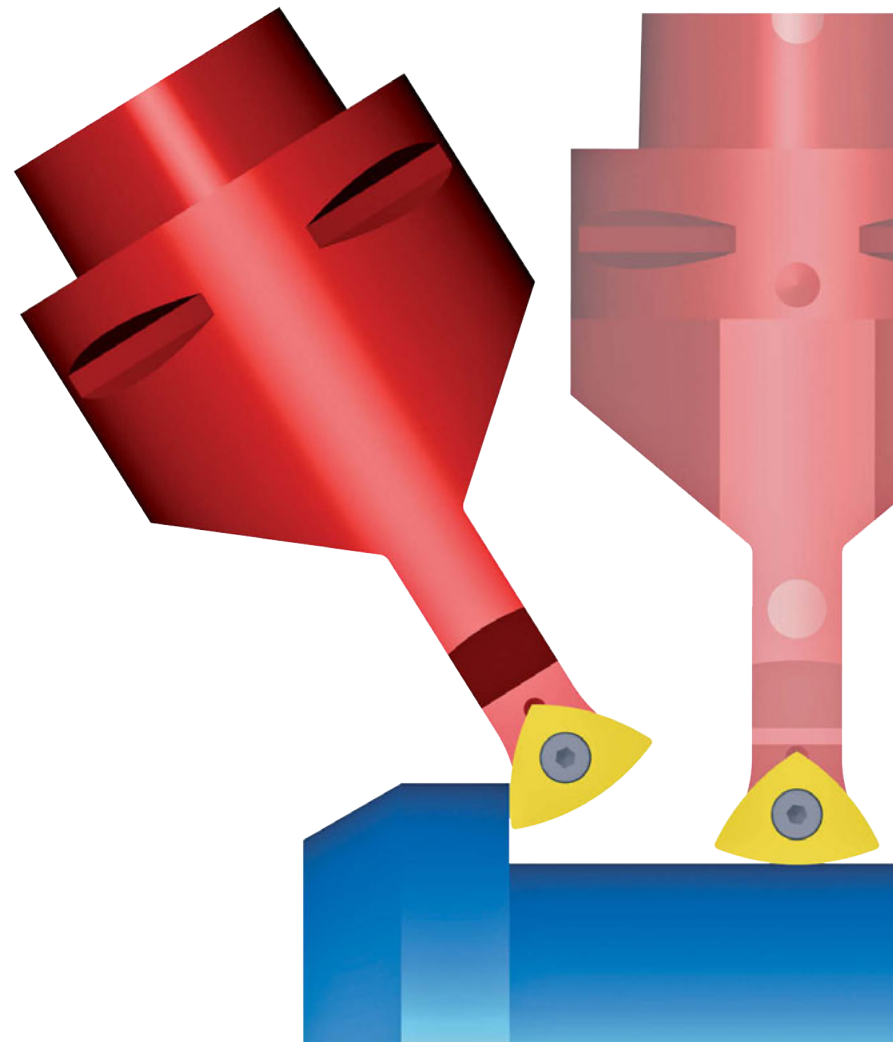
How the process works

This unique turning operation involves rolling the tool insert on a workpiece surface of any shape. The cutting movement is produced by a horizontal swivelling of the pivoting axis with simultaneous compensation for the X and Z axes.

Machining grooves with a single tool

When grooves are machined, the strategy automatically guides the tool from the first to the second plane level via the cylinder face. This way, grooves can be machined with high efficiency with a single tool in a single movement and thanks to the combination of roll and turn movements, even workpieces with large radii can be machined reliably.

*Note: *hyperMILL*® rollFEED® Turning requires an adapted postprocessor.

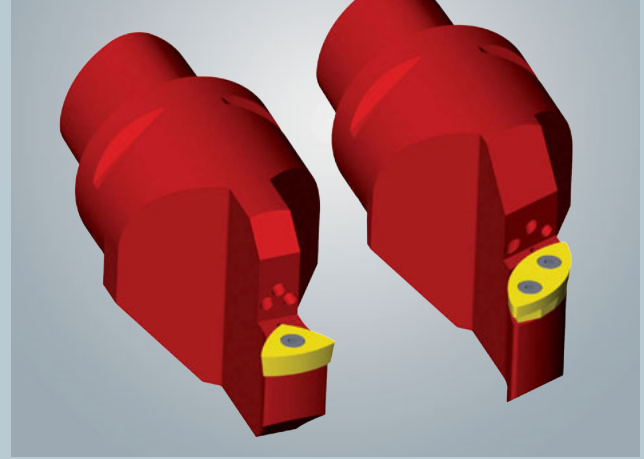


hyperMILL
MILL-TURN Machining

rollFEED®
Turning

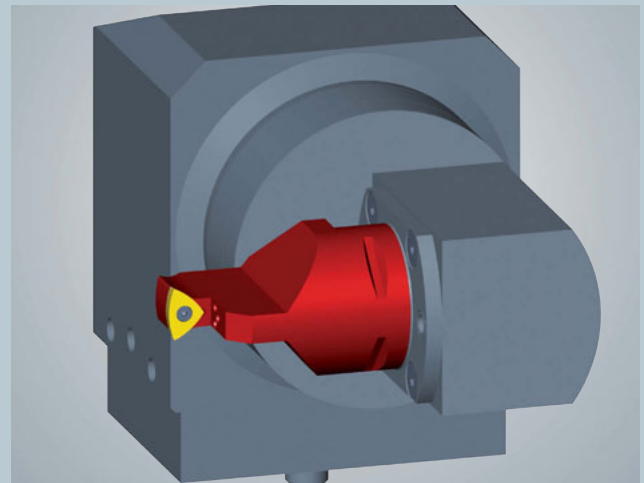
Features

- Highly efficient process
- Generates perfectly finished surfaces free of twists
- Simple to program
- Fewer tool changes
- Undercuts can be integrated into rolling movement
- Mill-turn machines with a pivoting axis only require the rollFEED® holder and inserts.
- Possible to upgrade existing machines with the rollFEED® drive unit



■ rollFEED® tool system and inserts

Only two rollFEED® turning insert geometries are required for turning operations. They can be programmed with the rollFEED® strategy. The rollFEED® QuickChange tool system features specially developed base plates for supporting the unique rollFEED® inserts.

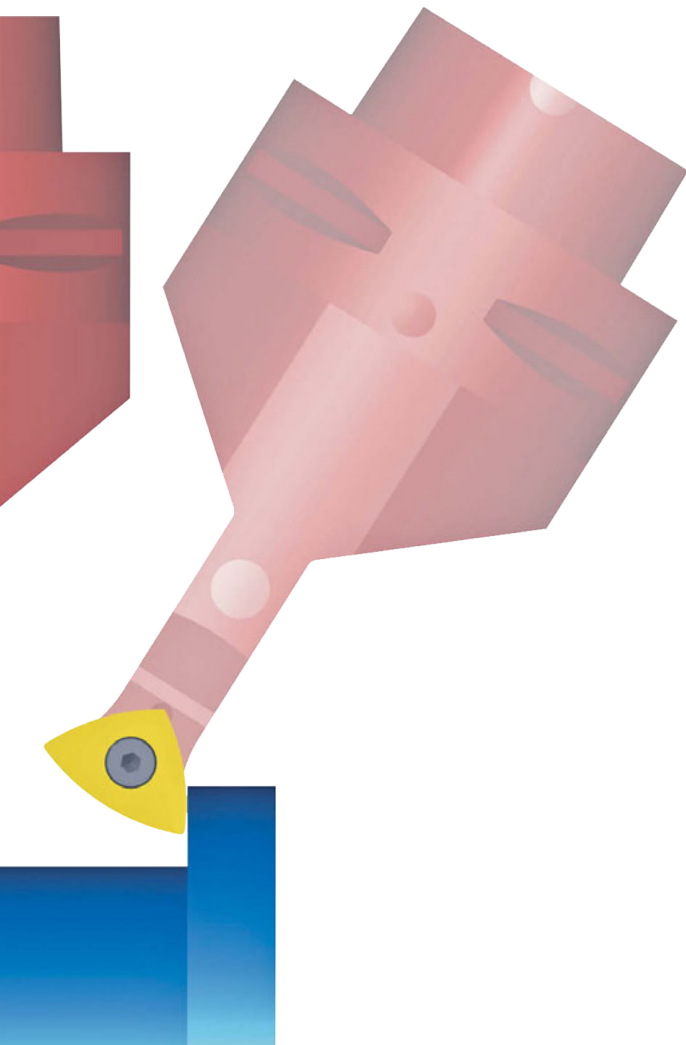


■ rollFEED® drive unit

The rollFEED® drive unit is mounted as a third axis on the turret in the lathe and is used like a driven tool. Mill-turn and turn-mill machines that have an X, Z and pivoting axis and are already equipped with a third axis and don't require this drive unit.

■ Areas of application

- All materials can be machined
- Inserts available in all cutting materials
- For inside and outside machining
- Diverse applications: for plane levels, cylinder, convex and concave surfaces as well as for inclinations and grooves



Perfect fusion of the virtual and real worlds

OPEN MIND has developed *hyperMILL*® VIRTUAL Machining* to evaluate, control and optimize machining processes more reliably. This highly efficient simulation solution consists of three modules: Center, Optimizer and CONNECTED Machining.

Increased safety in simulations

Actual machining situations, that is, the machine including controller and PLC, are mapped virtually and simulated based on the NC code in the *hyperMILL*® VIRTUAL Machining Center. All processes are transparent to the user, and can be analyzed in detail. Real-world machine collisions that can cause costly machine damage, production downtime and thereby critical delays, are avoided.

More than just simulation

Powerful optimization algorithms ensure efficient multi-axis machining design. The *hyperMILL*® VIRTUAL Machining Optimizer automatically finds the best tilt angle, thereby ensuring seamless machining. In addition, *hyperMILL*® CONNECTED Machining enables in-depth networking and synchronization with the machine.

Greater efficiency thanks to a new generation of postprocessors

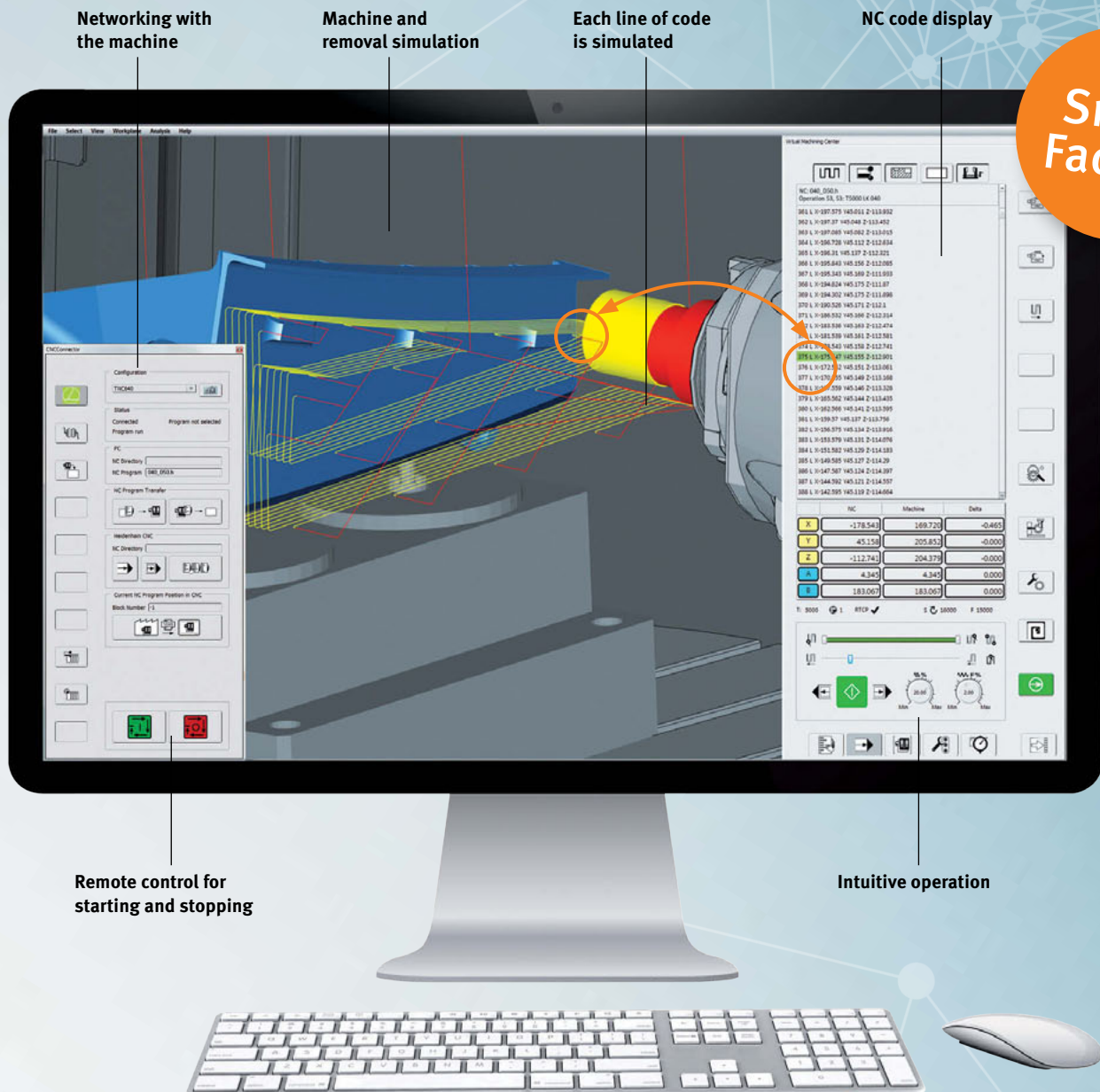
Postprocessor technology* has also been significantly further developed with the *hyperMILL*® VIRTUAL Machining simulation solution, and supplemented with many innovative functionalities. For instance, bidirectional linking is now possible between the NC program and the machining information from *hyperMILL*®. By means of this connection the respective *hyperMILL*® job can be assigned to the NC Code.

*Note: *hyperMILL*® VIRTUAL Machining requires a *hyperMILL*® VIRTUAL Machining postprocessor.



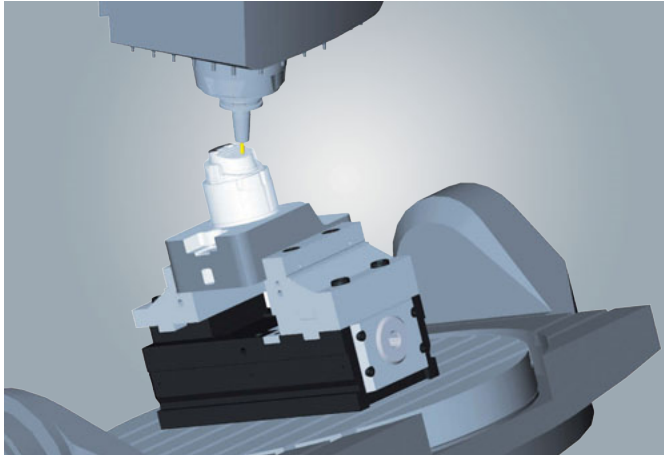
Application areas

- Checking, evaluating and optimizing the machining process
- Matching a job to available machines
- Easily shifting job tasks between available machines
- Support for the acquisition of new machines
- More accurate estimation of costs for bid proposals



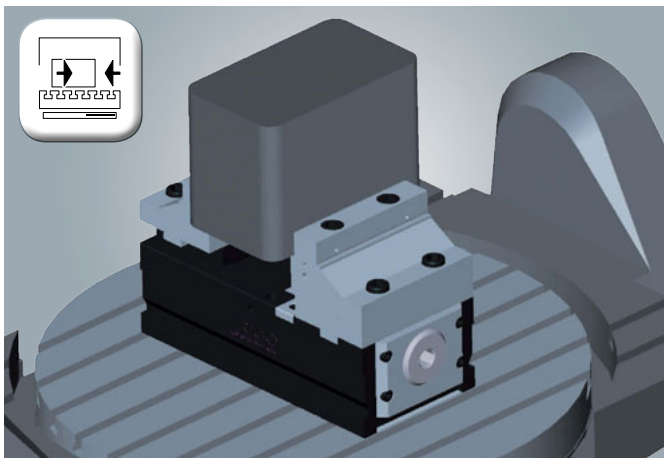
“The *hyperMILL*® VIRTUAL Machining Center is key to designing prove-out processes in a far safer and more efficient way.”

Dr Josef Koch, CTO, OPEN MIND Technologies AG



Workspace monitoring

With the help of a stored machine model, the workspace monitoring checks whether any limit switches are traversed by the 2.5D, 3D, 3+2 or 5axis simultaneous machining movements. The movements of both the linear axes (X, Y and Z) and the rotary axes (A, B and C) are checked, as are the clamps and fixturing systems.



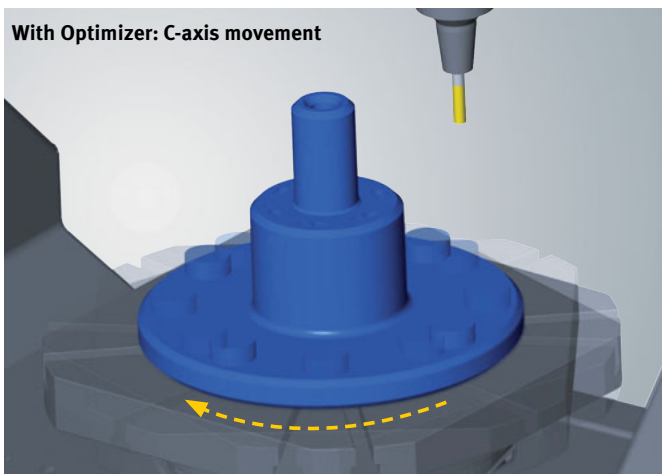
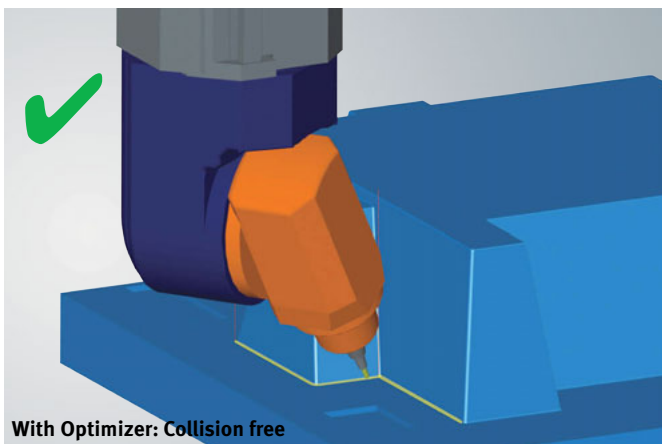
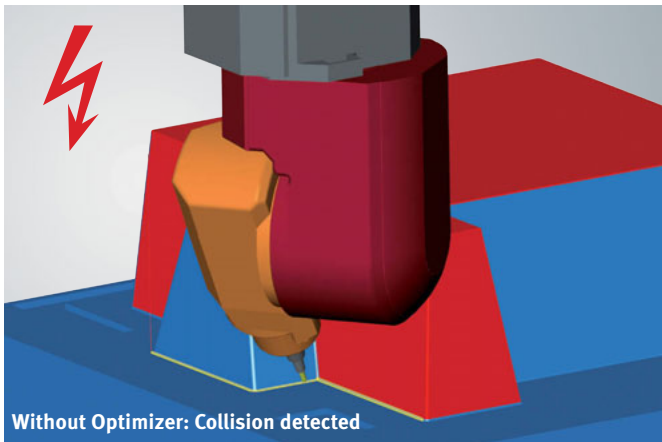
Safe working space analysis

The unique Best Fit function automatically optimizes the machining operation to match the available workspace. Workspace monitoring is able to indicate instances where the limit switches have been traversed but the actual workspace is still sufficient for machining. In this case, the Best Fit function automatically determines the optimal setup location for the respective workspace. This does away with the need for unnecessary set-up changes and resulting downtimes.

```
63820 L X-56.731 Y-11.231 Z19.891
63821 L X-56.763 Y-11.273 Z20.066
63822 L X-56.766 Y-11.315 Z20.244
63823 L X-56.738 Y-11.357 Z20.421
63824 L Z41.502 FMAX
63825 L X-55.419 Y-11.36 Z41.495 A19.638 C311.949 F9999
63826 L X-54.1 Y-11.362 Z41.489 A19.281 C312.993
63827 L X-52.781 Y-11.364 Z41.483 A18.931 C314.074
63828 L X-51.462 Y-11.367 Z41.477 A18.588 C315.195
63829 L X-50.143 Y-11.369 Z41.472 A18.251 C316.355
```

Setting breakpoints

The simulation can be controlled to stop at certain locations in order to reliably check critical points and estimate the subsequent processes more precisely. The breakpoints are created automatically under certain conditions, such as a tool change or a change from rapid to cut movements. Moreover, breakpoints can also be selected manually through any NC block line, or picked up from any point on the toolpath.



Avoiding repositioning

In order to avoid time-consuming repositioning and retracts, the Optimizer analyzes not just individual operations but entire machining sequences. Based on this analysis, the Optimizer selects the ideal solution for machining the entire sequence together, within the given machine limits.

Movement optimization

If a 3axis movement is not possible due to detected collisions, the Optimizer changes the movement with the aid of a fourth or fifth axis. In this example, the fourth position would lead to a collision with the tool and spindle assembly. For this reason, the C axis rotates so that the machining can be carried out in a collision-free manner.

Optimized movements

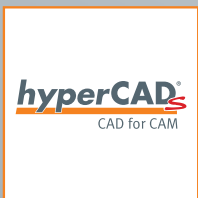
The movements between the individual operations are perfectly aligned with the kinematic properties of the respective machine. The Optimizer analyzes these movements to avoid large compensation movements during repositioning. Meanwhile, the rotary axes are moved along the shortest path, and the movements of the linear axes are minimized. This allows greater speeds to be achieved during the movements.

CAD for CAM

In a class of its own among CAD systems

Only a high-end CAM developer can do CAD for CAM. With this in mind, OPEN MIND Technologies AG – known as an innovative pioneer – developed a new CAD system from scratch that is perfectly matched to *hyperMILL®*. The system has its own 3D CAD kernel made by OPEN MIND. The result is a unique CAD system for CAM programmers that is very easy to learn and that vastly accelerates NC programming processes.

hyperCAD®-S fully exploits the performance offered by contemporary hardware systems to create digital manufacturing data. The advanced and extremely powerful 64-bit system is the perfect solution for mastering many of the daily challenges that arise when working with meshes, faces and solids to create precise components and tools. Large volumes of imported data can be prepared for subsequent NC programming easily, quickly, safely and completely independently from the original CAD system. *hyperCAD®-S* is pure ‘CAD for CAM’.



Interfaces

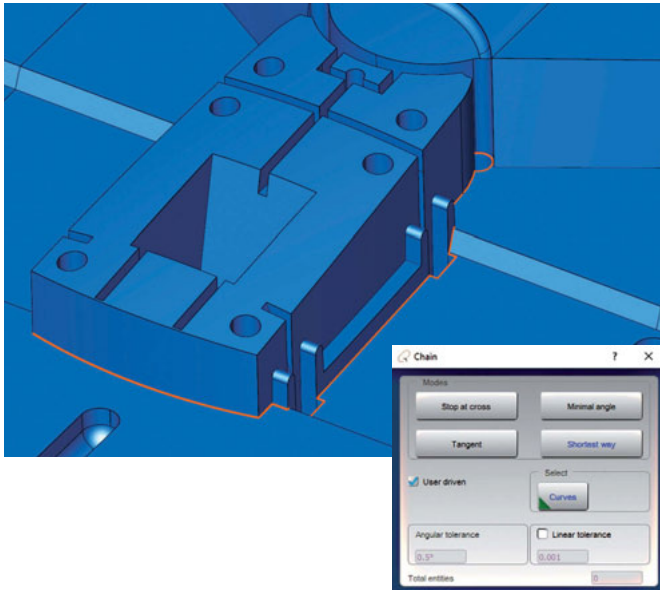
Geometric
Engine

Solids

Mesh

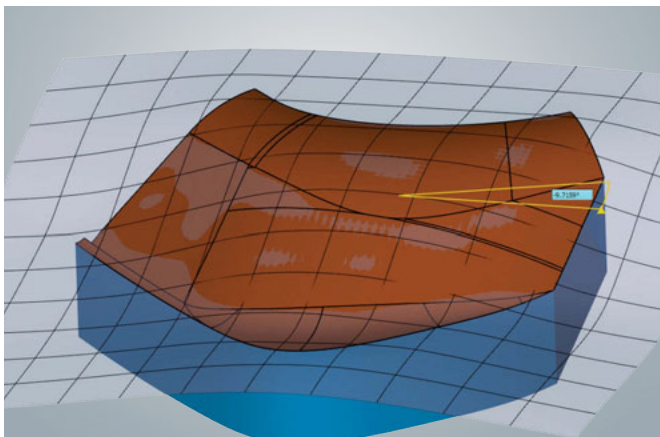
Deformation

Electrode

**Highlight****Chain selection**

The new 'Shortest way' mode automatically looks for the direct route between two selected edges. This makes it possible to quickly select logically running boundaries on the model. The user can influence the course of the chain using the 'User driven' option.

Benefit: More user-friendly.

**Highlight****Global fitting**

This new function allows multiple faces to be joined into one face with a defined ISO orientation. This provides the user with a uniform basic orientation for all face patches for the purpose of programming in *hyperMILL*®. Trimmed analytical faces can also be joined to form a face.

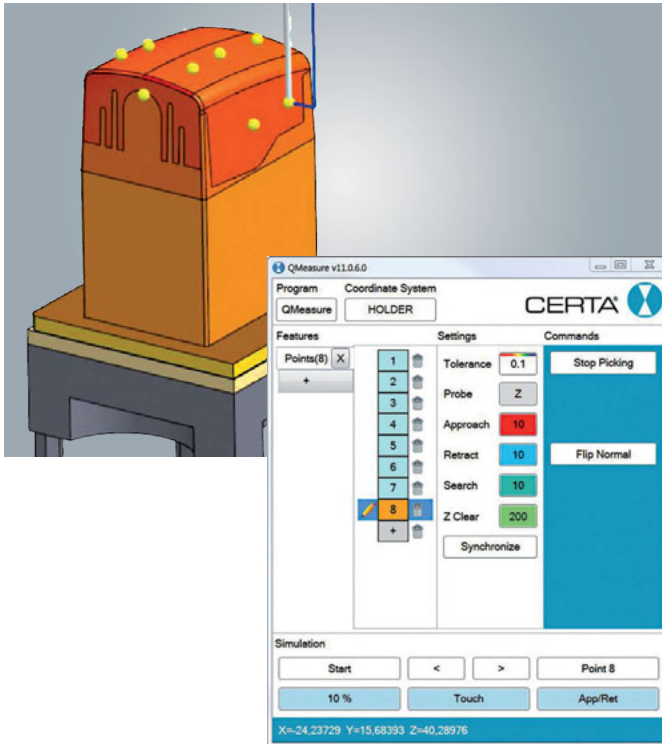
Benefit: Fast creation of a single face for NC programming.

Variable	Formula	Value	Physical quantity	Unit of measure	Min	Max	Units	Assigned	Description
Step		5		Length	mm	1	5	0	
DR	$R(\text{Step}) - 1 \cdot 40 \cdot R(\text{Step}) - 2 \cdot 62 \cdot R(\text{Step}) - 3 \cdot 84$	84.0000	Length	mm		0	0		
DR	$R(\text{Step}) - 1 \cdot 5 \cdot R(\text{Step}) - 2 \cdot 36 \cdot R(\text{Step}) - 3 \cdot 80$	80.0000	Length	mm		0	2		
Radius		130	Length	mm	0	500	0		
Open	$R(\text{Step}) - 1 \cdot 88 \cdot R(\text{Step}) - 2 \cdot 100 \cdot R(\text{Step}) - 3 \cdot 138$	138.0000	Length	mm		0	0		
Distance	$2 \cdot \text{Step} \cdot \text{Open}$	-18.8816	Length	mm		0	1		
Distance	$\text{Radius} \cdot 2$	260.0000	Length	mm		0	0		
DR	$\text{Radius} \cdot 1.5$	195.0000	Length	mm		0	0		
DR	$\text{Step} \cdot 2 \cdot \text{Open}$	528.8844	Length	mm		0	0		
DR	$R(\text{Step}) - 1 \cdot 40 \cdot R(\text{Step}) - 2 \cdot 62 \cdot R(\text{Step}) - 3 \cdot 84$	84.0000	Length	mm		0	0		
		0.0000							

Highlight**Parameter list**

The new parameter list is used to manage variables centrally and assign values to the variables. These values may be defined on the basis of mathematical conditions, functions and constants. Users can now use these variables to control the positioning of clamps. The variables can also be displayed in a text field.

Benefit: Simplified definition of clamp positioning.



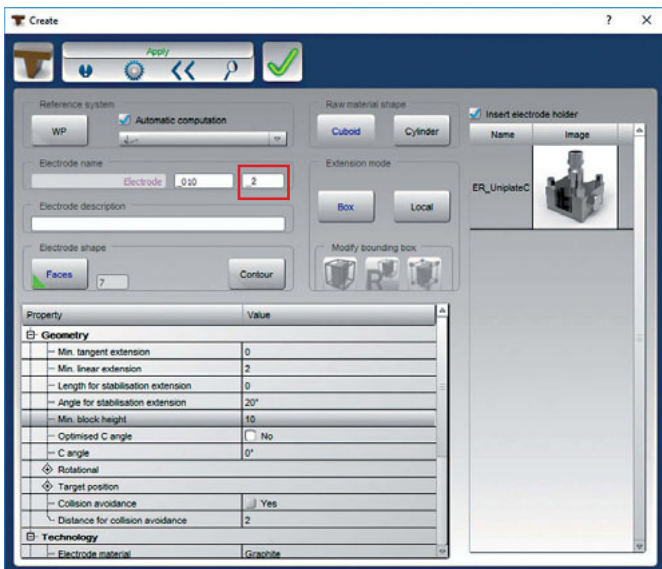
Highlight

Consistency in the electrode process

Thanks to the new interface and integration for CERTA Systems, a continuous process chain is provided for electrode manufacturing in *hyperCAD®-S* and *hyperMILL®*.

- **Q-Measure:** The integration of Q-Measure in *hyperCAD®-S* allows the user to create measuring points and tolerances for measuring machines directly in their familiar *hyperCAD®-S* environment. All relevant measuring points can be defined quickly and easily in *hyperCAD®-S*. The electrode is identified on the measuring machine, the program is generated automatically and the measurement is started. Should any deviations occur in the target/actual comparison when measuring, the necessary process steps are initiated automatically.
- **CERTA Systems Job Manager:** The technology data from the *hyperCAD®-S* Electrode module is transferred to the CERTA Systems Job Manager via the report function. The Job Manager automatically generates EDM programs and transfers them to the eroding machine.

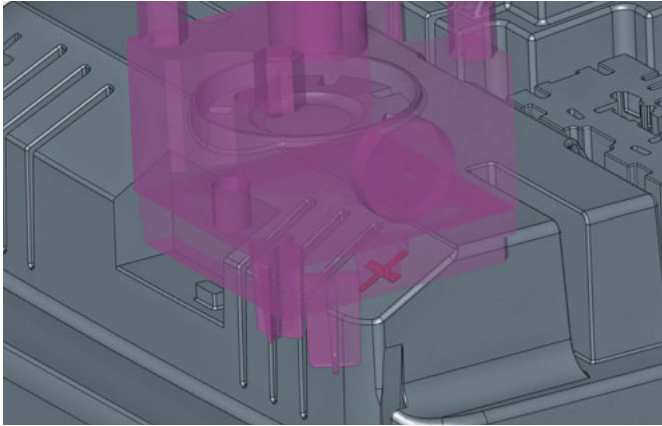
Benefit: Automation of electrode manufacturing.



Version numbers for electrodes

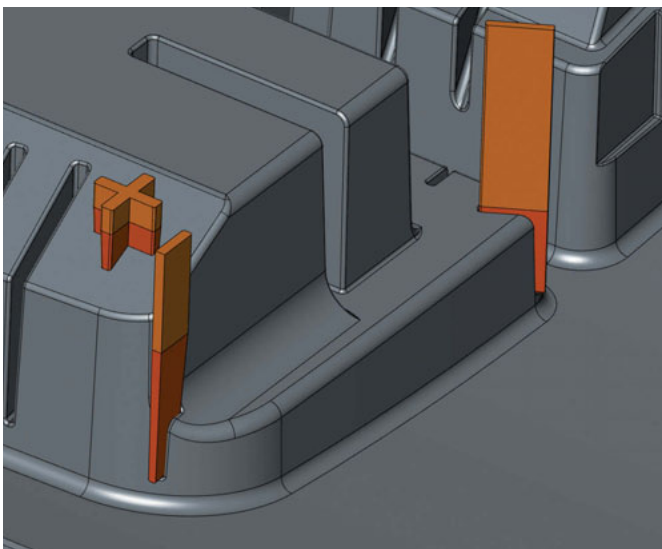
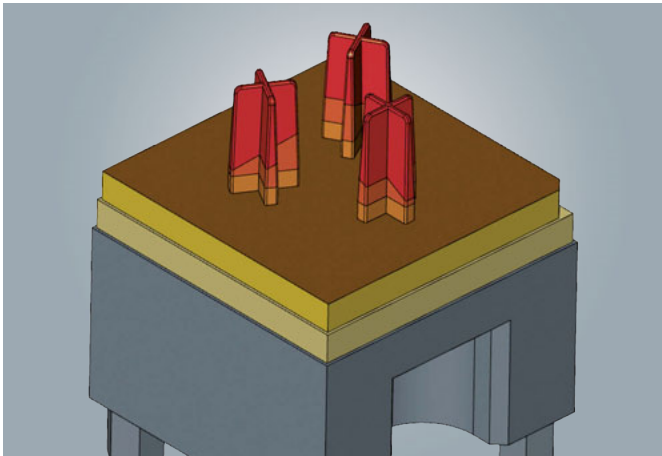
hyperCAD®-S automatically generates a version number for existing electrodes. This protects against accidental overwriting and provides a reliable version history.

Benefit: Greater clarity and safety in electrode management.

**Highlight****Rotational electrode**

Allows the circular placement of multiple electrode geometries with different spark gaps on a holder. The angle, direction and distance can be specified. The various geometries are automatically checked for collisions when they are placed.

Benefit: Time savings during milling and eroding.

**Create partial electrode**

This command creates an electrode geometry without any raw material or holder from one or more areas. Afterwards, the various electrode geometries can be placed on one or multiple holders.

Benefit: Creation of individual electrodes.

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