



# hyperMILL®

2021.2

What's New?



**OPEN MIND**  
THE CAM FORCE

© The helmet was programmed and produced by hyperMILL.

# What's New in 2021.2?

Programming with *hyperMILL*® 2021.2 is getting faster, and the software has also become more user-friendly. One example of this is the convenient and secure display of the referenced geometry data in the individual strategies. Important enhancements, such as “High precision surface mode” and “Smooth overlap,” ensure an even more versatile application of our 3-axis and 5-axis strategies. Thanks to the BEST FIT highlight, *hyperMILL*® enables component alignment at the touch of a button. A new method guarantees highly efficient and safe movements for machining centers with a machine tunnel, and *hyperCAD*®-S also offers new functions for electrode production.



## Contents

### General

<b>Highlight</b> Advanced visualization options	3
Advanced report output	3
Tool database: “Allow plunge”	4
Edit toolpath	4
Macro database	4

### CAM – 2.5D Strategies

T-Slot Milling on 3D Model	5
----------------------------	---

### CAM – 3D Strategies

3D Iso Machining	5
3D Equidistant Finishing	5
<b>Highlight</b> 3D Z-level Shape Finishing	6

### CAM – 5-axis Strategies

5-axis Equidistant Finishing	6
5-axis Tube Machining	7

### CAM – VIRTUAL Machining

Individual origin output	8
<b>Highlight</b> Optimizer: G1 movement optimization	8
<b>Highlight</b> Optimized tunnel logic	8

### CAM – ADDITIVE Manufacturing

<b>Highlight</b> Weave mode	9
Tilt strategy: Rigid guiding	9

### *hyperMILL*® BEST FIT

<b>Highlight</b> BEST FIT component alignment	10
---	----

### CAD Integration: *hyperCAD*®-S

<b>Highlight</b> New import formats	13
Data import with templates	13
Mating	13
Shapes – rotation	13
Drafting with V-sketch	14
Shape contour	14
Average curve	14

### *hyperCAD*®-S Electrode

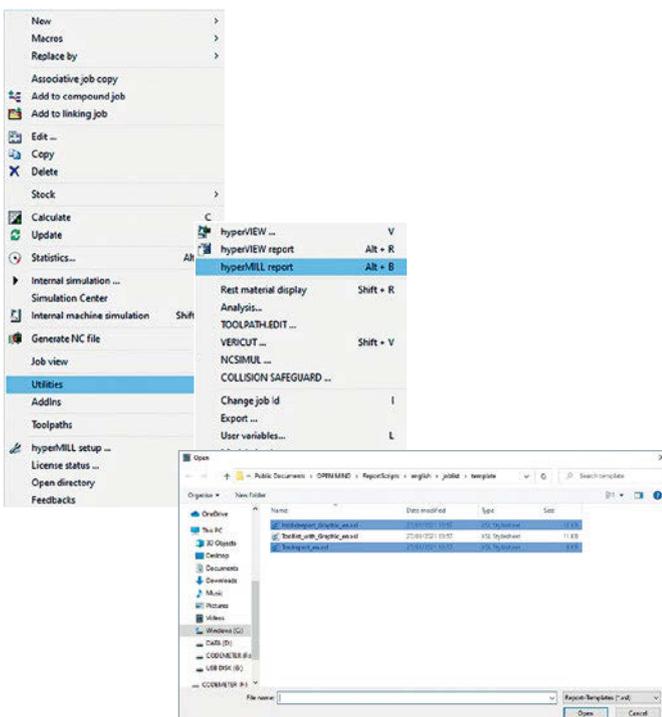
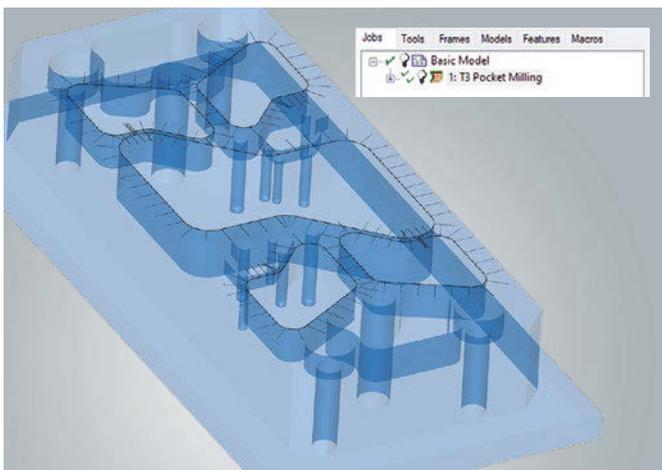
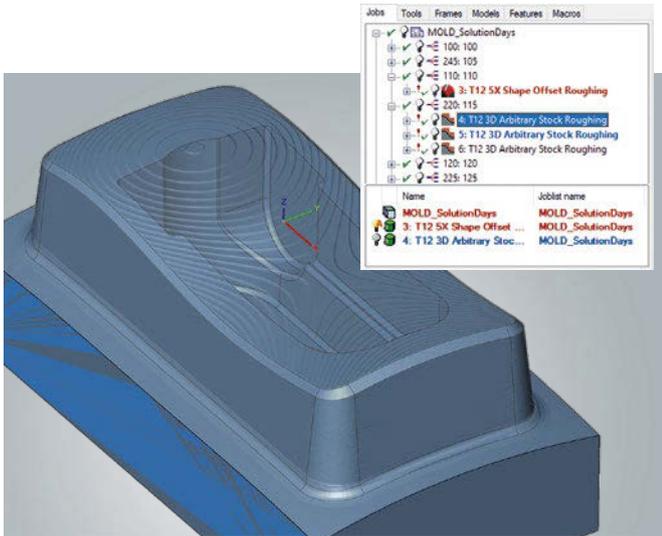
Create electrode	15
<b>Highlight</b> <i>hyperCAD</i> ®-S Electrode Converter	15



QR codes are clickable

**Review system compatibility:** To ensure optimal performance and stability, we recommend regularly running our diagnostic program, Systemchecktool.exe.

**Note:** Windows® 10 may reset the graphics driver or its settings when carrying out updates. **System requirements:** Windows® 10 (64 bit) | **CAD Integrations:** *hyperCAD*®-S, Autodesk® Inventor®, SOLIDWORKS, ThinkDesign 64 bit | **Software languages:** de, en, es, fr, it, nl, cs, pl, ru, sl, tr, pt-br, ja, ko, zh-cn, zh-tw



## Highlight

### Advanced visualization options

New functions in *hyperMILL*® ensure a better overview during CAM programming.

#### ■ Automatic stock display

The stock can now be displayed automatically for any machining job. This means that, if required, the used stock can become immediately visible when a job is selected. This visualization option can be activated or deactivated at any time in the shortcut menu or by double-clicking the light bulb symbol.

#### ■ Preview of selected entities

The entities used in a job, such as curves, faces, or points, are highlighted in *hyperMILL*® when this job is selected. The visualization option can be activated or deactivated at any time using the “Q” shortcut.

Info: The preview of selected entities is only available in *hyperCAD*®-S.

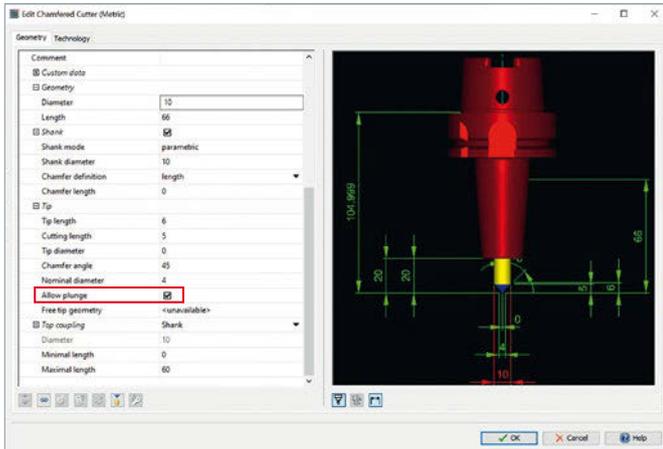
**Benefit:** Improved clarity.

### Advanced report output

When creating reports, several report variants can now also be generated in parallel. For example, a special tool report for tool provision and a general job report for the machine operator can be created at the same time.

In addition, reports for turning tools can now be created in the *hyperMILL*® AUTOMATION Center.

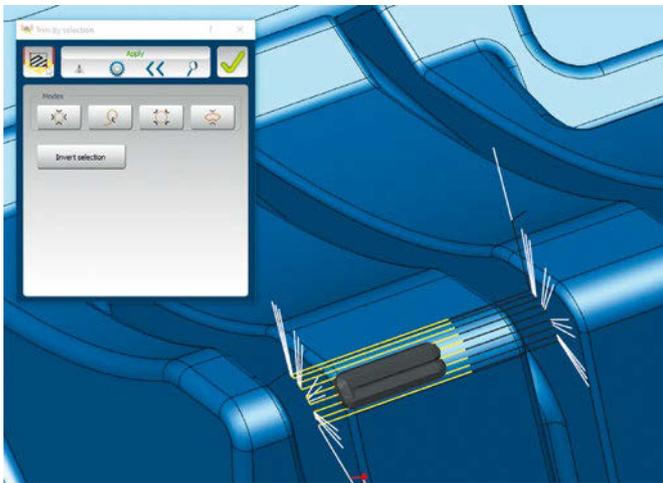
**Benefit:** Improved user-friendliness.



## Tool database: “Allow plunge”

In the tool database, the “Allow plunge” checkbox can now be used for the Chamfer Cutter tool type to specify whether the tool is able to plunge into the material. The tool properties are taken into account during the collision check in the simulation. For example, a collision message would appear if the upstream drilling operation was not carried out correctly and the “Allow plunge” checkbox was deactivated.

**Benefit:** Increased collision safety.



## Edit toolpath

In the new version of *hyperMILL*<sup>®</sup>, the interactive toolpath editing method is now also available for 5-axis strategies. This allows the user to edit existing toolpaths very flexibly and adapt them optimally to the component conditions. The intuitive operation makes it easy to trim the toolpath, for example, at selected points and curves, in a specific area, or on a plane. Complete toolpath sequences between two G0 movements can also be selected and removed. Approach and retract macros allow clean machining of the trimmed areas. The modified toolpaths are checked for collisions.

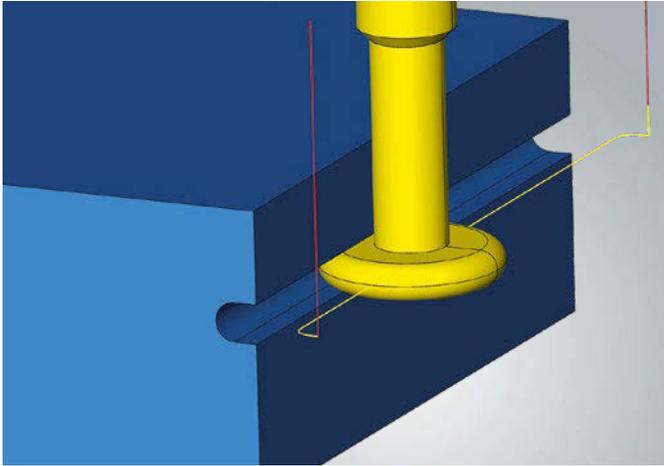
In addition, the “Edit toolpath” command can now be called directly via the context menu of the toolpaths.

**Benefit:** Flexible machining of toolpaths.

## Macro database

Frames can now also be saved in a job macro in the macro database. To apply a macro later, the required frames must be created in *hyperMILL*<sup>®</sup> in advance.

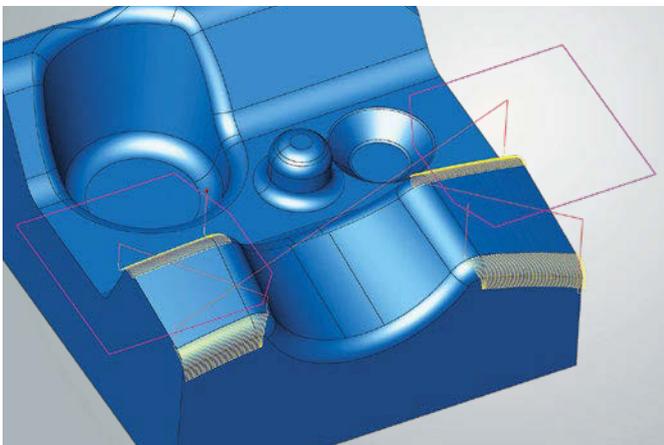
**Benefit:** Improved user-friendliness.



## T-Slot Milling on 3D Model

The Woodruff cutter type can now also be used in the strategy. The tool geometry is fully mapped in *hyperMILL*®, and is used for both calculation and simulation.

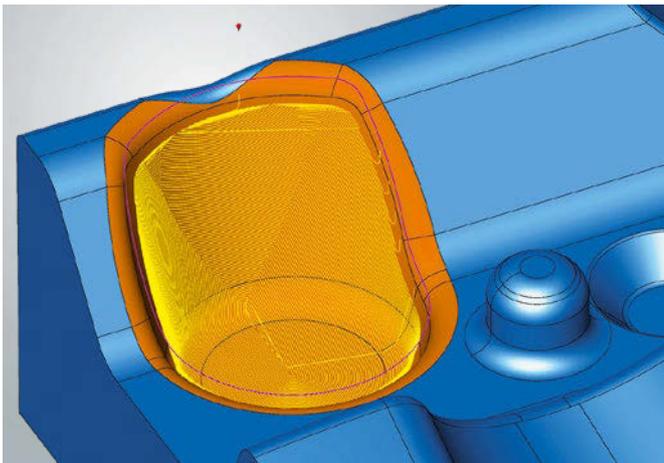
**Benefit:** Additional cutter type.



## 3D ISO Machining

Multiple bounding curves can now be used in the strategy to allow different areas to be machined in one job. Several closed bounding curves can be selected to precisely limit the machining.

**Benefit:** Improved user-friendliness.

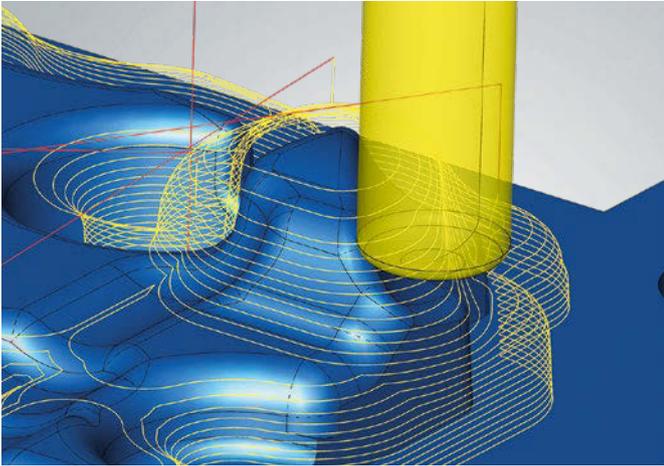


## 3D Equidistant Finishing

The milling area can now additionally be defined by selecting bounding curves. This allows targeted machining of individual areas on a surface model.

The “Smooth overlap” option can be used to achieve clean transitions and a seamless appearance. This generates an overlap at the bounding curves and enables a milling pattern without any noticeable transitions.

**Benefit:** Improved user-friendliness and increased machining quality.



Machining with free tool geometry

### Highlight

## 3D Z-level Shape Finishing

Several innovations help to improve machining.

- **Optimized sorting of toolpaths**

The reduced number of retractions ensures more homogeneous toolpaths

- **Smooth overlap at boundary**

The toolpaths overlap beyond the boundary, allowing transition-free machining

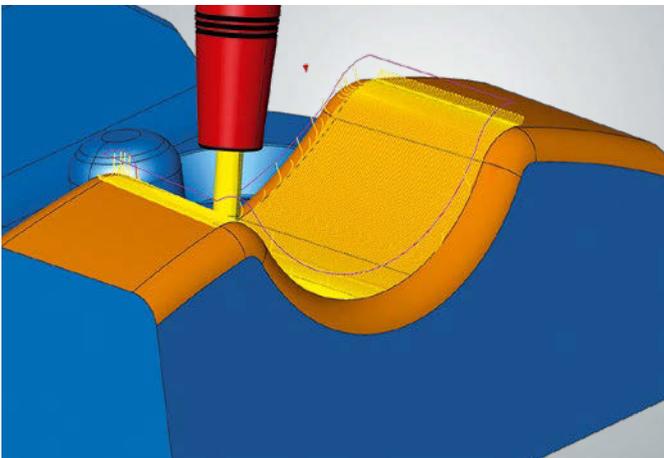
- **Free tool geometry**

A free tool geometry can now be used for the calculation and simulation of the toolpaths

- **Trim toolpath to stock**

This option allows toolpaths to now be trimmed to the stock, and unnecessary toolpaths are avoided

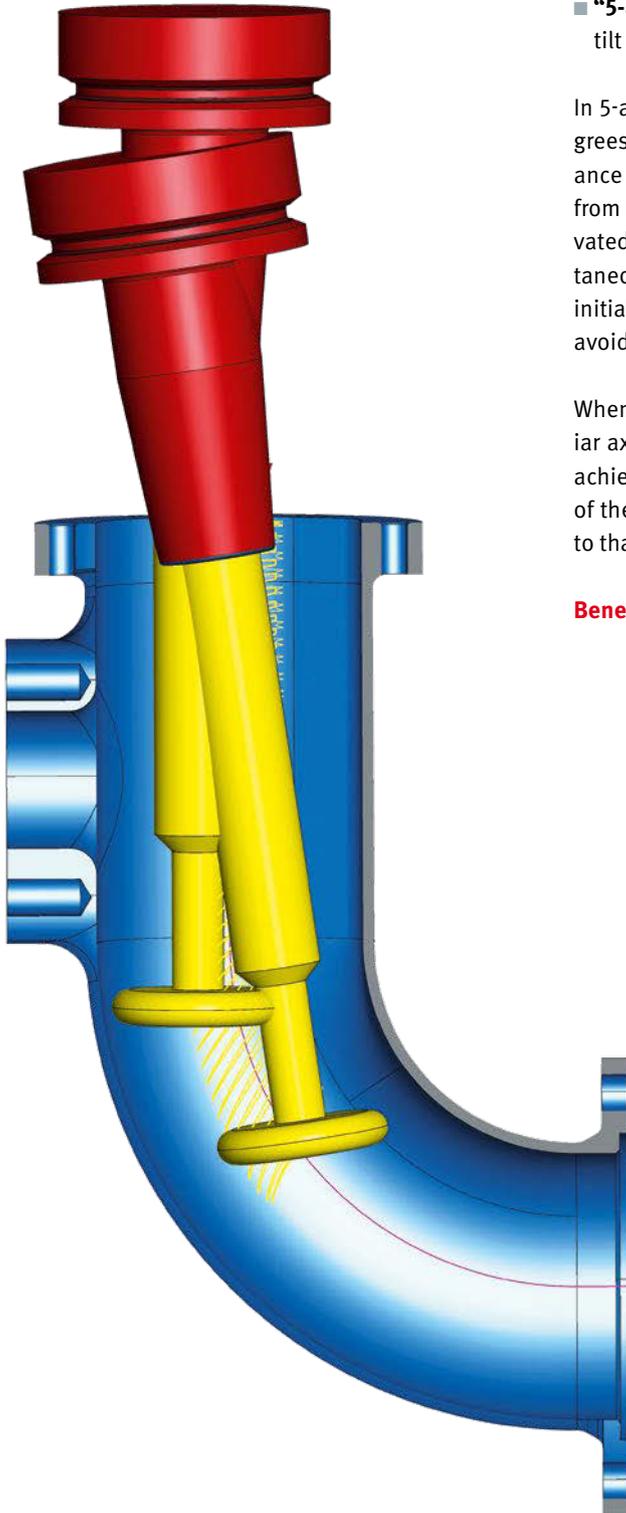
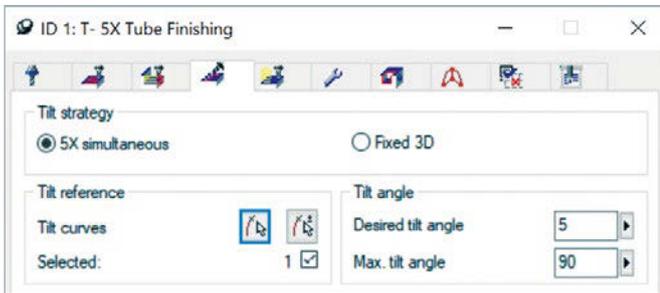
**Benefit:** Increased machining quality.



## 5-axis Equidistant Finishing

As with 3-axis machining, the milling area can now additionally be defined for the 5-axis strategy by selecting bounding curves. This allows targeted machining of individual areas on a surface model.

**Benefit:** Improved user-friendliness.



## 5-axis Tube Machining

The strategies for tube machining have been improved. To ensure greater clarity, the 5-axis tab has been standardized and now offers the same setting parameters for all strategies.

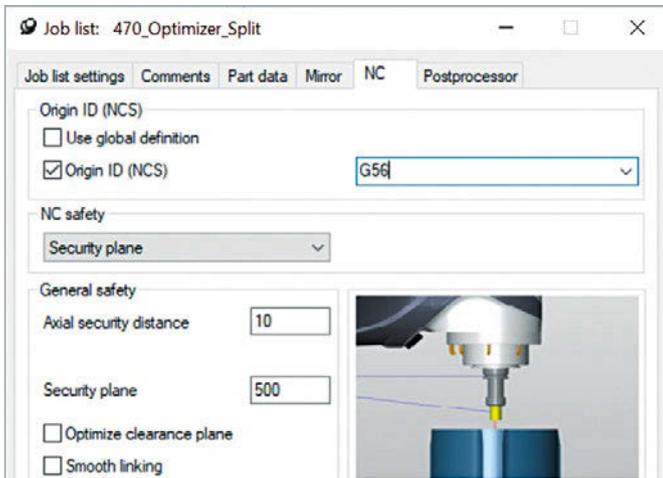
The fixed tool angle no longer needs to be activated via a checkbox, as alternative options are now available:

- **“Fixed 3D”** creates toolpaths with the tool axis in the direction of the Z axis of the frame
- **“5-axis-simultaneous”** is possible in conjunction with a desired tilt angle and a maximum tilt angle

In 5-axis simultaneous machining, a desired tilt angle of zero degrees results in modified machining behavior. If collision avoidance is deactivated, indexed machining is carried out exclusively from the start point to the end point. If collision avoidance is activated, indexed machining starts and machining continues simultaneously when collision avoidance is necessary. When tubes are initially vertical, unnecessary movements of the rotary axes are avoided in this way.

When a ball mill is used with tool check switched off, the familiar axial retract movement now no longer takes place. In order to achieve a collision-free G1 movement of the tool tip (sphere) out of the component, the retraction to the start plane is now similar to that of a lollipop cutter.

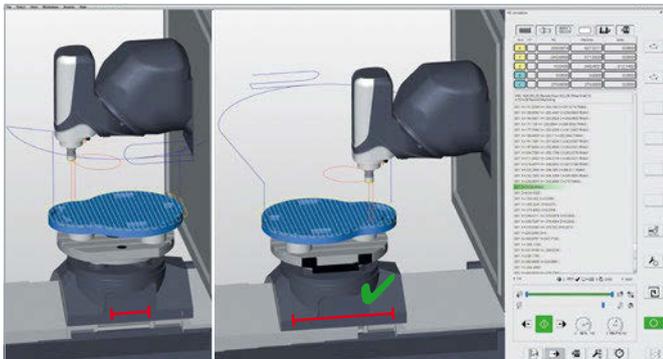
**Benefit:** Optimized machining and improved setting options.



## Individual origin output

It is now possible to define a user-specific origin in the job list for output in the NC program. For this purpose, when the “Origin ID” checkbox is selected, an origin can be selected from a list or a free origin parameter, such as G56, can be entered. This makes it easier to work in parallel on multiple projects or also with several programmers when using a virtual machine.

**Benefit:** Work more flexibly with origins.



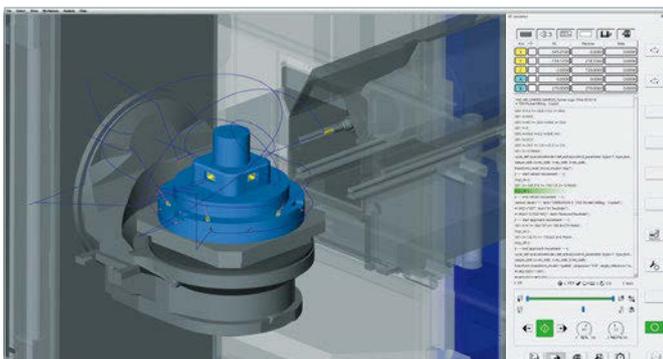
— Axis traverse path

### Highlight

## Optimizer: G1 movement optimization

The Optimizer detects violations of the axis limitations and then optimizes the movement sequences. To do this, it can break G1 toolpaths, find a new solution within the axis limits, and continue machining. Here, the approach and retract movements are smoothly linked to the toolpaths and are collision-checked. The function automatically optimizes the NC programs, and ensures that there is not an axis overtravel.

**Benefit:** Simplified programming through automatic solution generation and increased process reliability.



### Highlight

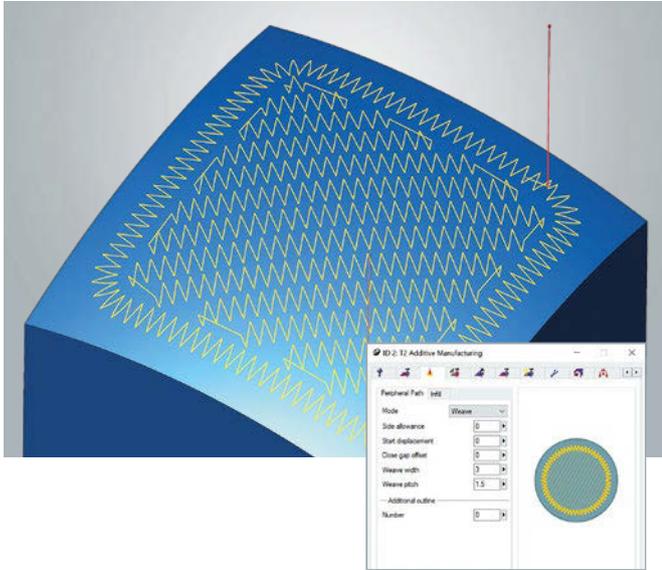
## Optimized tunnel logic

On machines where the tool can be retracted into a tunnel, there is now the option of using a special approach and retract strategy. In the job list, the “Optimized tunnel logic” option is selected under NC safety. To join movements with safety logic, the tool is retracted into the machine tunnel and the workpiece is repositioned over four axes.

**Benefit:** More efficient machining.

**Highlight**

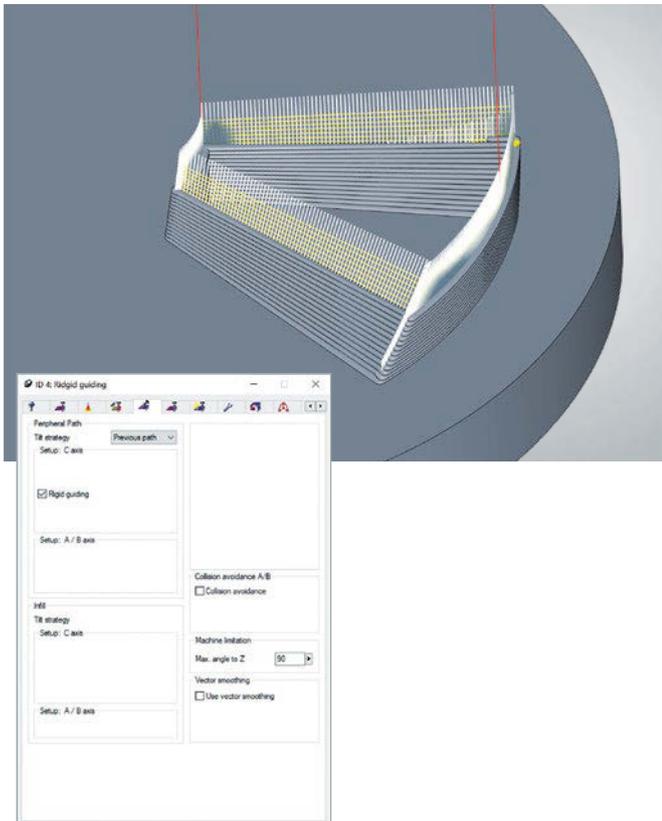
**Weave mode**



To apply material to contours or fill areas, there is now the “Weave” mode that can be used to generate a toolpath in a wave-shaped or zigzag movement. This allows the application area to be widened and the application thickness to be increased for the individual application movement. The continuous application also improves the metallurgical properties of the added material. This option can be used for 2D, 3D, and 5-axis deposition.

**Benefit:** More efficient deposition and improved process and material properties.

**Tilt strategy: Rigid guiding**



The “Rigid guiding” option can now be selected for the “Previous path” option under the tilt strategies in the 5-axis control. The strategy thus forces an inclination with the tool vector of the previous path, and smoothing of the tool vector is avoided for components with sharp corners.

**Benefit:** Improved tool orientation and additive deposition.

**Highlight**

# hyperMILL® BEST FIT – Intelligent Component Alignment at the Touch of a Button

Are you familiar with the problem? You spend a lot of time, effort, and patience aligning your stock or component on the machine, and, in the end, your finished component does not fit despite the care you have taken. We now have a simple and efficient solution for precisely this problem!

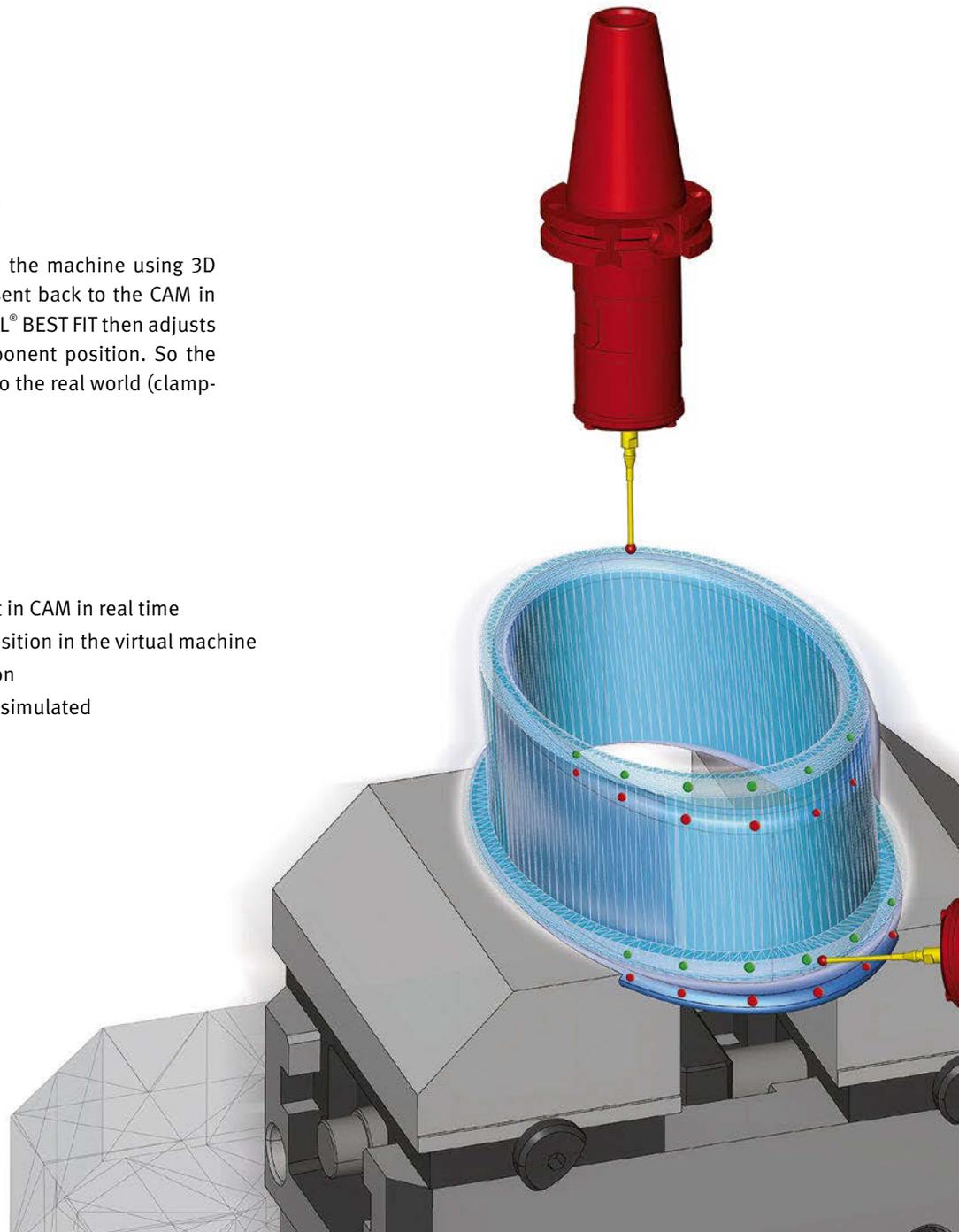
Thanks to *hyperMILL*® BEST FIT, the uncertainties relating to this critical interface are eliminated at the touch of a button. You will have no more surprises, such as unmachined areas with small allowances, when you open the machine doors after machining. With *hyperMILL*® BEST FIT, the process is safe, precise, and plannable.

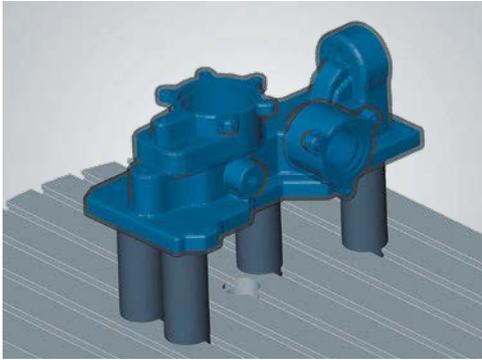
## Real-time alignment in CAM

The unaligned component is probed on the machine using 3D probing, and these probing points are sent back to the CAM in the form of a measuring report. *hyperMILL*® BEST FIT then adjusts the NC code exactly to the actual component position. So the virtual world (programming) is adapted to the real world (clamping), and not the other way around!

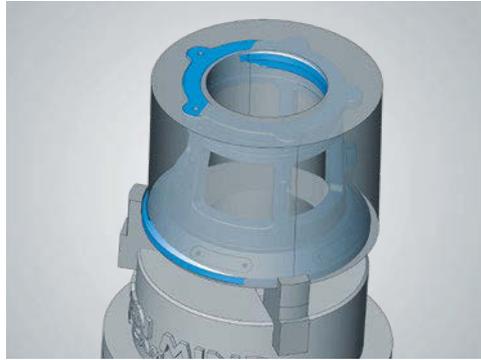
## Features

- Fast and reliable component alignment in CAM in real time
- Simulation of the actual component position in the virtual machine
- NC output on actual component position
- Real axis limitations and collisions are simulated and compensated for if necessary

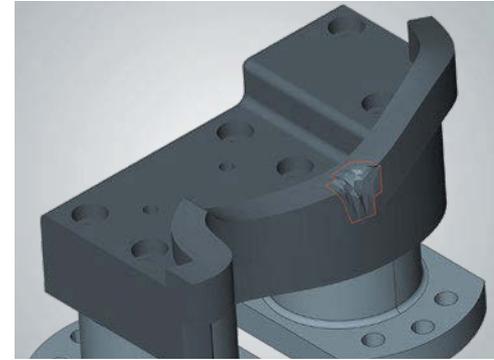




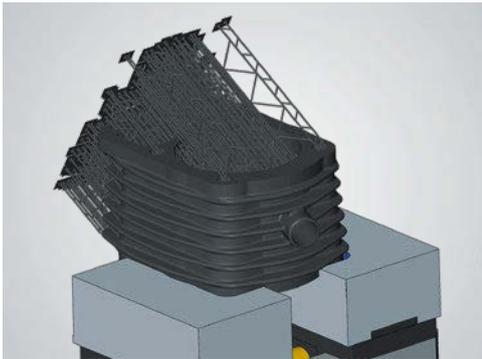
Cast components/welded components



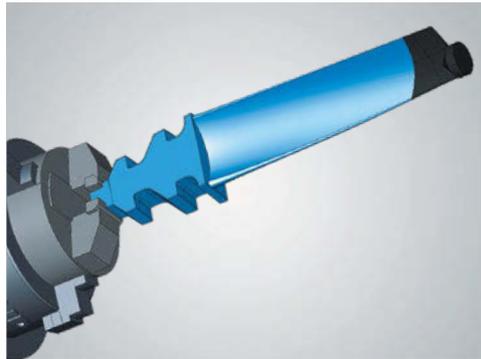
Imprecise stock



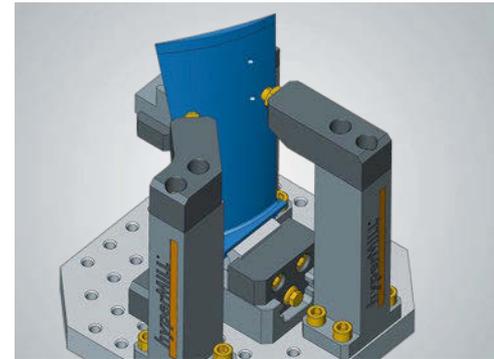
Second mounting/repair



Additive components



Forged components



Second mounting/repair

## Advantages

- Safe machining
- No more complex set-ups/special measuring equipment necessary
- Plannable setup times and processes
- Shorter processing times
- Set-up skills no longer required
- Reduced design effort → No auxiliary geometry required
- No adjustment to the controller
- Easy to change machining to another device



# **hyperMILL<sup>®</sup>**

VIRTUAL Machining

## **hyperMILL<sup>®</sup> VIRTUAL Machining – Safety first!**

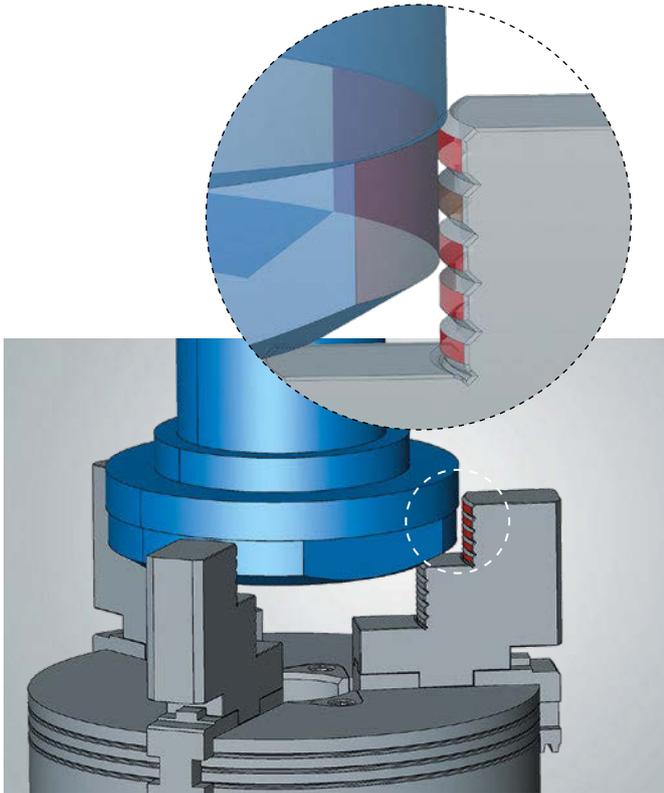
Start the future now, and take your production to the next level! With *hyperMILL<sup>®</sup> VIRTUAL Machining*, OPEN MIND has realized its vision of a perfect synthesis of the virtual and real world: a new dimension of post-processors and a simulation technology for the production of tomorrow.



**Highlight****New import formats**

The new *hyperCAD*®-S version offers three additional formats for file imports. SAT as standard ACIS text and OBJ and 3MF for importing mesh data. These file types can therefore be imported directly into *hyperCAD*®-S.

**Benefit:** More flexibility when importing data.

**Mating**

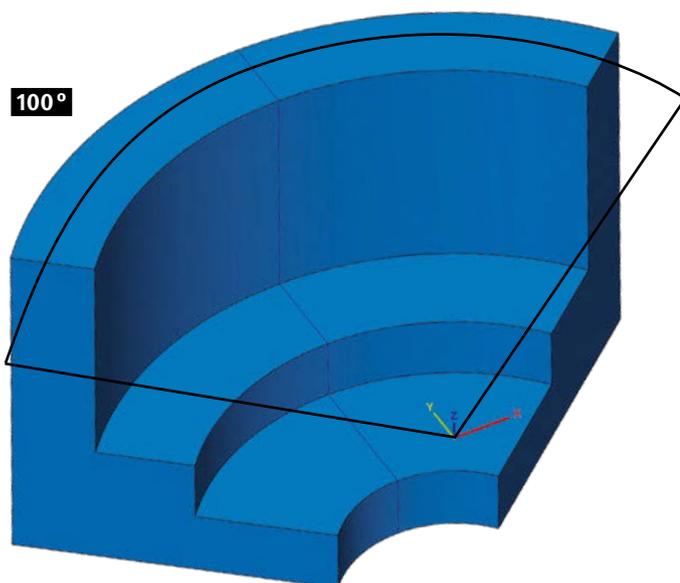
The new “Tangency” constraint allows cylindrical faces to now be aligned tangentially to each other.

**Benefit:** Alignment of cylindrical faces for clamping.

**Data import with templates**

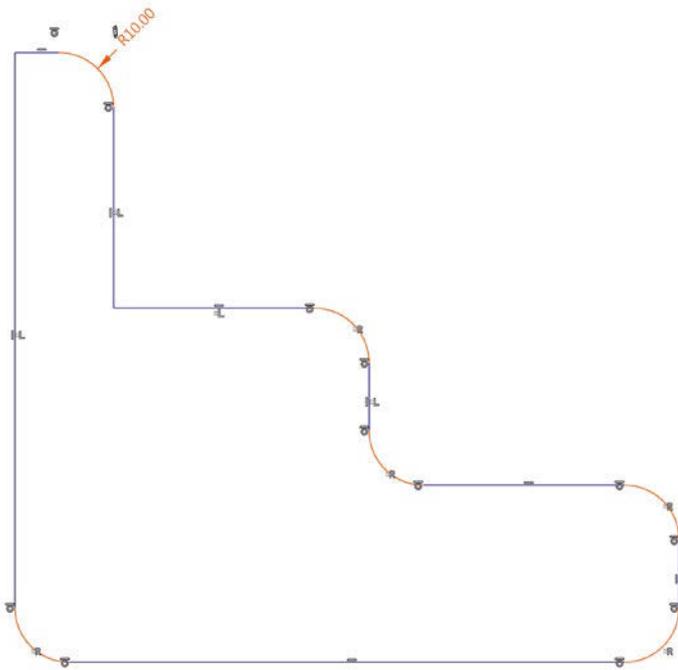
A template file can now be used for all non-native formats when importing data. This gives the user the option to define particular specifications for each format in a template (.hmct file).

**Benefit:** Customization of import standards and improved user-friendliness.

**Shapes – rotation**

The “Rotational” command now includes the “Symmetric” option, which ensures that the required angle range is applied equally to both rotation axes. This can be used for the rotational face, protrusion, and slot.

**Benefit:** Easily generate symmetric rotational shapes.



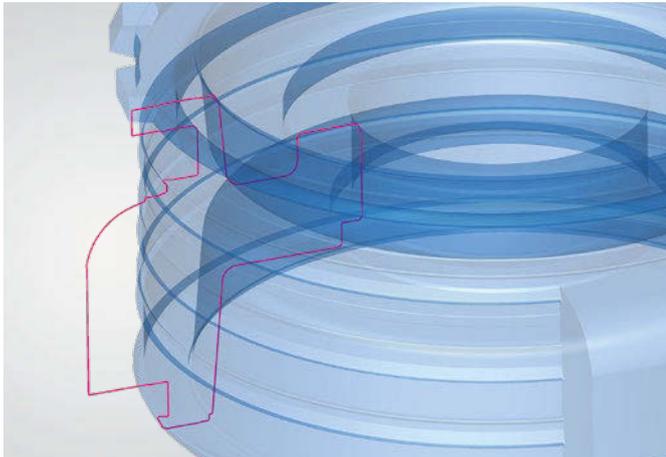
## Drafting with V-sketch

Two new constraints can be used when drafting with the V-sketch.

- Coincidence radius
- Coincidence length

This allows radii or line lengths to be controlled in a coincidental way.

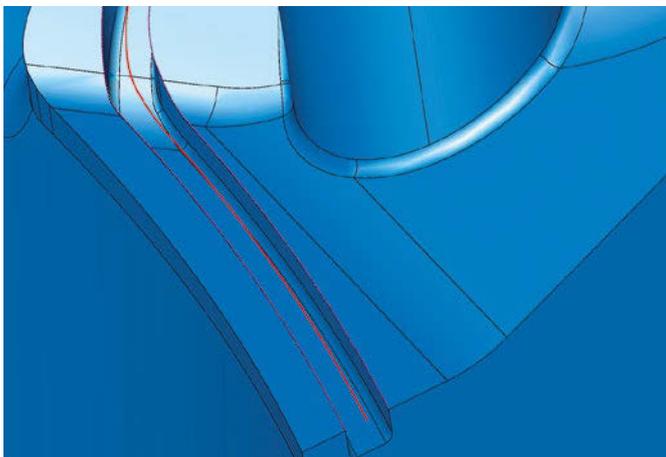
**Benefit:** Additional sketch constraints and simplified dimensioning.



## Shape contour

The new “Rotational” option also allows rotational contours to be created. They can be generated as polylines or as precise lines and arcs.

**Benefit:** Expanded range of functions for rotational geometries.



## Average curve

The new “Average” curve command generates a new, mean curve between two sets of curves. This is based on an isoparametric curve, calculated from the ruled face between the two selected curve sets. In this way, approximately average curves can be generated in the 2D and 3D space.

**Benefit:** Fast and easy creation of center curves between sections or guide curves.

## Create electrode

The creation of electrodes has been improved through the optimized selection of the raw material, as the user can now select three different options under properties when selecting the raw material.

- **Database height:** A raw material that has the smallest specified height is chosen. This option is required for the fixed, predefined Z values of raw materials.
- **Database height optimized with offset:** Corresponds to the first option with additional offset so that only a defined value has to be milled off
- **Electrode height with offset:** Here, the actual electrode height with an additional offset value is used as the raw material height for the stock model. This allows a bar stock to be used.

**Benefit:** Better stock management.

### Highlight

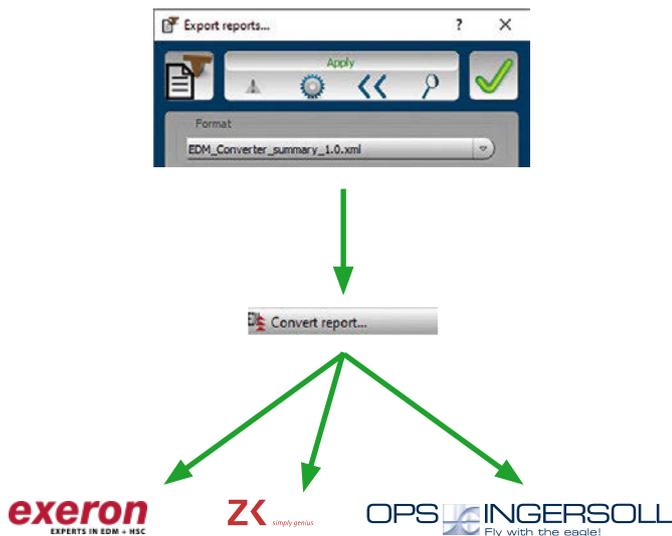
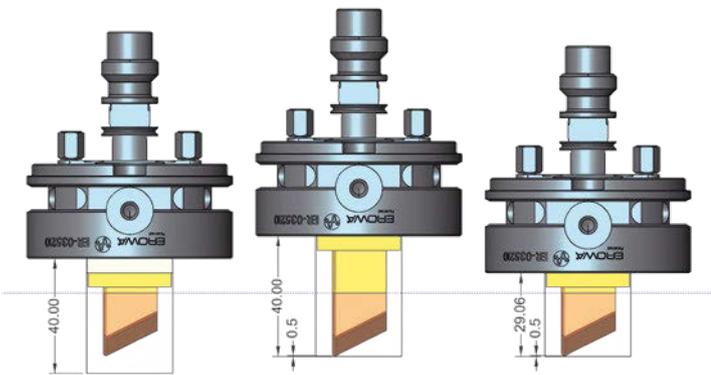
## hyperCAD®-S Electrode Converter

The *hyperCAD®-S* Electrode Converter can be used to create import files for EDM machines. The converter generates a corresponding import file for a specific EDM machine based on the XML file newly implemented in the Electrode module. The generated file can be loaded directly into the machine, and all necessary technology parameters, such as project data, reference position, spark gap, orbit, material, and electrode type are included. The converter supports single electrodes, as well as rotational and virtual electrodes.

The intuitive and clear operation guarantees fast and safe process transfer to EDM machines. The following manufacturers and software products are supported with the delivery of version 2021.2:

- Exeron – Exoprog
- Zimmer & Kreim – Alphamoduli
- OPS-INGERSOLL – PowerSpark Editor and Multiprog

**Benefit:** Optimal process support for EDM machines.



**Headquarters**

**OPEN MIND Technologies AG**  
Argelsrieder Feld 5 • 82234 Wessling • Germany  
Phone: +49 8153 933-500  
E-mail: [Info.Europe@openmind-tech.com](mailto:Info.Europe@openmind-tech.com)  
[Support.Europe@openmind-tech.com](mailto:Support.Europe@openmind-tech.com)

**UK**

**OPEN MIND Technologies UK Ltd.**  
Units 3 • Bicester Business Centre  
Telford Road • Bicester • Oxfordshire OX26 4LD • UK  
Phone: +44 1869 290003  
E-mail: [Info.UK@openmind-tech.com](mailto:Info.UK@openmind-tech.com)

**USA**

**OPEN MIND Technologies USA, Inc.**  
1492 Highland Avenue, Unit 3 • Needham MA 02492 • USA  
Phone: +1 888 516-1232  
E-mail: [Info.Americas@openmind-tech.com](mailto:Info.Americas@openmind-tech.com)

**Brazil**

**OPEN MIND Tecnologia Brasil LTDA**  
Av. Andromeda, 885 SL2021  
06473-000 • Alphaville Empresarial  
Barueri • Sao Paulo • Brasil  
Phone: +55 11 2424 8580  
E-mail: [Info.Brazil@openmind-tech.com](mailto:Info.Brazil@openmind-tech.com)

**Asia Pacific**

**OPEN MIND Technologies Asia Pacific Pte. Ltd.**  
3791, Jalan Bukit Merah • #04-08  
Singapore 159471 • Singapore  
Phone: +65 6742 95-56  
E-mail: [Info.Asia@openmind-tech.com](mailto:Info.Asia@openmind-tech.com)

**China**

**OPEN MIND Technologies China Co. Ltd.**  
Suite 1608 • Zhong Rong International Plaza  
No. 1088 South Pudong Road  
Shanghai 200120 • China  
Phone: +86 21 588765-72  
E-mail: [Info.China@openmind-tech.com](mailto:Info.China@openmind-tech.com)

**India**

**OPEN MIND CAD/CAM Technologies India Pvt. Ltd.**  
No. 610 and 611 • 6<sup>th</sup> Floor • 'B' Wing  
No. 6, Mittal Tower, M.G. Road  
Bengaluru 560001 • Karnataka • India  
Phone: +91 80 2676 6999  
E-mail: [Info.India@openmind-tech.com](mailto:Info.India@openmind-tech.com)

**Japan**

**OPEN MIND Technologies Japan K.K.**  
Albergo Musashino B101, 3-2-1 Nishikubo  
Musashino-shi • Tokyo 180-0013 • Japan  
Telephone: +81-50-5370-1018  
E-mail: [info.jp@openmind-tech.co.jp](mailto:info.jp@openmind-tech.co.jp)

**Taiwan**

**OPEN MIND Technologies Taiwan Inc.**  
Rm. F, 4F., No.1, Yuandong Rd., Banqiao Dist.  
New Taipei City 22063 • Taiwan  
Phone: +886 2 2957-6898  
E-mail: [Info.Taiwan@openmind-tech.com](mailto:Info.Taiwan@openmind-tech.com)

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](http://www.mum.de)



We push machining to the limit

[www.openmind-tech.com](http://www.openmind-tech.com)