

SolidCAM – The Solid Platform for Manufacturing

SolidCAM 2024 New Functionalities

June 2024



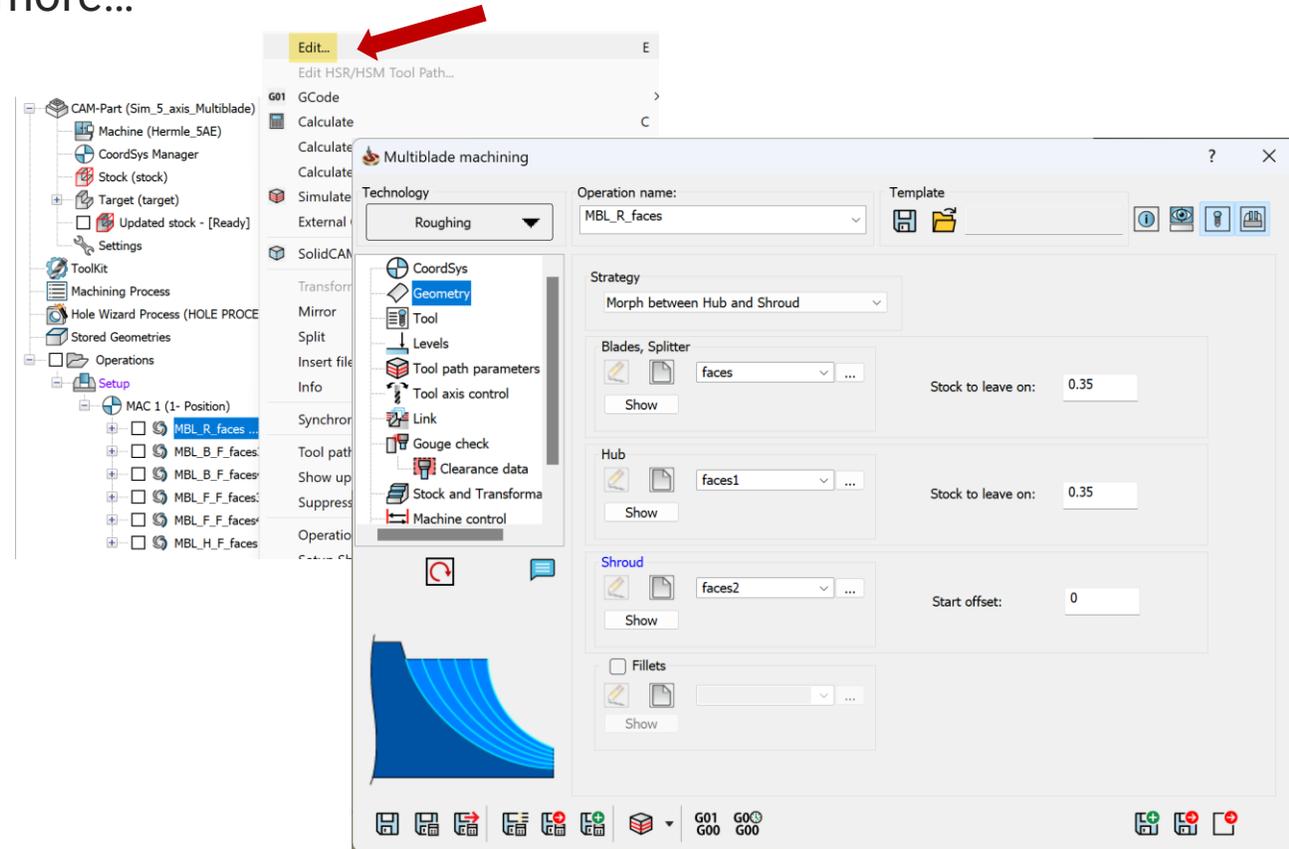
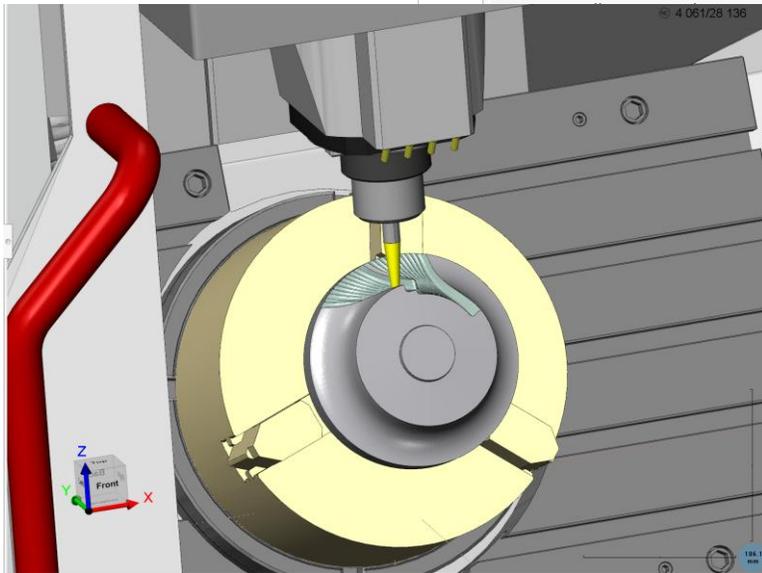
The unique, revolutionary Milling technology
imachining®
patent by SolidCAM

SolidCAM +
Mill Turn & Swiss

SolidCAM
Additive Manufacturing

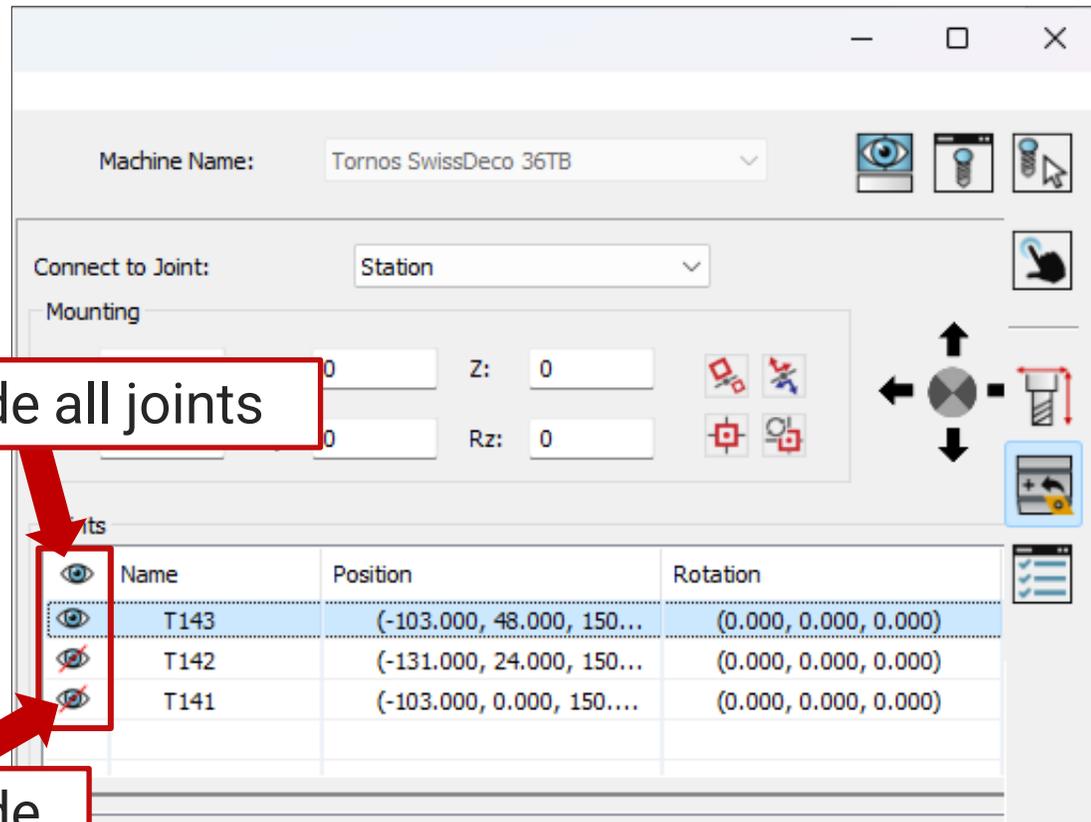
General- Greatly Improved Performance Time on Opening and Editing Operations

- ❑ Vastly improved the speed performance when opening or editing operations in many operations such as Multi-Axis Machining, HSS, Swarf Machining and more...



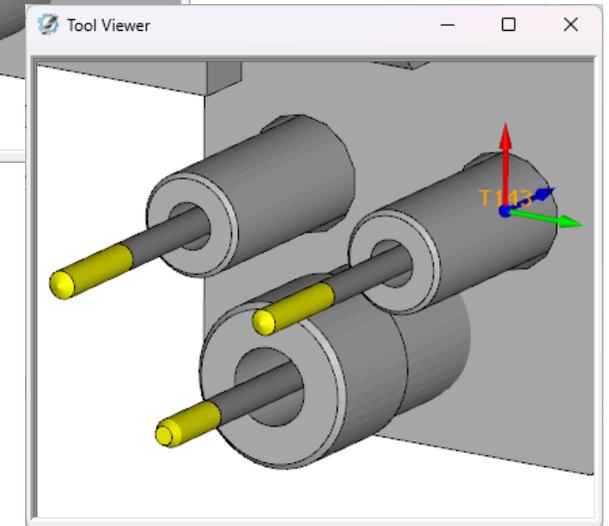
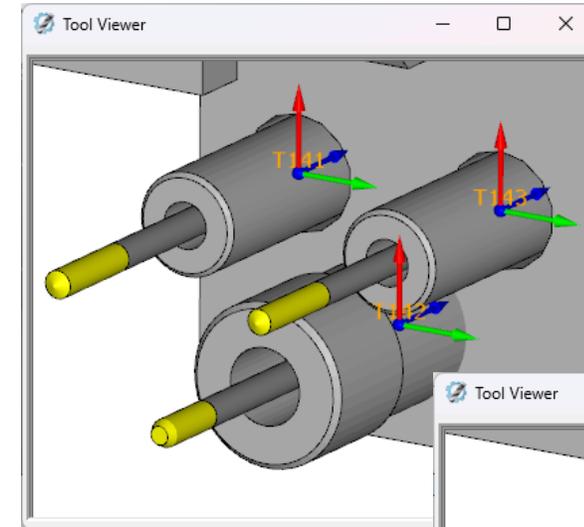
ToolKit – Show/Hide joints

- Improved visibility experience in Tool Viewer with **Show/Hide** joints on tool components



Show/Hide all joints

Show/Hide



ToolKit – Added Manufacturer and Mfc. Catalog number

- ❑ Added **Manufacturer** and **Mfc. Catalog number** to Properties page
- ❑ Pre-defined list of Manufacturer is available, but it is possible to write custom too!

Manufacturer: SOLIDCAM
Mfc. catalog number: 560-1018

Price: 0
Mass: 0
Relation to Adaptor: NONE
Description:

Hyperlink

Component Color

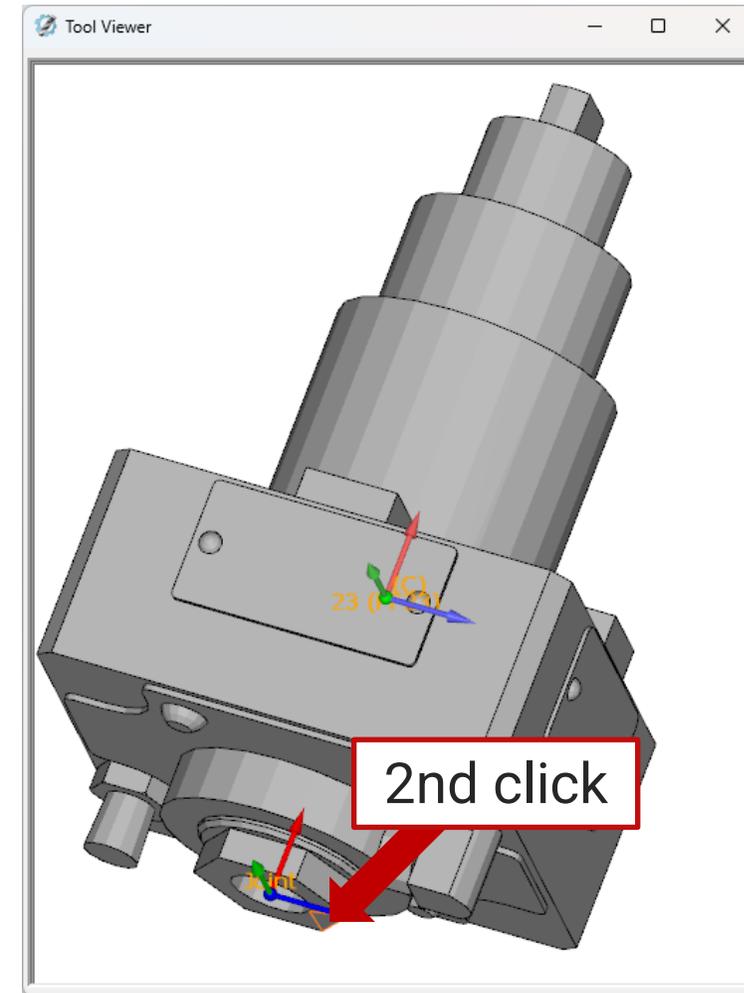
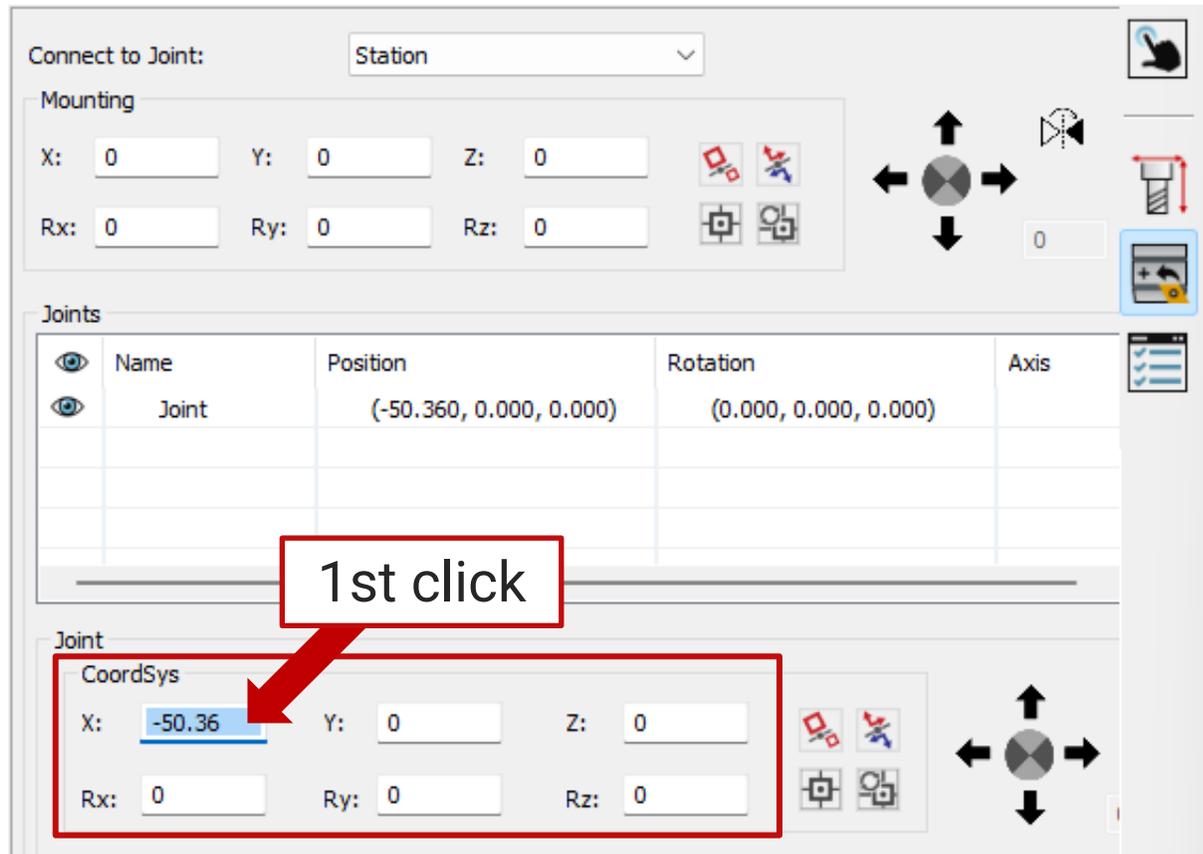
Quantity: 1 Assume max quantity

BOEHLERIT
CERAMTEC
CERATIZIT
EMUGE
FRAISA
GUHRING
HACHENBACH
HAHN+KOLB
HAM-ANDREAS MAIER
HOFFMANN GROUP
HOFMANN & VRATNY
INDEX
INGERSOLL
INOVATOOLS
ISCAR
JONGEN
KENNAMETAL
KOMET GROUP
KORLOY
KYOCERA
LEISTRITZ HIGH PRECISION TOOLS
LMT FETTE
LMT KIENINGER
MAPAL
MITSUBISHI MATERIALS
MOLDINO TOOL ENGINEERING, LTD
NIKKEN
OSG
PAUL HORN



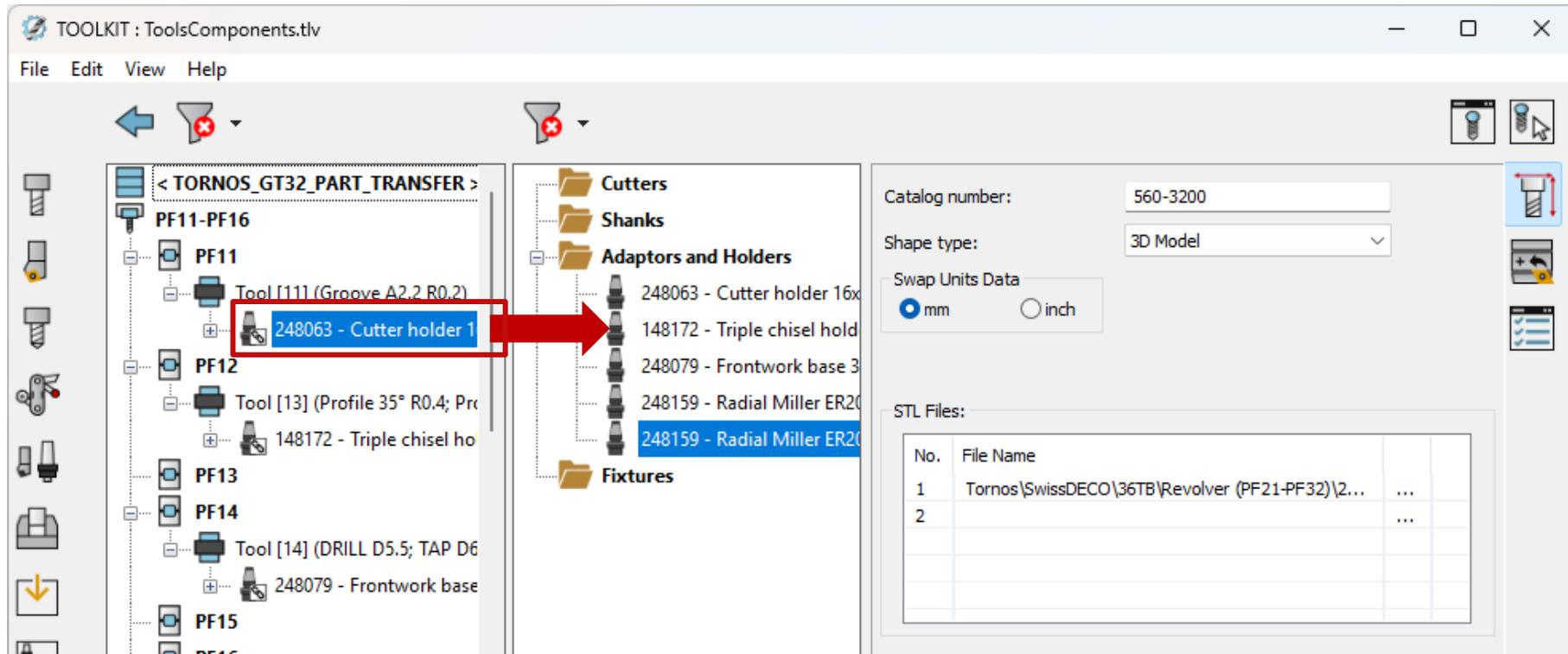
ToolKit –Joint origin and orientation by clicking on 3D Model

- ❑ Faster joint definition
- ❑ Pre-measure relevant distances is not necessary



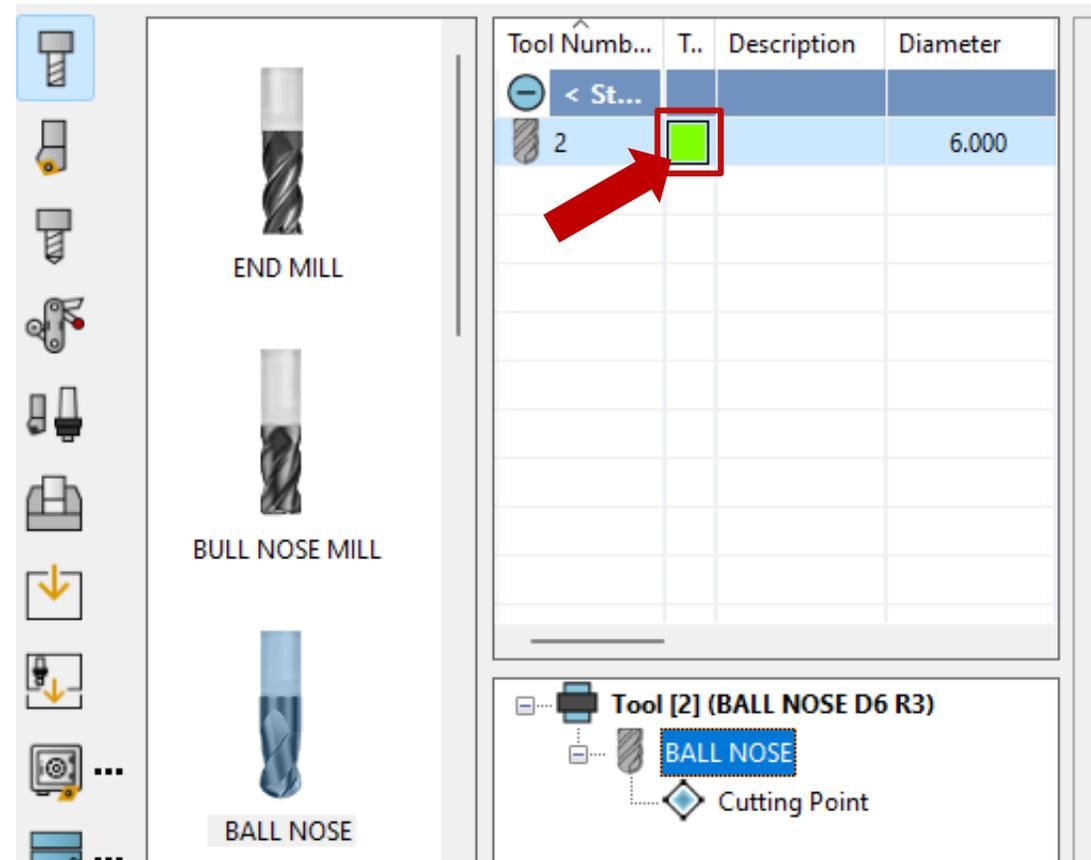
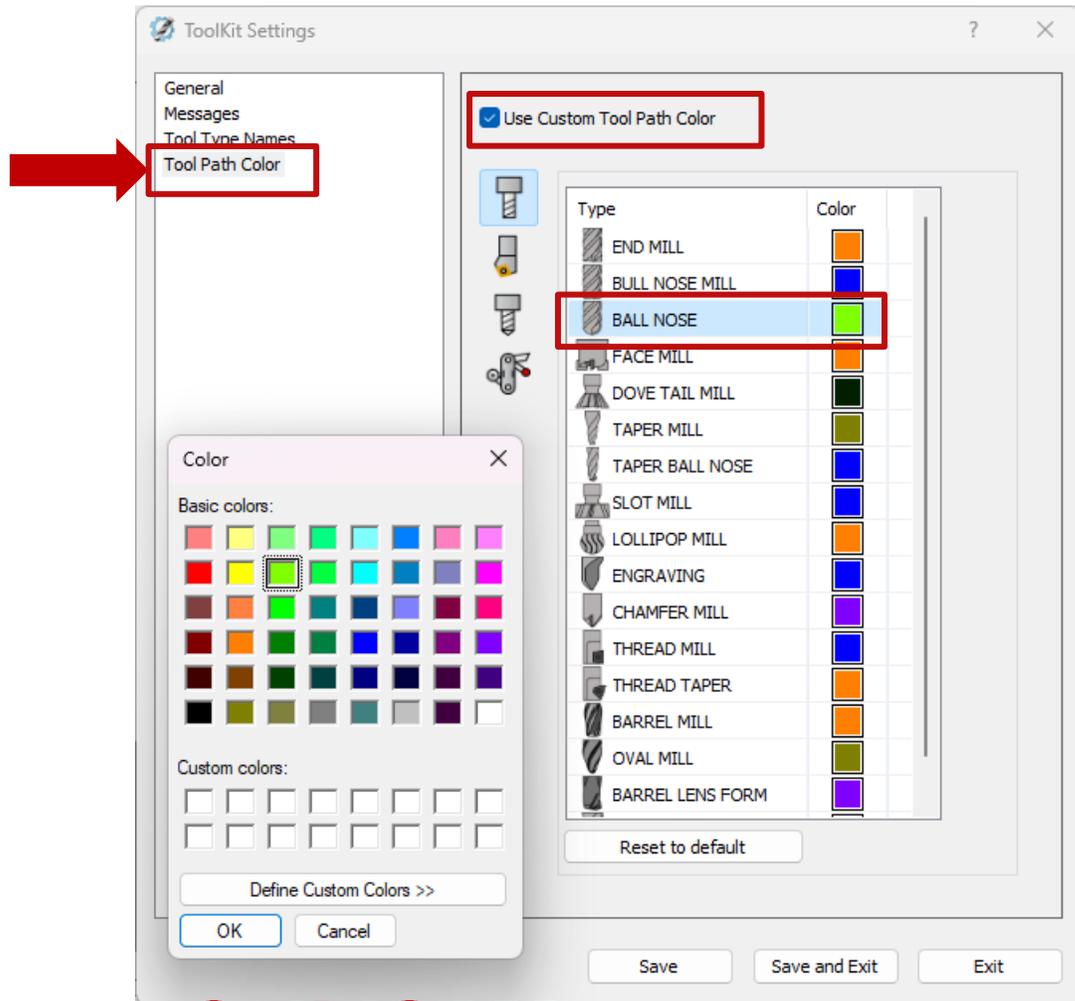
ToolKit – Import components from Assembly libraries

- Added possibility to import components from Assembly libraries into a Tool Components Library (TLV)



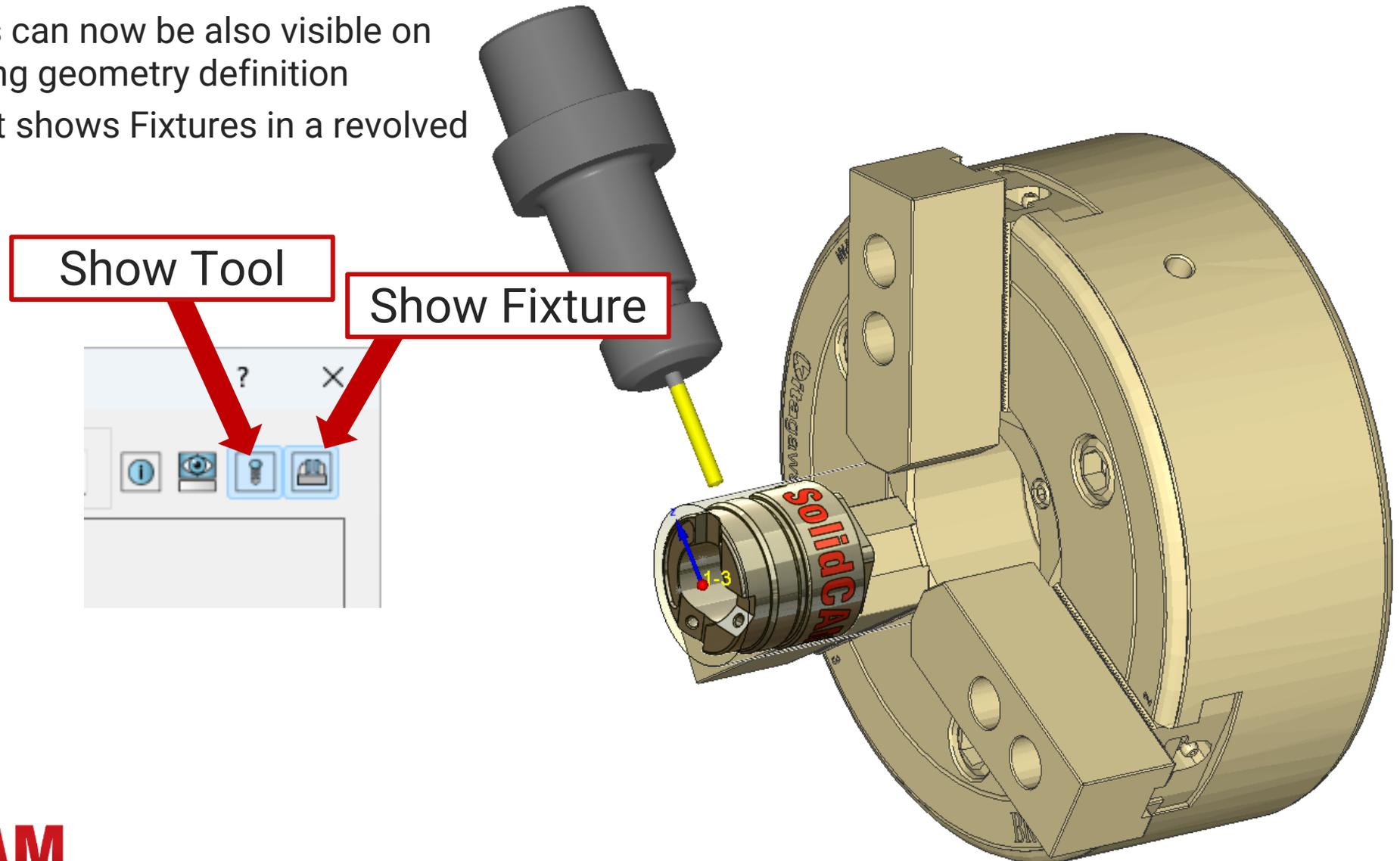
ToolKit Settings – Use Custom Tool-Path color

- Added possibility to use pre-defined custom color



Job – Ability to see Fixture in CAD environment

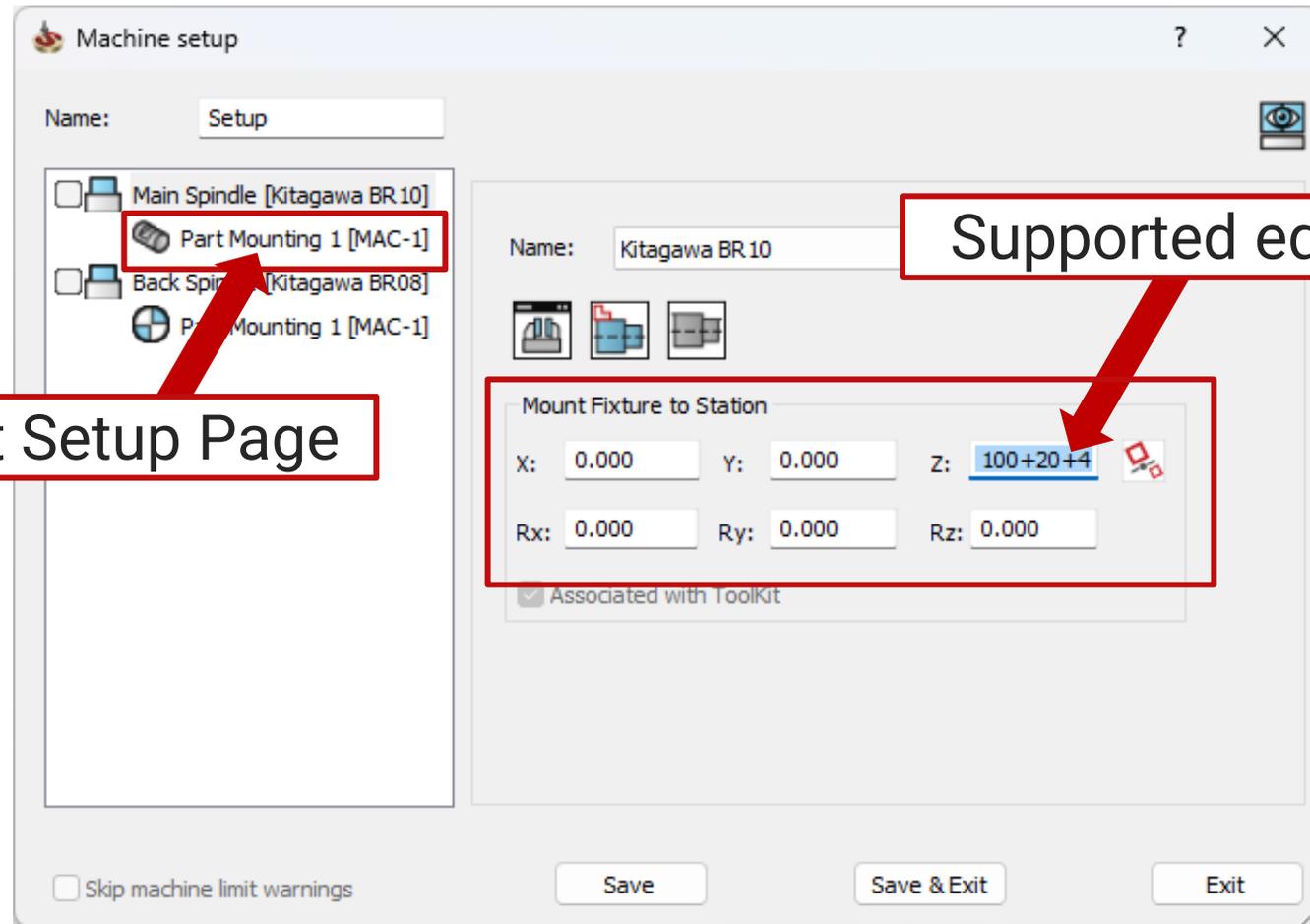
- ❑ Selected Fixtures can now be also visible on the job level during geometry definition
- ❑ In Turning Jobs it shows Fixtures in a revolved state



WATCH VIDEO



Machine Setup – Expanded equations in value fields



...also in Part Setup Page

Supported equations



MCO – Shift Table Reference point

- ❑ Having ability to shift reference point of Table (point of interest) when performing Table Movement in **Part CS**.
- ❑ Suitable for any Part Transfer routines in **Mill-Turn** and **Swiss-Type**

Operation name: TRF - BS Clamp position

Process:

- Start definition
- MS Reference
- BS Reference
- BS Open Jaws
- TRS-Mode ON
- Rapid W position (Part CS)**
- Device
- Movement
- Dwell (sec)
- Rotation
- Spindles Synchronization
- Check Torque
- Activate Air Through Spindle
- Working Mode
- Axes Synchronization
- Clamp
- Working Time (sec)

Properties:

Name	Value
Device	Back Spindle
Reference Point	Fixture Zmin (0, 0, -126.699)
	Device CoordSys (0, 0, 0)
	Station CoordSys (0, 0, 0)
	Fixture Zmin (0, 0, -126.699)
	Fixture Zmax (0, 0, 17)

Machine Preview:

Fixture Zmin

Device CS

25

MAC 1-1

Properties:

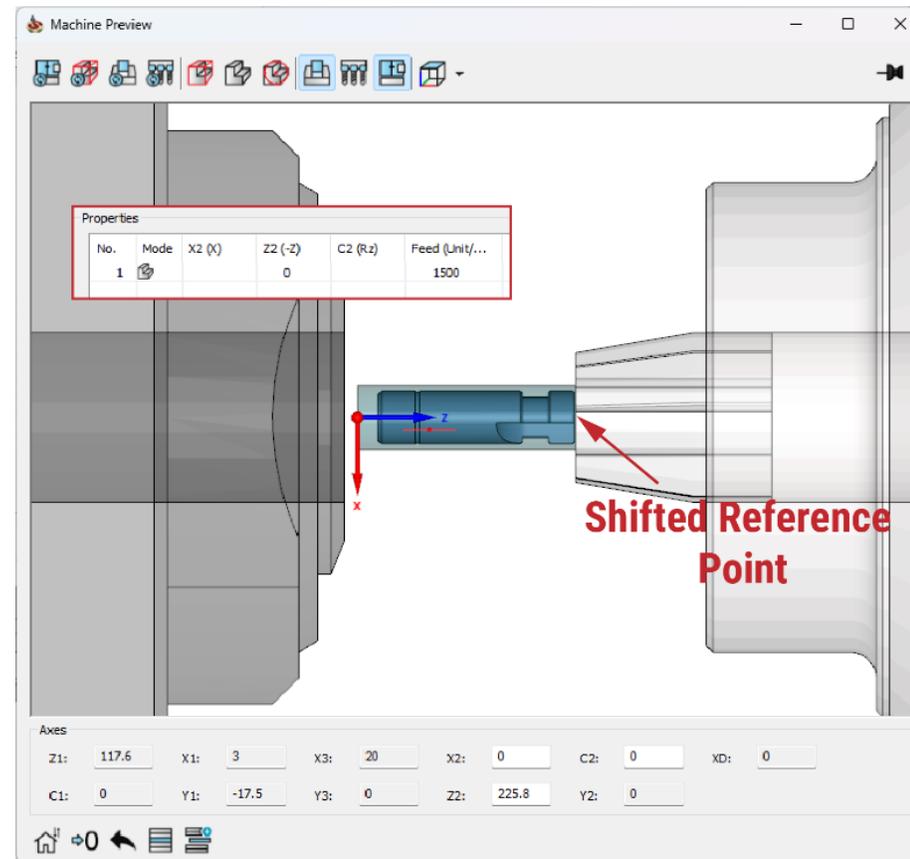
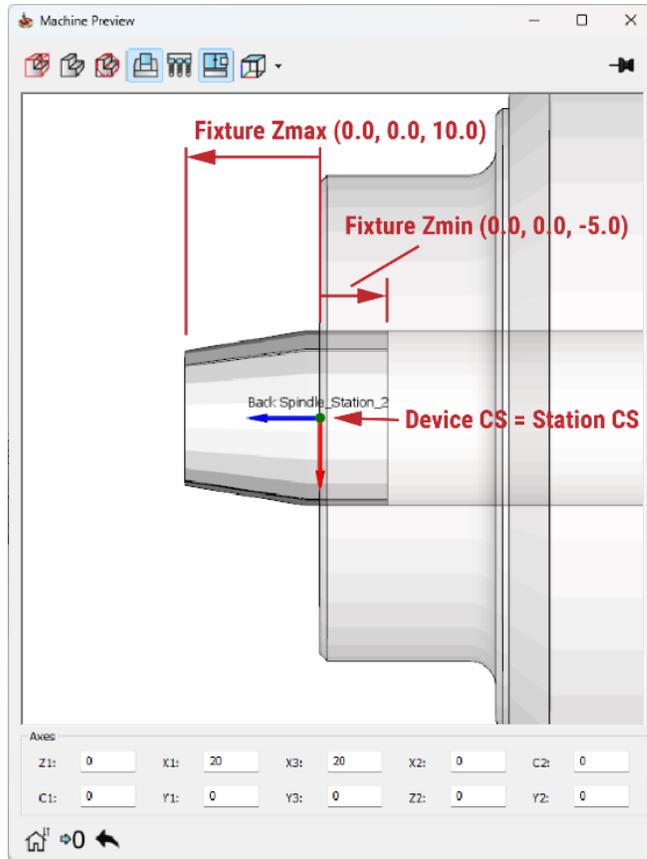
No.	Mode	W (Z)	C2 (-Rz)	Feed (Unit/...)
1		P 25		RAPID

0 C1: 0 C2: 0 TE1: 0

210 W: -1446.30 WZW: 0

MCO – Shift Table Reference point

- ❑ Shifts have pre-calculated **Fixture Zmin** and **Fixture Zmax** point for easy use
- ❑ It is possible to select **Non-cutting** point (will be listed if defined in ToolKit)



The case when Extension collet used on Swiss-Type

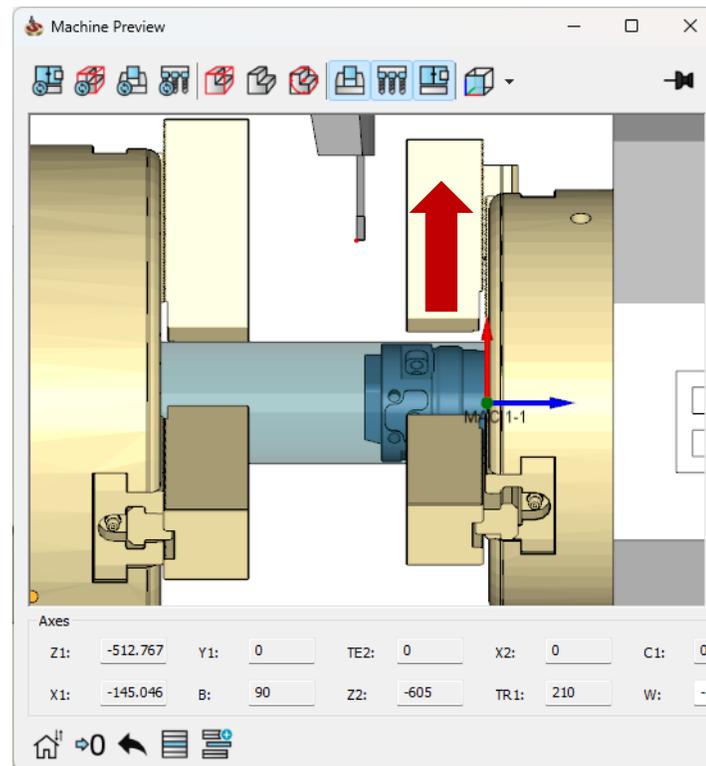


MCO – OPEN/CLOSE of Jaws is simulated

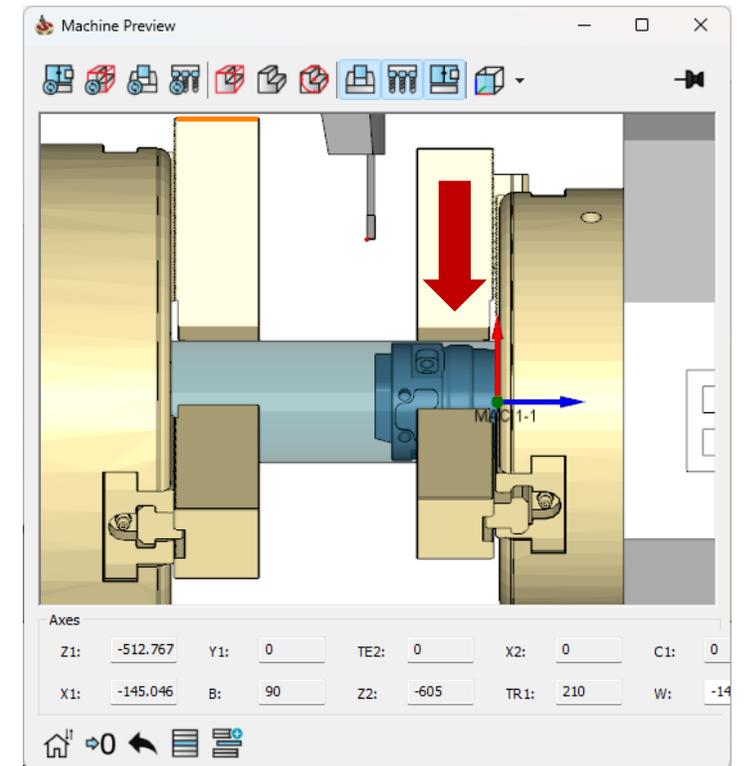
- ❑ Jaws **OPEN** and **CLOSE** is now shown in **Machine Preview** and simulated in **Machine Simulation**
- ❑ **OPEN/RELEASE STOCK** position is axis value defined in **ToolKit**
- ❑ **CLOSE/CLOSE ON STOCK** position is axis value defined in **Machine Setup**



WATCH VIDEO



Name	Value	Ne
Device	Back Spindle	
Reference Point	Device CoordSys (0, 0, 0)	
Clamp	OPEN	



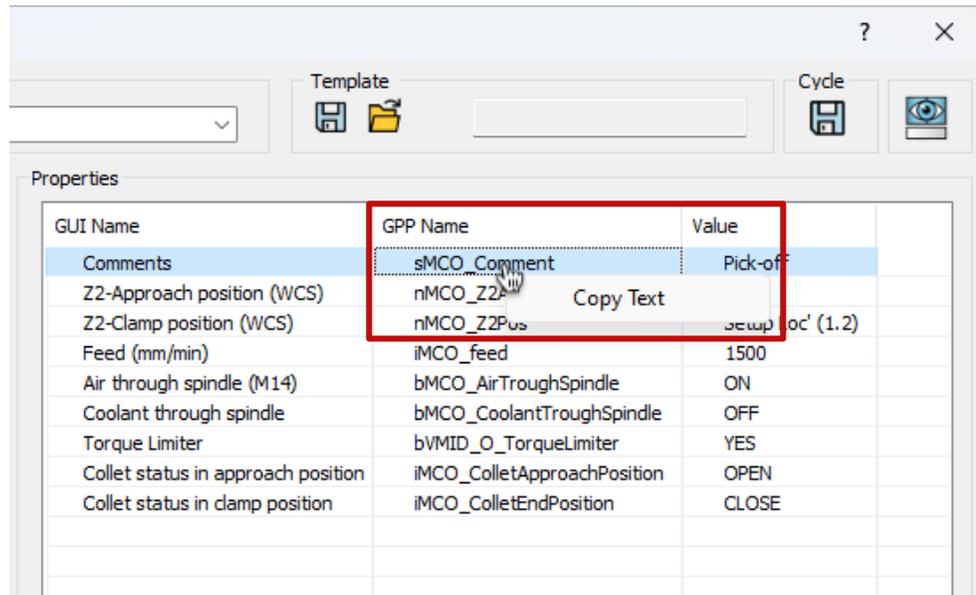
Name	Value	Ne
Device	Back Spindle	
Reference Point	Device CoordSys (0, 0, 0)	
Clamp	CLOSE	



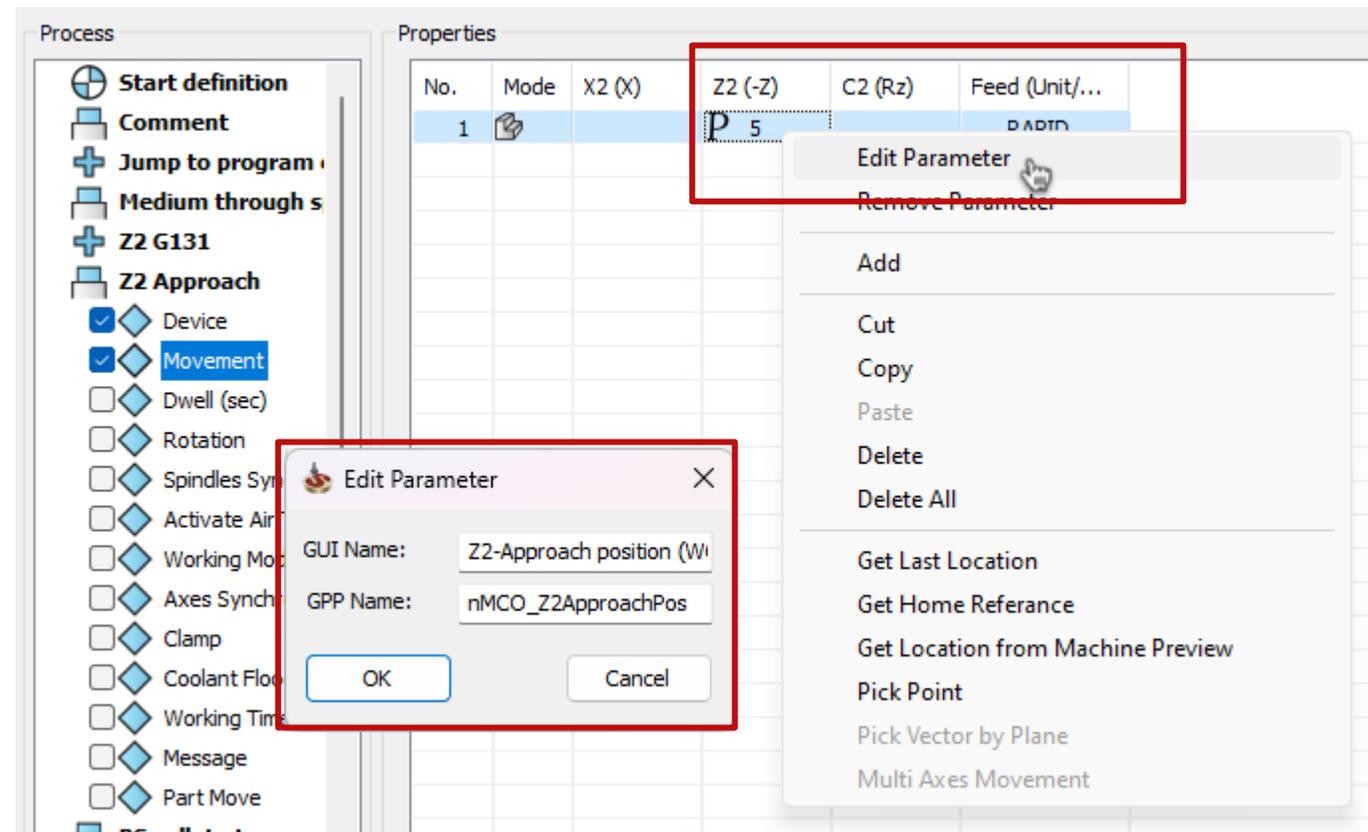
SolidCAM

The Solid Platform for Manufacturing

MCO – Improvements in Cycles



Easy copy of GPP Name



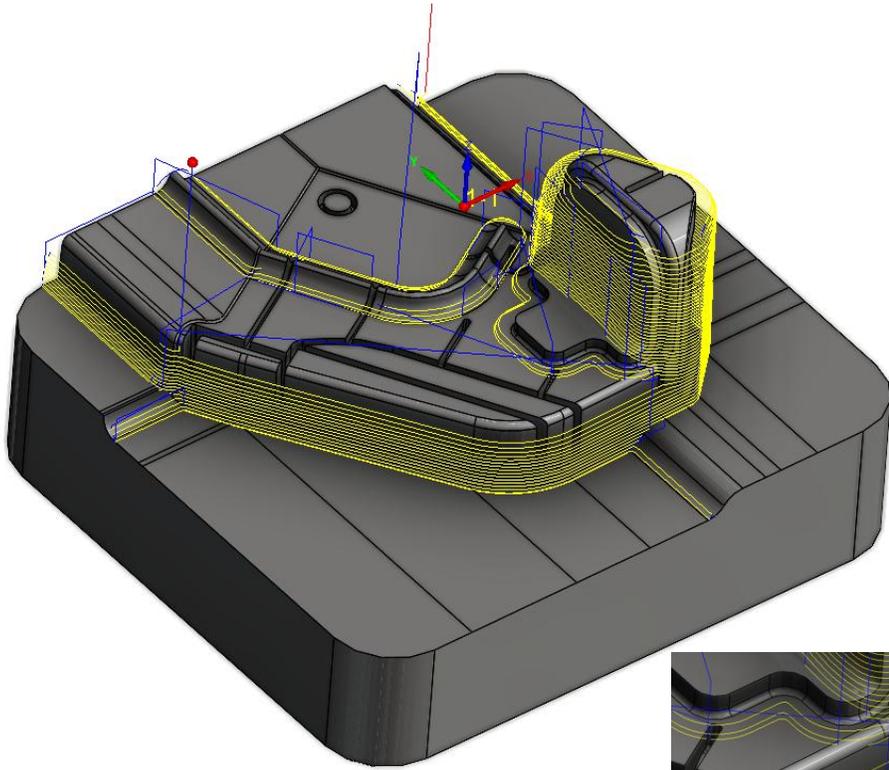
Ability to Edit Parameter

Pro 3D HSM - Highlights

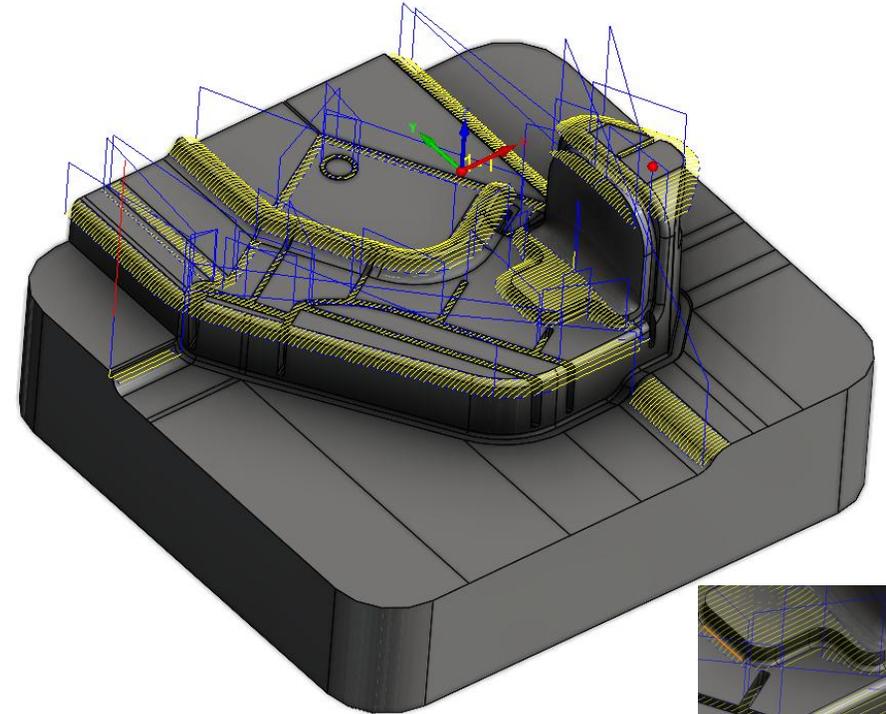
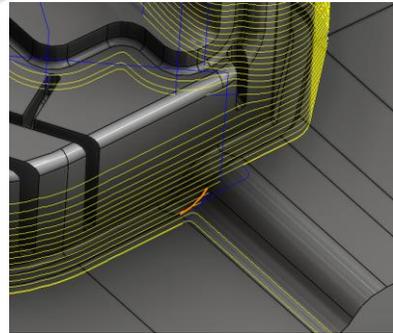
- ❑ **Pro 3D HSM** is High Speed Machining technology Generates semi-finishing and finishing toolpaths quickly and efficiently on any given machining surfaces, including complex 3D models or prismatic models.
- ❑ **Automatic Collision-Free Toolpaths:** Automatically generates collision-free toolpaths with holder and arbor, using infeed cutting for optimized links and generating true arcs to reduce NC blocks.
- ❑ **Precision 3D Boundaries:** Utilizes 3D boundaries for precise toolpath trimming, allows variable surface offsets, and user-defined cut levels in various strategies, excluding flat areas in specific approaches.
- ❑ **Flexible Toolpath Definitions:** Provides options for defining overlap, excluding undercut areas, and setting individual cutting methods, particularly in steep/shallow and combined strategies.
- ❑ **Optimized Feed Rates:** Optimizes feed rates at corners and during ascending/descending movements for better control, improved tool life, and enhanced surface finish.
- ❑ **Enhanced Performance and Flexibility:** Ensures efficient semi-finishing and finishing toolpaths on complex 3D or prismatic models, offering flexibility and precision in Mold component machining.



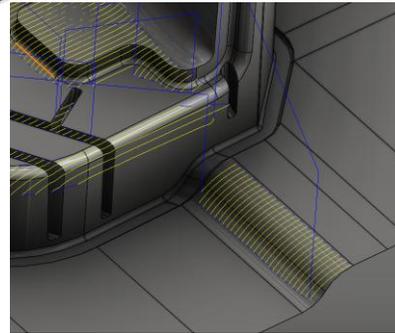
WATCH VIDEO

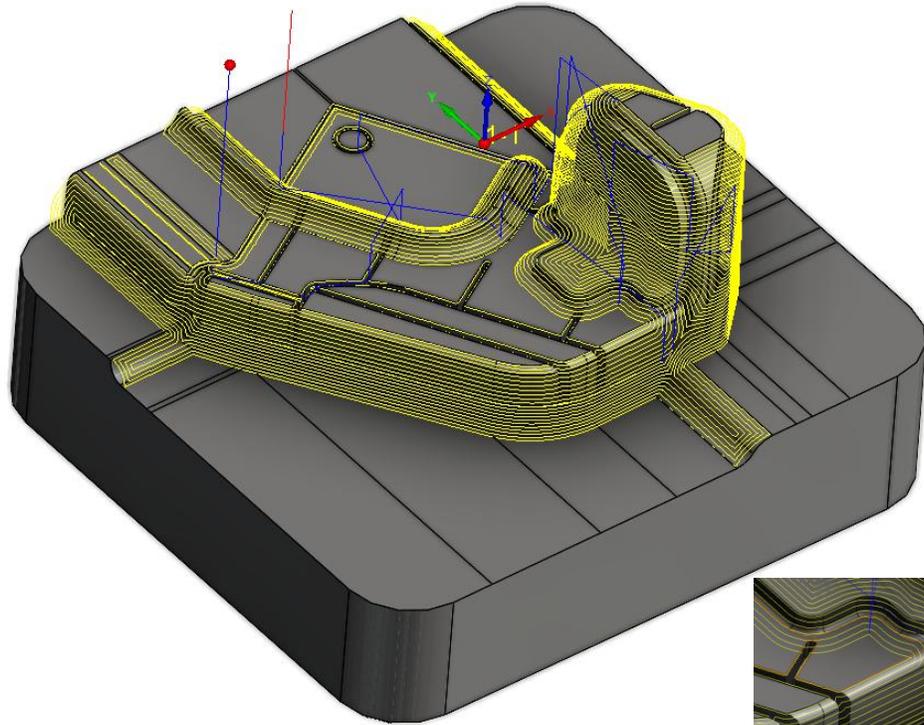


CONSTANT Z

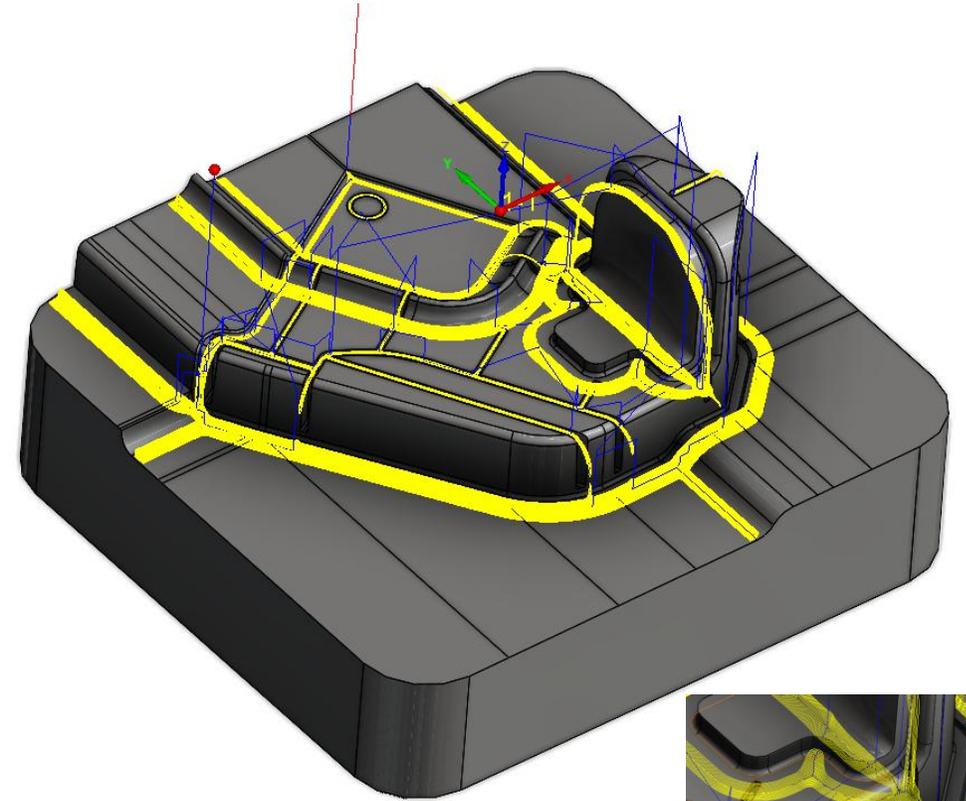


LINEAR

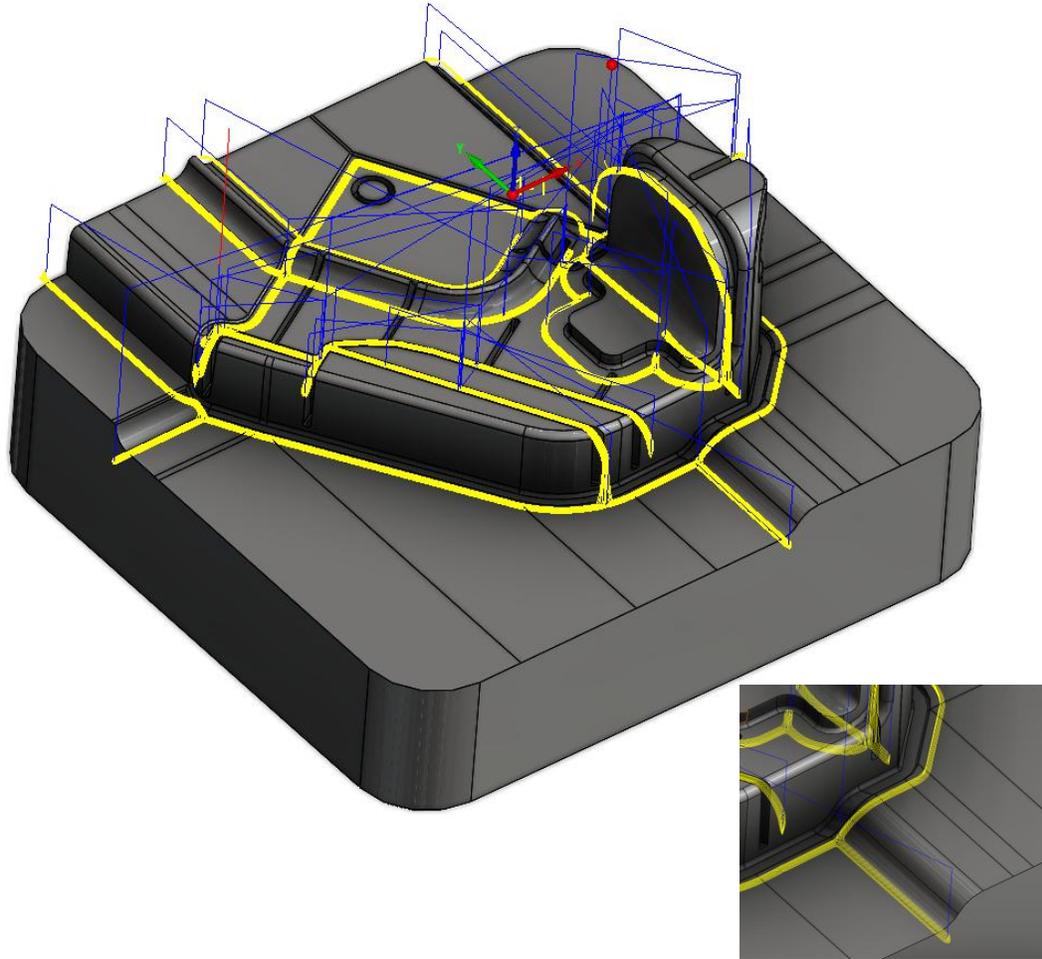




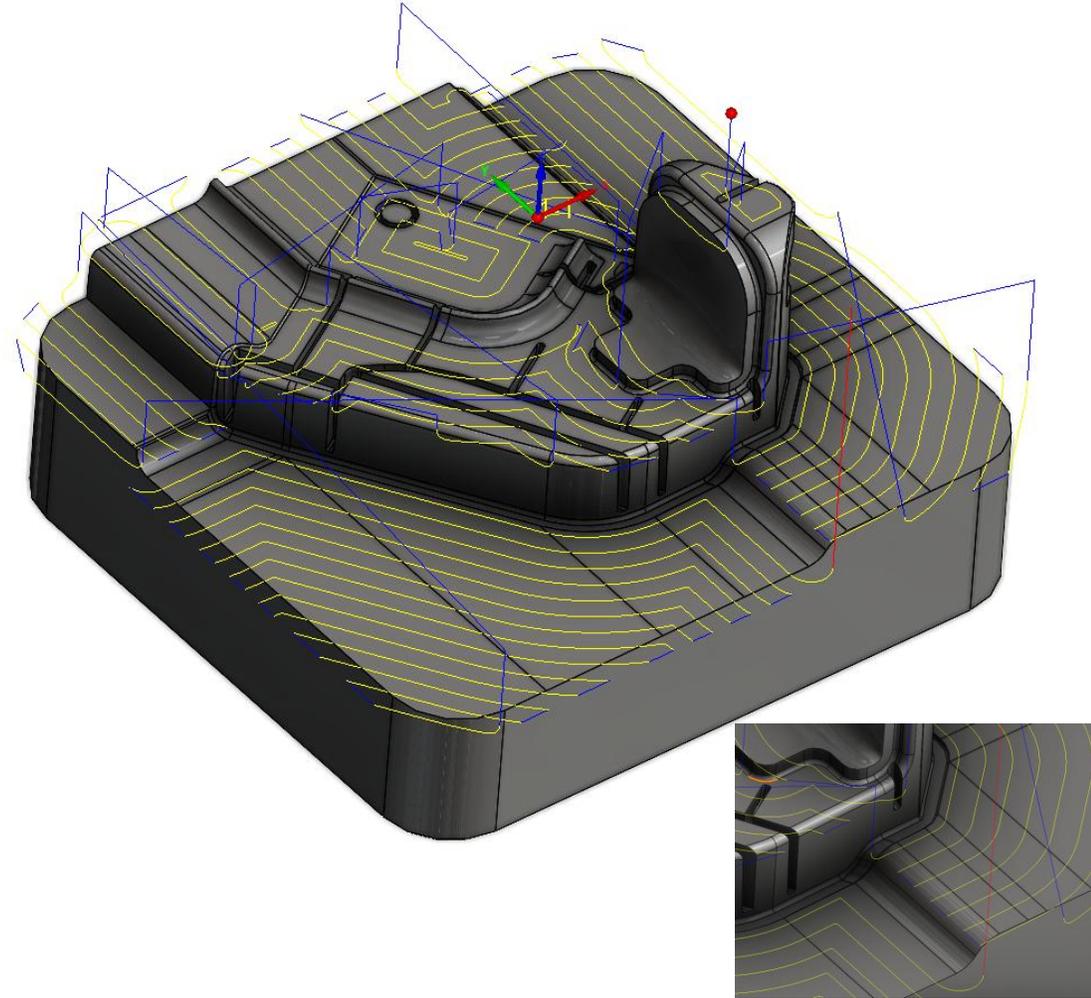
CONSTANT STEPOVER



CONSTANT STEPOVER REST FINISHING

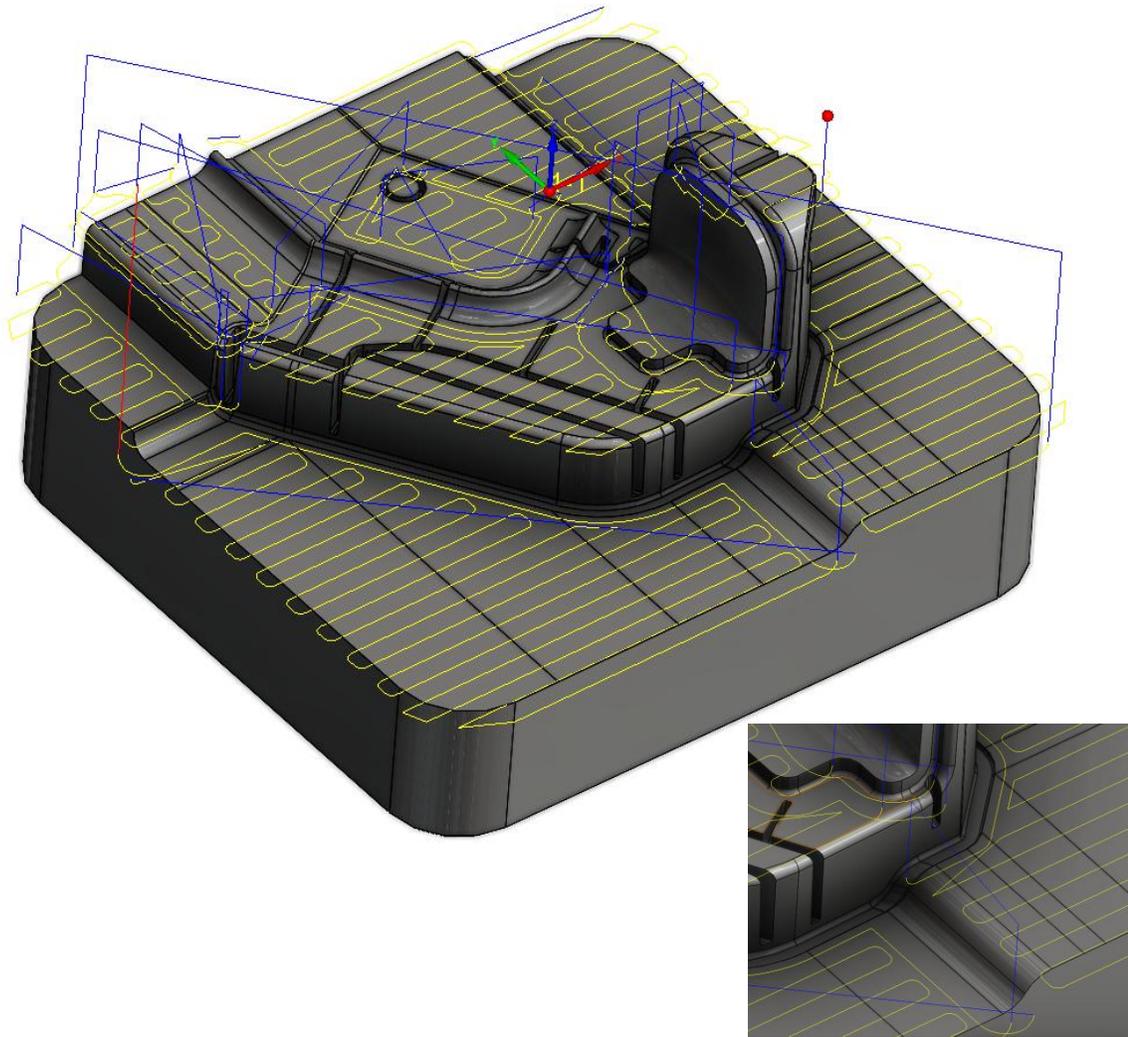


PENCIL MILLING

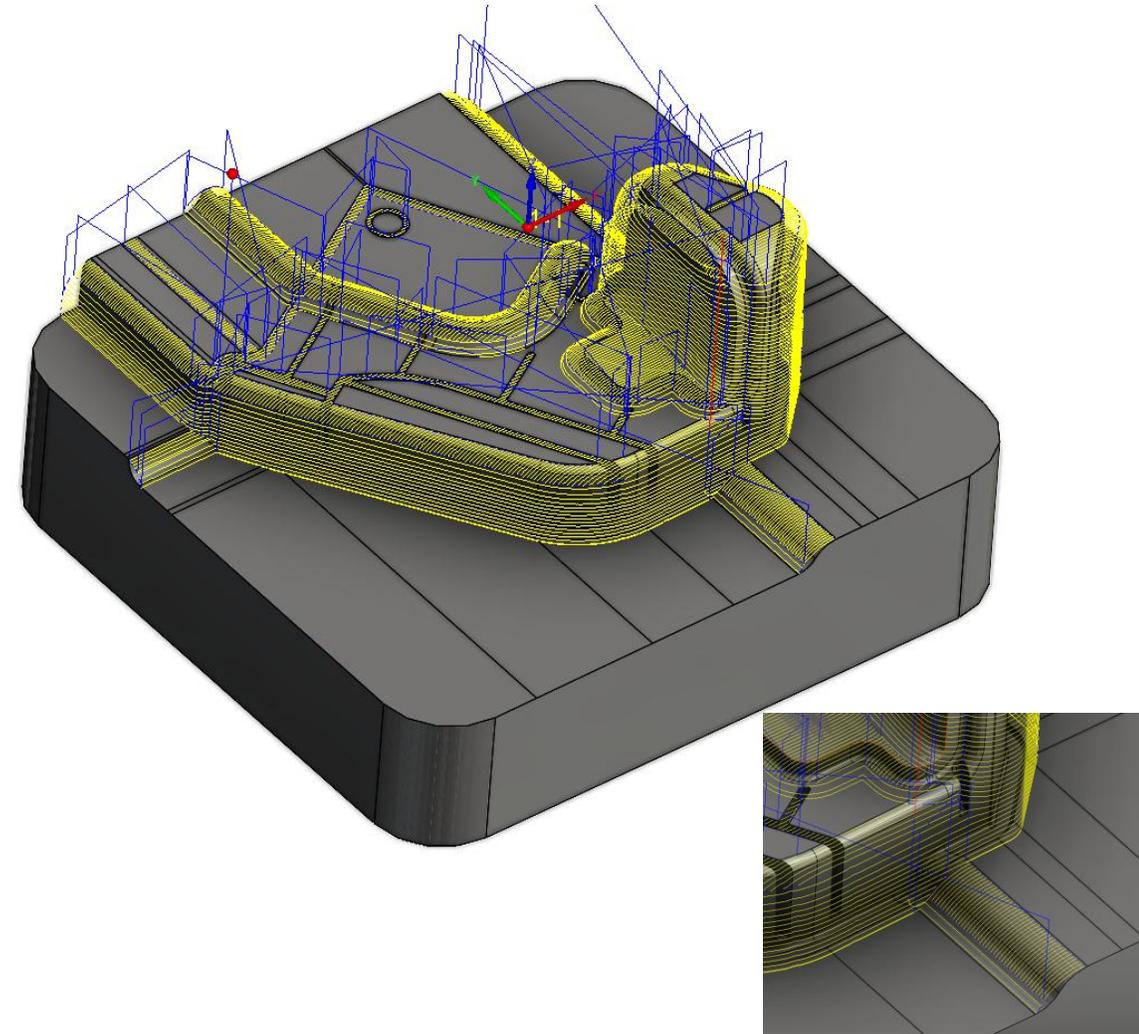


HORIZONTAL MACHINING - CONTOUR

Pro 3D HSM - Strategies

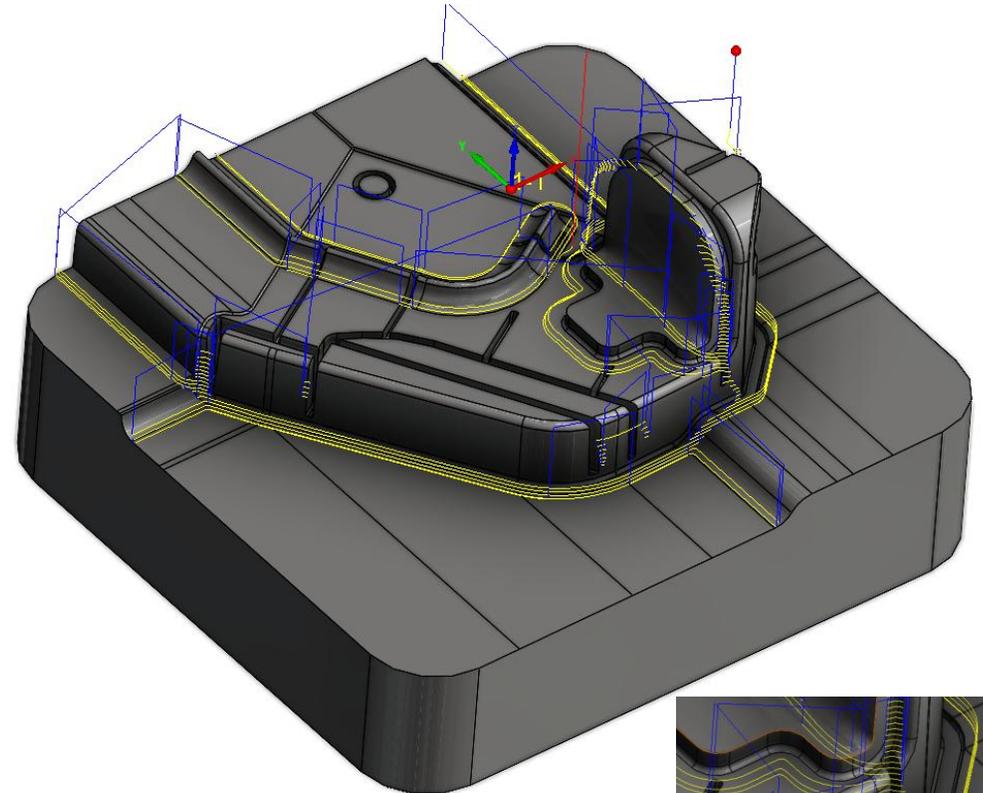
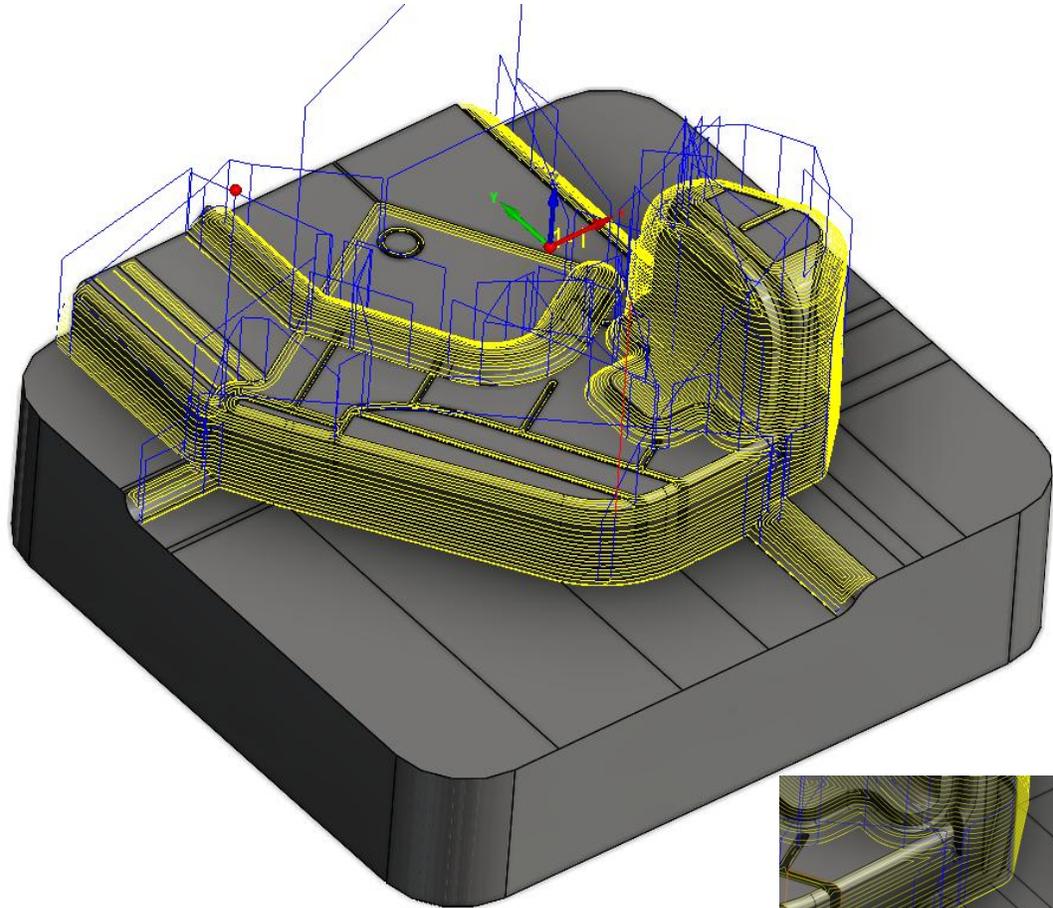


HORIZONTAL MACHINING - HATCH



COMBINED MACHINING - LINEAR

Pro 3D HSM - Strategies



COMBINED MACHINING – CONSTANT STEPOVER

CONSTANT Z – REST MACHINING

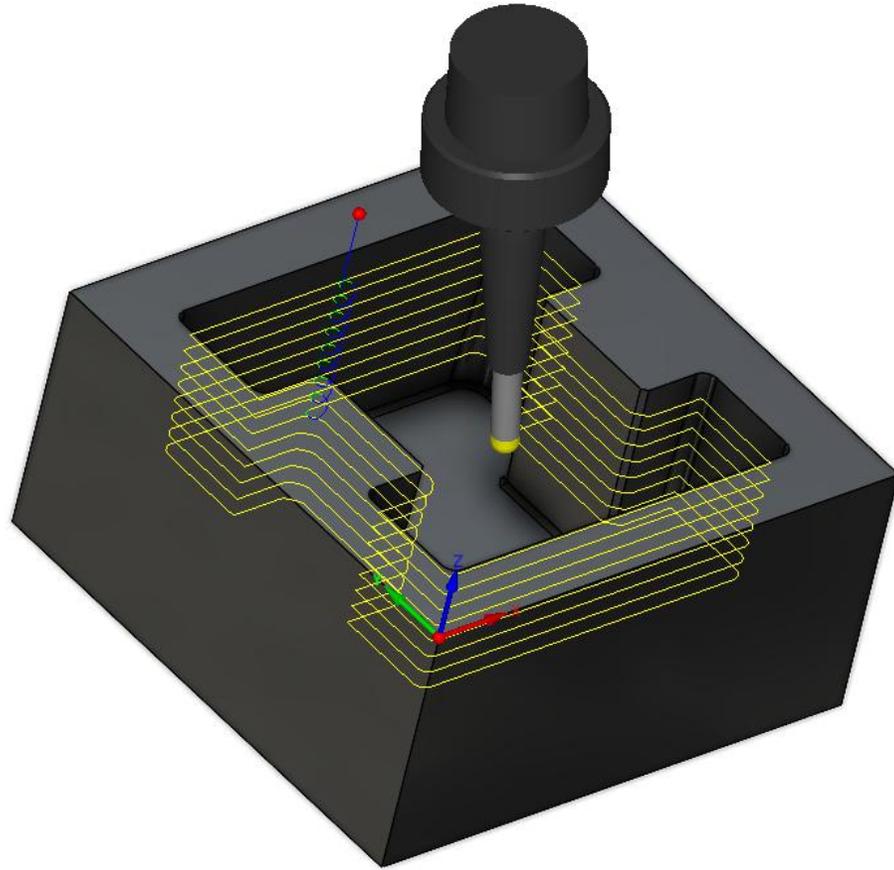
Undercut Milling – MultiAxis

- ❑ Multiaxis Undercut Milling is designed for machining both undercut and non-undercut areas of vertical or near-vertical surfaces in Sim 5-axis mode. It is primarily used for semi-finishing or finishing process.
- ❑ This technology slices the machining surfaces (target) at each stepdown to create a constant Z pattern.
- ❑ Multiaxis Undercut Milling allows you to generate toolpaths either exclusively in undercut areas or within defined constraint boundaries, which can be easily created by selecting the surfaces.
- ❑ It automatically generates collision-free toolpaths and offers a semi-automated process that may require minimal user intervention for fine-tuning.
- ❑ The Optimized Collision-Free Tilting mechanism allows users to define whether to use rotary or tilt movements to avoid collisions within user-defined limits.
- ❑ Ball Nose , Taper Ball Nose & Lollipop Tools are Supported.

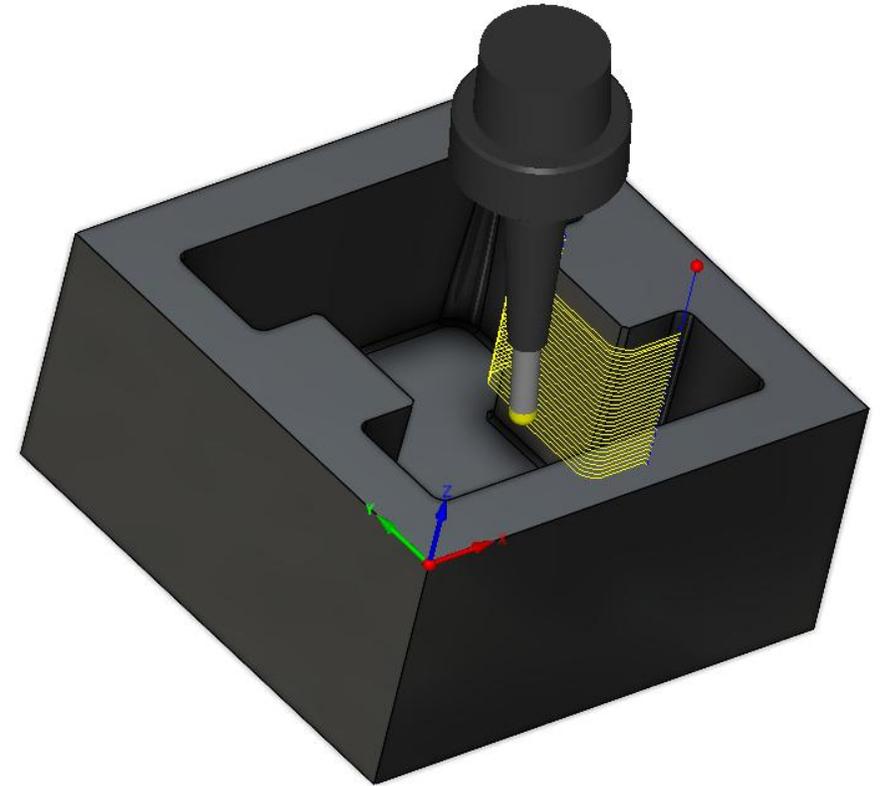


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Undercut Milling – MultiAxis

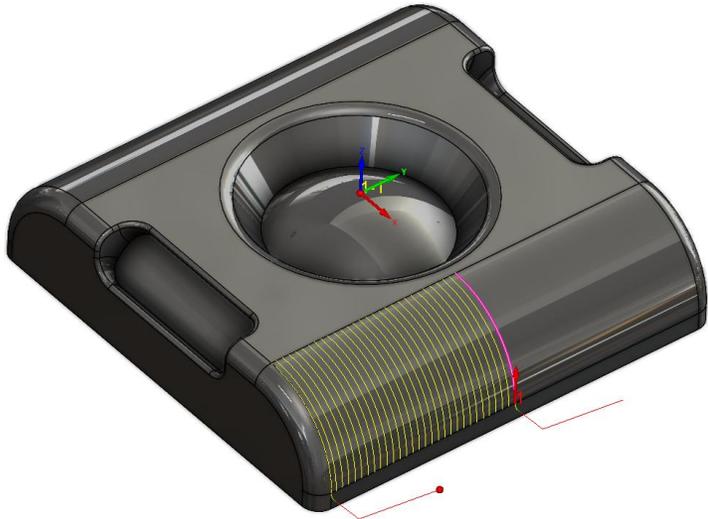


COMPLETE PART WITH UNDERCUTS



ONLY UNDERCUT MACHINING

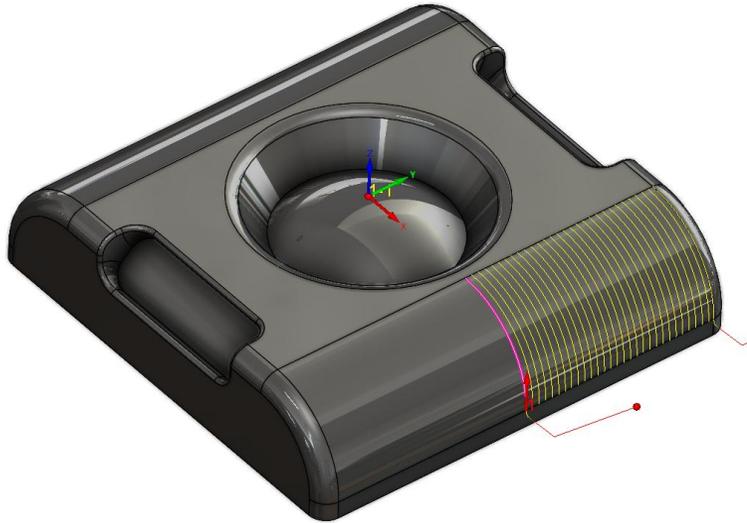
Geodesic Machining – Machining area relative to drive curve



Machining area relative to drive curve

Direction:

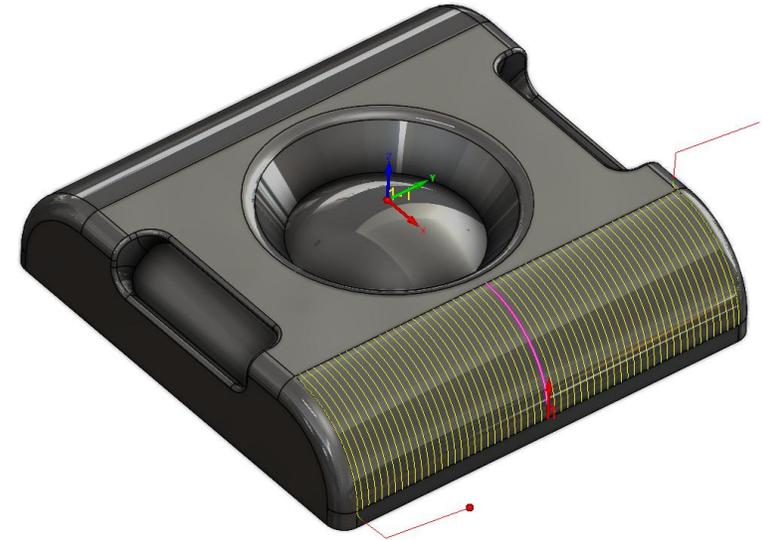
Left



Machining area relative to drive curve

Direction:

Right



Machining area relative to drive curve

Direction:

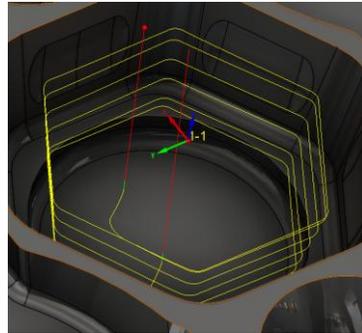
Both



Flexible Toolpaths with Drive Curve: Geodesic Enables toolpath creation on either side of the drive curve for closed boundaries or split areas, providing user control and flexibility.

**WATCH VIDEO**

SWARF Milling – Spiral Pattern

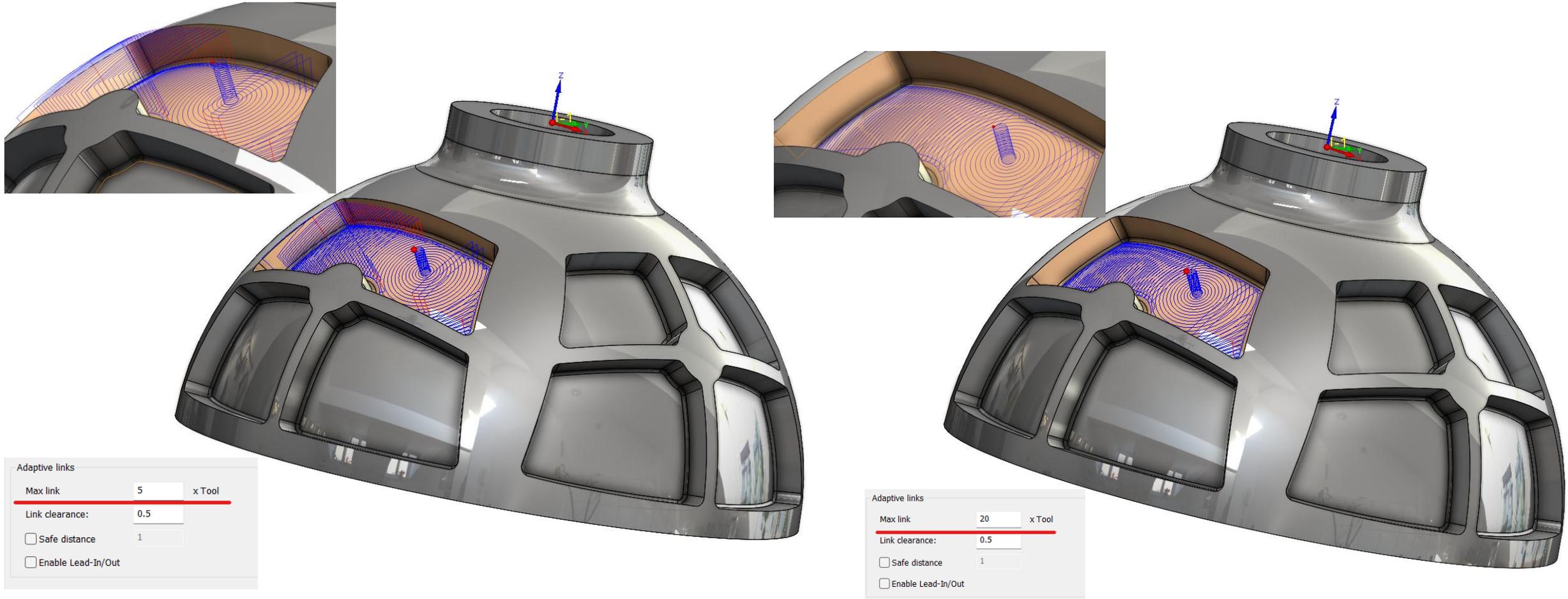


Spiral Cutting Method: Swarf Machining uses a spiral pattern for multiple slices on closed contours, resulting in a long spiral toolpath that avoids stepdown or te Dover marks with a single entry and exit.



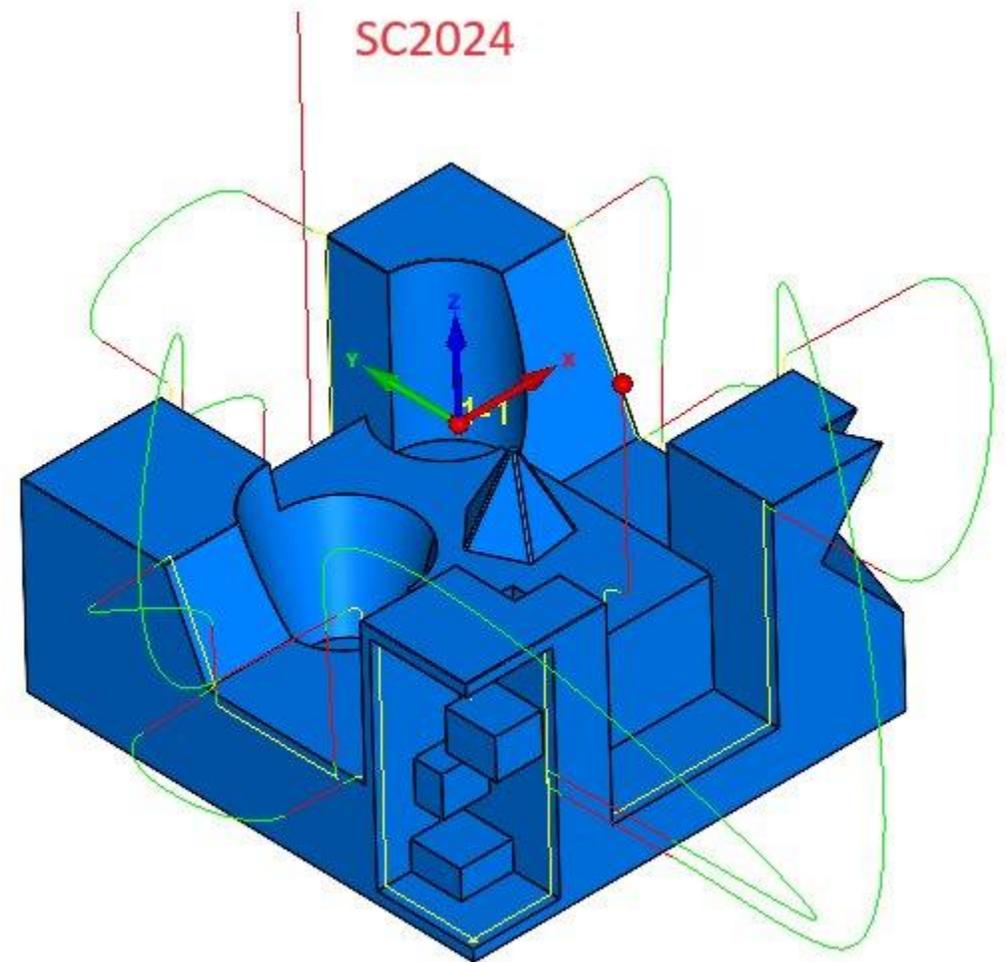
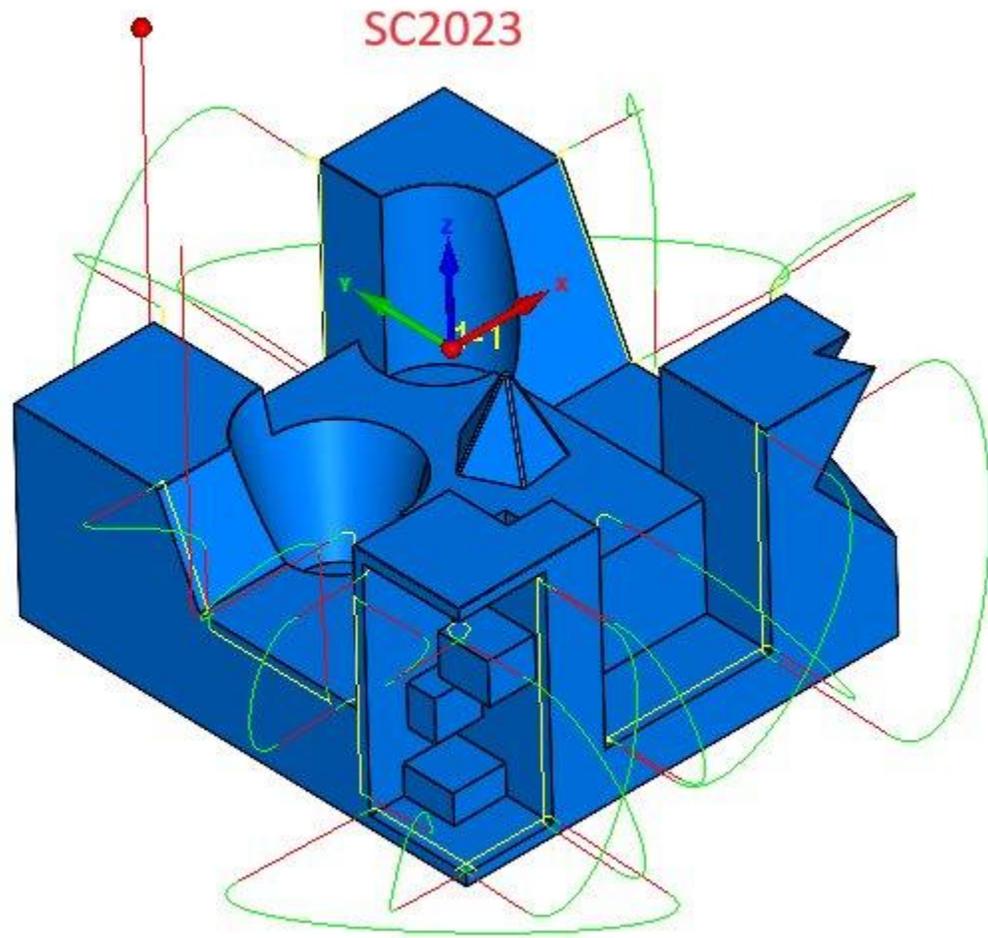
WATCH VIDEO

MultiAxis Machining - Radial Roughing – Link Threshold



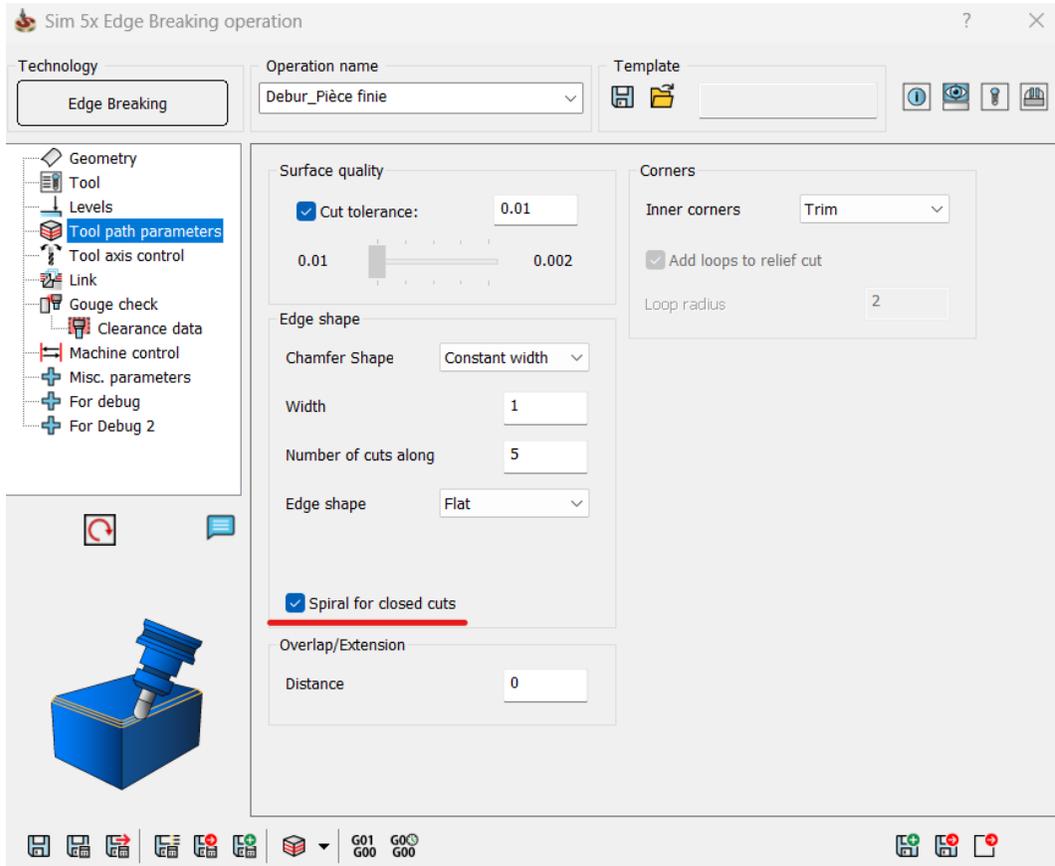
Max Link Length Control: Allows specifying the maximum length for Adaptive roughing links, including Intended and Follow stock links, optimizing links and reducing cycle time.

Edge Breaking – Enhanced toolpath with Taper Mill Tool



Enhanced 5-Axis Edge Breaking: Creates a continuous toolpath around inner and outer corners with a taper mill, eliminating intermediate links for reduced cycle time, available by default in SC2024.

Edge Breaking – Spiral cutting method

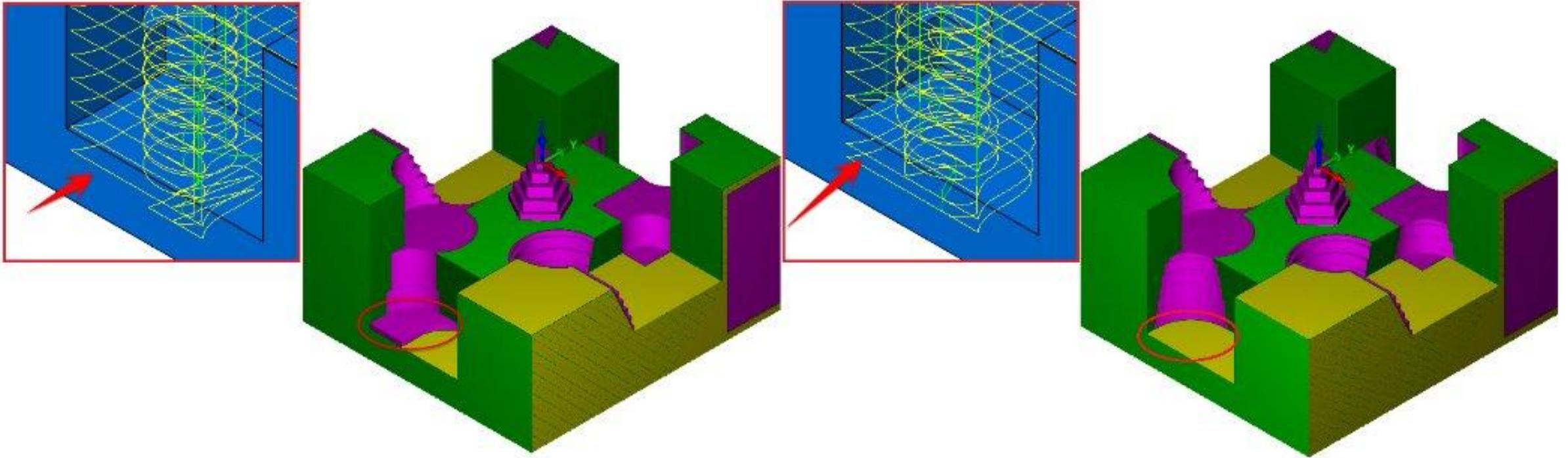


Spiral Cutting Method: Enables multiple cuts using a spiral pattern on closed contours, avoiding stepover marks on chamfered or radius edges, providing a smoother toolpath with fewer machine movements.



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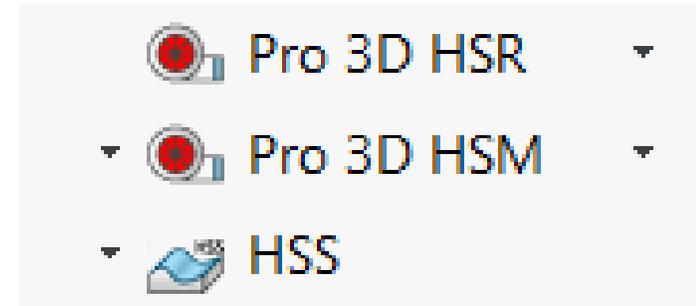
Pro 3D HSR – Modified sorting of Machining of Flat areas



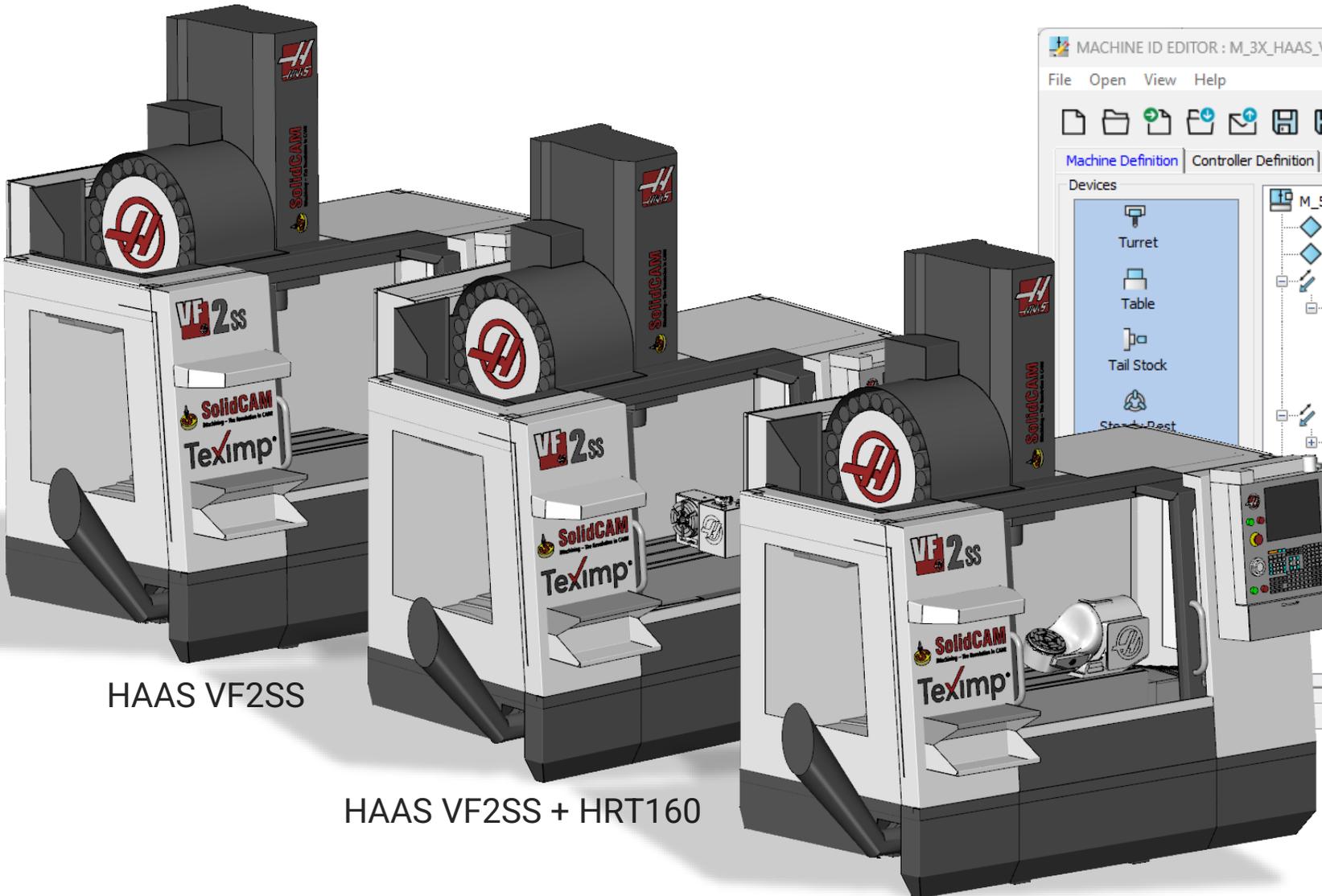
Improved Flat Area Machining: In SC2024, flat areas are machined after each depth of cut, allowing safer access to deeper pockets and addressing stock issues from unsuitable stepdowns. This modification enhances machining efficiency and tool access.

Important Information

- ❑ **Turbo 3D HSR** will be referred (renamed) as **Pro 3D HSR**.
- ❑ **Pro 3D HSR** is applicable only for new operation.
- ❑ **Turbo 3D HSM** Technology is depreciated.
- ❑ Creating new Turbo 3D HSM operations from the CAM tree menu, template, or process template is possible only using a **feature flag**.
- ❑ Existing **Turbo 3D HSM** operations can be calculated without the feature flag.
- ❑ **Pro 3D HSM** is the alternative technology for Turbo 3D HSM.
- ❑ **Turbo 5-Axis Milling** is available in the SolidCAM Beta options.
- ❑ **Improved geometry preparation algorithm** for Mesh based toolpath technologies, there will be some changes in the toolpath from the previous version.



VMID – Support Configurations



HAAS VF2SS

HAAS VF2SS + HRT160

HAAS VF2SS + TRT160

MACHINE ID EDITOR : M_3X_HAAS_VF2.vmc

File Open View Help

M_5X_HAAS_VF2_TRT160 English

Machine Definition Controller Definition User-Defined Parameters Working Style

Devices

- Turret
- Table
- Tail Stock
- Stock Rest

M_5X_HAAS_VF2_TRT160

- Options
- Machine Orientation
 - Y
 - X
 - A
 - C
 - Table
- Z
- Spindle
- VF2
- Tools Magazines
- Magazine
- Fixtures Magazines
- Submachines
- 5-Axis

Name	Value	Units
Name	C	
Axis Type	ROTARY	

VMC Manager

VMID configurations

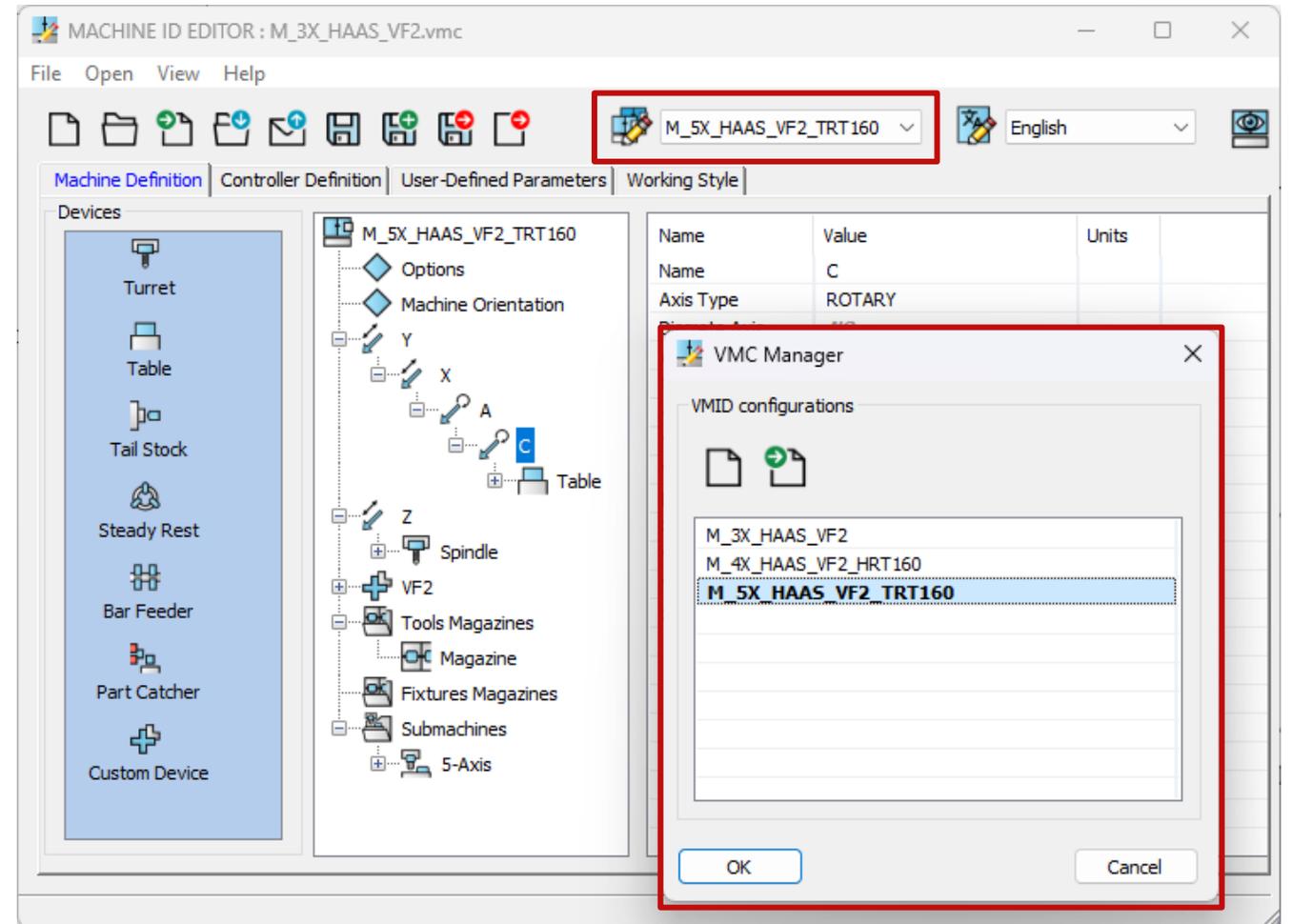
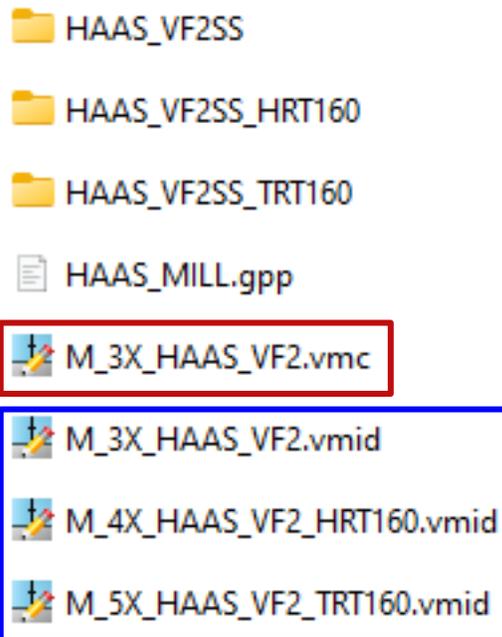
- M_3X_HAAS_VF2
- M_4X_HAAS_VF2_HRT160
- M_5X_HAAS_VF2_TRT160**

OK Cancel

VMID – Support Configurations

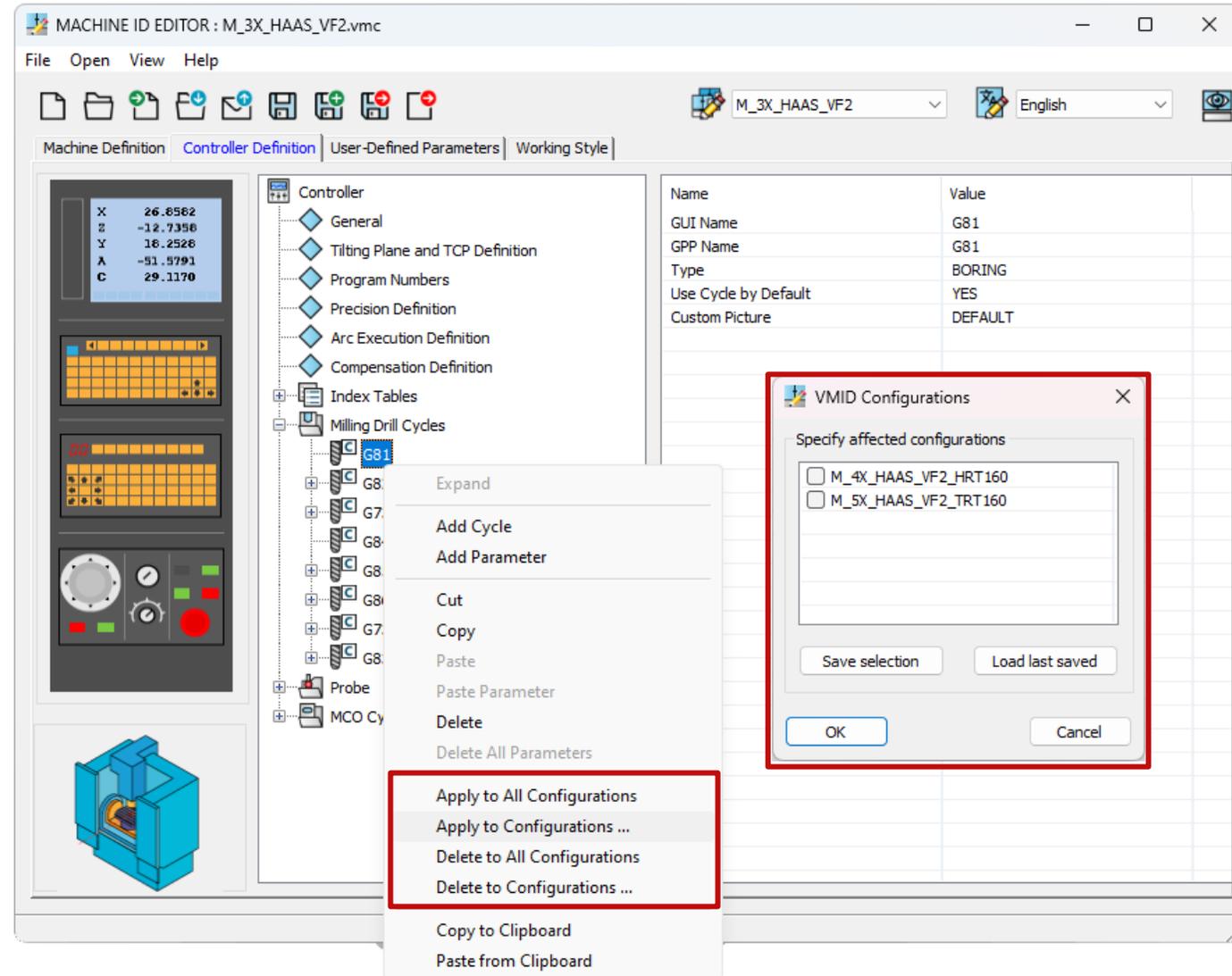
- ❑ Ability to **create, import** and **manage** machine configurations within single interface
- ❑ If configurations are defined, they are placed in the **VMC** file; otherwise, **VMID** remains.

Master



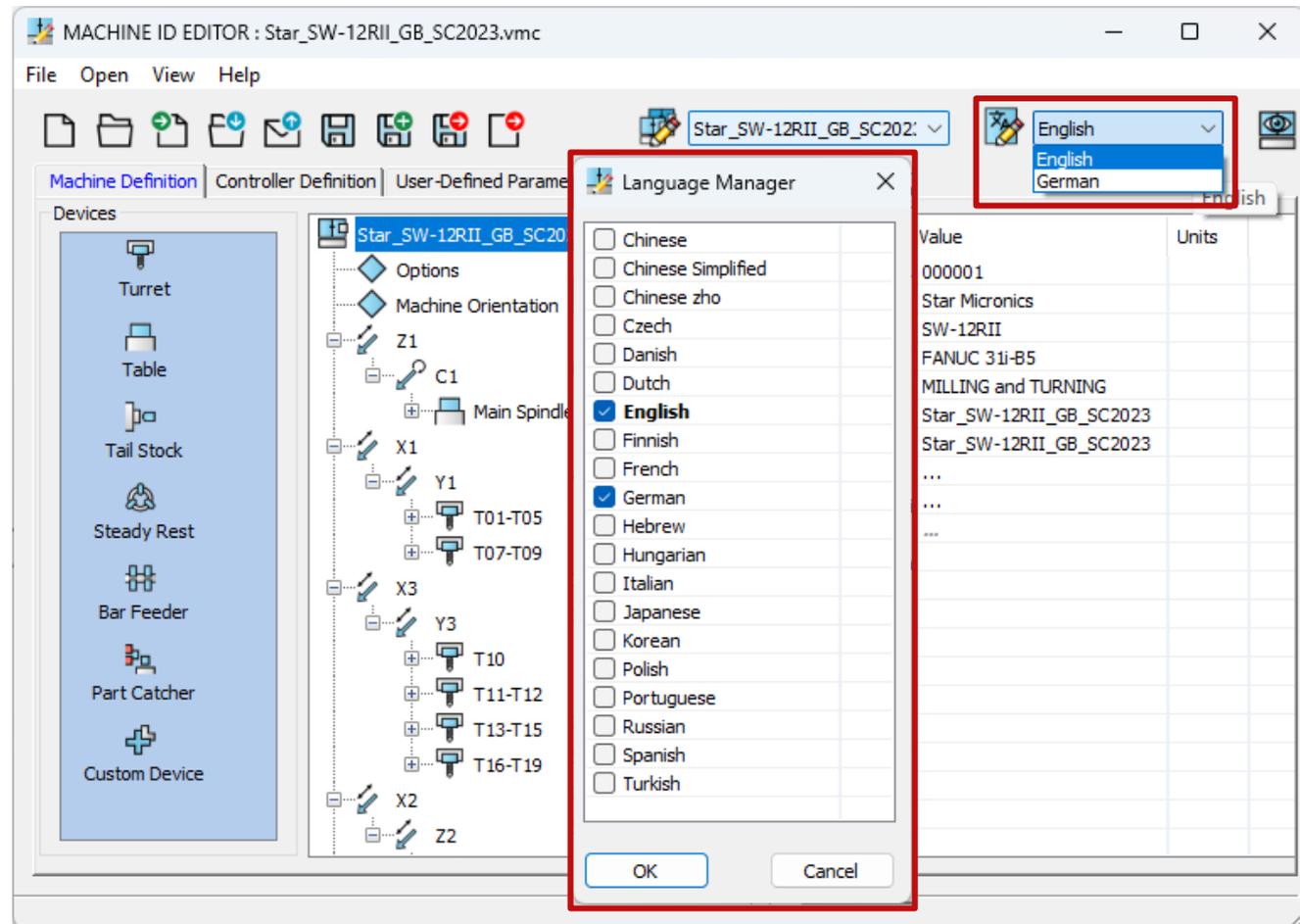
VMID – Support Configurations

- ❑ Any change in configuration may be **applied to other Configuration**
- ❑ **Save selection** and **Load last saved** configuration helps to easily selects last saved configuration.
- ❑ **Changes (adding, modifying or removing)** may be applied on Axes, Devices, Submachines, Index Tables, Parameters, MCO and Drilling Cycles.



VMID – Multi-language support

- ❑ **Maintain** two or more languages within VMC file.
- ❑ **GUI Name** on Device, Magazine, Submachine, Milling and Turning Drilling cycles, MCO's, Machine, Misc., Milling, Turning and Probe Parameters are affected by multi-language option.
- ❑ **Axis Name** is not Language sensitive!



VMID – Multi-Language GUI parameters support

- ❑ Languages are not auto-translated

MACHINE ID EDITOR : Star_SW-12RII_GB_SC2023.vmc

File Open View Help

Star_SW-12RII_GB_SC202: German

Machine Definition | Controller Definition | **User-Defined Parameters** | Working Style

Machine Options

- (#529) Abstechedrehzahl / konstante Schnittgeschwindigkeit
- (#524) Durchstechedurchmesser Abstechen
- (#522) Abstechvorschub**
- (#518) Spanbrechen beim Abstechen
- (#517) Abhebebetrag beim Abstechen
- (#532) max. Spindeldrehzahl
- (#515) X-Position Vorschub / 2
- Ausgabe im Multifile Format
- Einzelne UP Ausgabe fuer Multifiledatei

Milling Misc. Parameters

- Vorschub fuer G0 Bewegung
- M01 Ausgabe vor Job
- Kontur Ausgabe in Unterprogramm
- C-Achsenklemmung

Turning Misc. Parameters

Name	Value
GUI Name	(#522) Abstechvorschub
GPP Name	nVMID_MO_V522
Type	NUMERIC
Default Value	0.040
Description	

MACHINE ID EDITOR : Star_SW-12RII_GB_SC2023.vmc

File Open View Help

Star_SW-12RII_GB_SC202: English

Machine Definition | Controller Definition | **User-Defined Parameters** | Working Style

Machine Options

- (#529) Spindle speed/CSS
- (#524) Cut-off end position
- (#522) Cut-off feed rate**
- (#518) Cutting depth for auto cut-off 0=OFF
- (#517) Retraction distance
- (#532) Max spindle speed
- (#515) X-Position where feed rate is half
- Multi-file output
- Sub programs in Single File

Milling Misc. Parameters

- Overwrite rapid feed G0
- M01 at job
- Output to Sub-program
- Clamping C-axis

Turning Misc. Parameters

- Overwrite rapid feed G0

Name	Value
GUI Name	(#522) Cut-off feed rate
GPP Name	nVMID_MO_V522
Type	NUMERIC
Default Value	0.040
Description	



VMID – Multi-Language GUI parameters support

English

German

Name	Type	Value
(#529) Spindle speed/CSS	Integer	80
(#524) Cut-off end position	Numeric	-0.800
(#522) Cut-off feed rate	Numeric	0.040
(#518) Cutting depth for auto cut-off 0=OFF	Numeric	0.000
(#517) Retraction distance	Numeric	0.250
(#532) Max spindle speed	Integer	3500
(#515) X-Position where feed rate is half	Numeric	1.000

Name	Type	Value
(#529) Abstechedrehzahl / konstante Schnittgeschwindigkeit	Integer	80
(#524) Durchstechdurchmesser Abstechen	Numeric	-0.800
(#522) Abstechvorschub	Numeric	0.040
(#518) Spanbrechen beim Abstechen	Numeric	0.000
(#517) Abhebebetrag beim Abstechen	Numeric	0.250
(#532) max. Spindeldrehzahl	Integer	3500
(#515) X-Position Vorschub / 2	Numeric	1.000

Machine Control Operation

Technology: General | Operation name: MACHINE_CTRL

- === Main spindle ===
- \$1|Z1-Positioning with cut-off tool selection
- \$1|End of program with bar change
- === Back spindle ===
- \$2|Z2-Positioning - G131
- \$2|Z2-New position - G131
- \$2|Z2-Retract after cut-off
- \$2|T2000 selection without part
- \$2|T2000 selection with part
- === Synchronization ===
- \$1|\$3|\$1=S2 spindle synchronization
- \$1|\$3|Z1=Z2 axis synchronization
- \$1|\$3|C1=C2 axis synchronization
- === Part eject ===
- \$2|Part eject
- === Machine functions ===
- \$2|Optional block skip (M75)

Operation name: Z2-Positioning - G131

Process: Start definition

- Submachine
- CoordSys
- Parameters

GUI Name	Value
Comments	Pick-off
Z2-Approach position (WCS)	5
Z2-Clamp position (WCS)	Setup Loc' (1.2)
Feed (mm/min)	1500
Air through spindle (M14)	ON
Coolant through spindle	OFF
Torque Limiter	YES
Collet status in approach position	OPEN
Collet status in clamp position	CLOSE

Machine Control Operation

Technology: General | Operation name: MACHINE_CTRL

- === Hauptspindel ===
- \$1|Z1-Positionieren mit Wkz-Anwahl
- \$1|Programmende mit Stangenwechsel
- === Gegenspindel ===
- \$2|Z2-Positionieren - G131
- \$2|Z2-Neu Positionieren - G131
- \$2|Z2-Wegfahren nach Abstechen
- \$2|T2000 Anwahl ohne Teil
- \$2|T2000 Anwahl mit Teil
- === Synchronisierung ===
- \$1|\$3|\$1=Z2 Spindelsynchronisation
- \$1|\$3|Z-Achsen Synchronisation
- \$1|\$3|C-Achsen Synchronisation
- === Werkstueck Auswerfen ===
- \$2|Part eject
- === Maschinenfunktionen ===
- \$2|Optionaler Satzprung (M75)

Operation name: Z2-Positioning - G131

Process: Start definition

- Submachine
- CoordSys
- Parameters

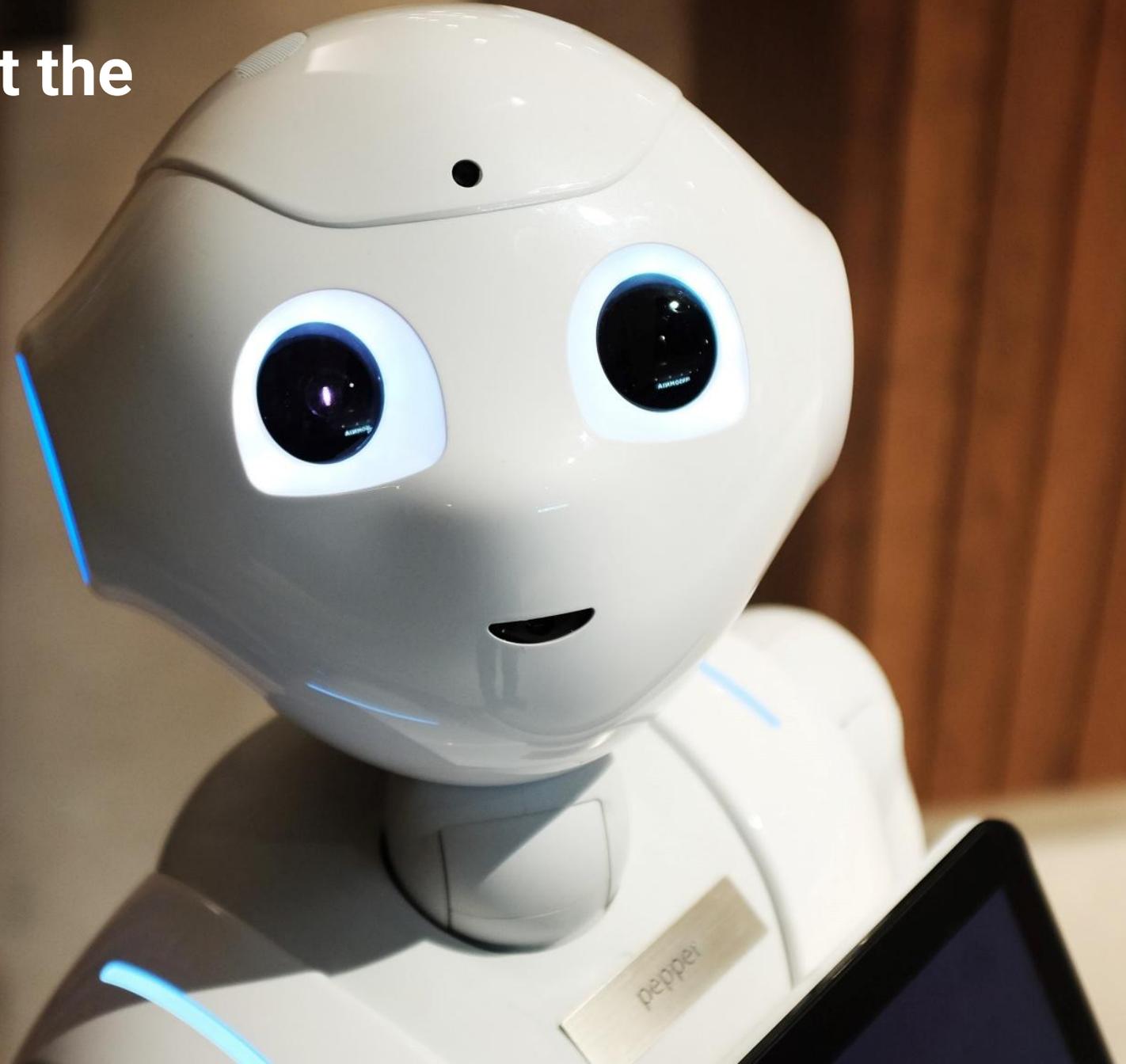
GUI Name	Value
Kommentar	Abgreifen
Z2-Anfahrposition (WKS)	5
Z2-Endposition (WKS)	Setup Loc' (1.2)
Vorschub mm/min	1500
Luft durch Spindel	ON
Kühlwasser durch Spindel	OFF
Drehmomentbegrenzung	YES
Spannzange bei Anfahrposition	OPEN
Spannzange bei Endposition	CLOSE

"The best way to predict the future is to create it."

– Peter Drucker

SolidCAM

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THANKS FOR WATCHING

