GIBBSCAM 2024 CAM for Production Machining

Version 2024 : October 2023

What's New in GibbsCAM 2024

CAMBRIO

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Highlights

Some of the most important enhancements in GibbsCAM 2024 are as follows:

- Integration of Reprise License Manager, replacing CimLM. For details, see "Licensing using Reprise License Manager" on page Licensing using Reprise License Manager.
- Precise variable-depth engraving of outline fonts with taper-tipped tools. For details, see "Variable-depth engraving of outline fonts" on page Variable-depth engraving of outline fonts.
- Color map to visualize radius of curvature and surface angles. For details, see "Color map to visualize curvature and taper angles" on page Color map to visualize curvature and taper angles.
- Part setup improvements that provide additional offsetting options and part orientation control, and a revamped/improved approach to Intermediate Tooling fixtures. For details, see "New part setup capabilities" and "Improved Intermediate Tooling fixtures" on page New part setup capabilities.
- Integration of Sandvik CoroPlus Tool Library (CPTL) into GibbsCAM. For details, see "Integration of Sandvik CoroPlus Tool Library (CPTL)" on page Integration of Sandvik CoroPlus Tool Library (CPTL).

This "Highlights" section is just a small subset of the enhancements in GibbsCAM 2024. The next section ("Overview of What's New") provides a complete list.

Overview of What's New

Significant enhancements to **Milling** include:

- Mill Cutoff for MTM
- Contouring: Improvements to Ramp Down
- Precise variable-depth engraving of outline fonts with taper-tipped tools

For details, see ""Milling"" on page Milling.

Enhancements to **Probing** include:

- New cycle in Generic Probing for probing of rotary part alignment and positioning

For details, see ""Probing"" on page Probing.

Enhancements to **Visualization and User Interface**:

- Color map to visualize radius of curvature and surface angles
- Interrogation via Alt+click “virtual” points: line midpoints, arc/circle centerpoints, etc
- Feeds and speeds can now be attached to tools and processes.

For details, see ““Visualization and User Interface”” on page Visualization and User Interface.

Improvements to **Tooling**:

- Mill Form Tool Programming Parameters: User-specified parameters for simplified toolpath generation with mill form tools while retaining the form’s profile for rendering
- Feeds and speeds can now be attached to tools and processes.
- Integration of Sandvik CoroPlus Tool Library (CPTL) into GibbsCAM.
- Second-generation B-type inserts for better PrimeTurning performance.

For details, see ““Tooling”” on page Tooling.

Improvements to **Posting and Output**:

- Posts can now use the Post dialog to provide some selections and input parameters.
- New dialog “Restrict Workfixtures” lets you restrict the system’s use of WFOs

For details, see ““Posting and Output”” on page Posting and Output.

Miscellanous improvements and changes:

- Integration of Reprise License Manager, replacing CimLM.
- Architectural and infrastructure improvements that revamp Intermediate Tooling fixtures and provide additional offsetting options and part orientation control for part setup.
- Saved process lists will restore CS's if equivalent ones are available in the target part.

- Allow user control of machine orientations when cutting at singularities (i.e., tool aligned with rotary axis), in Polar, 3-axis Positioning, and 5-axis.

For details, see ““Miscellaneous”” on page Miscellaneous.

Improvements to **5-Axis**:

- Integration of ModuleWorks 2023.04 and 2022.12.

For details, see ""5-Axis"" on page 5-Axis.

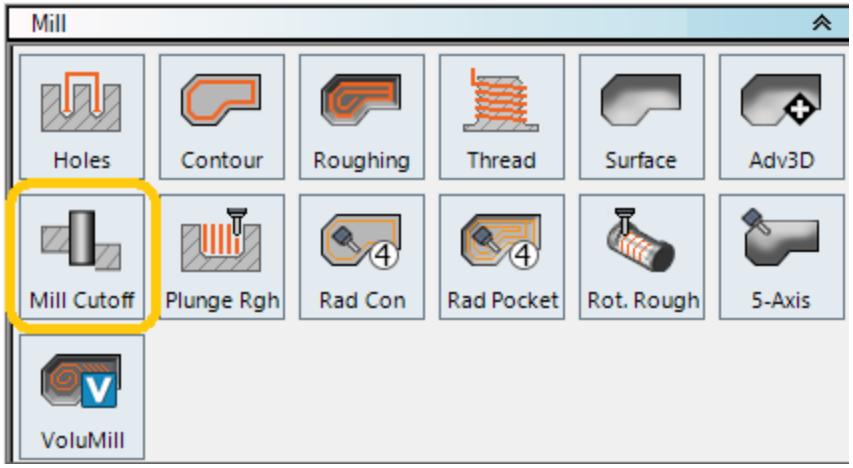
Milling

GibbsCAM 2024 includes several important Milling enhancements.

Mill Cutoff for MTM

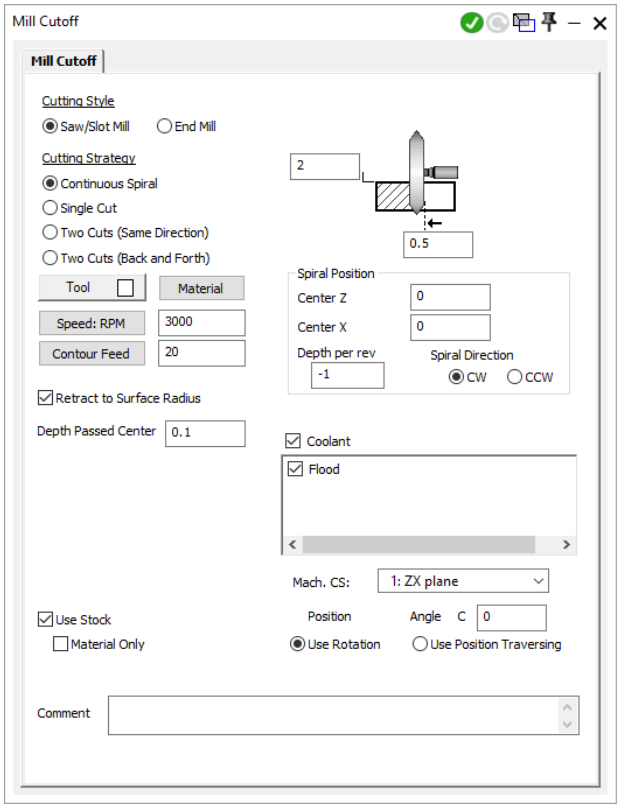
GibbsCAM 2024 adds a new Mill process: **Mill Cutoff**.

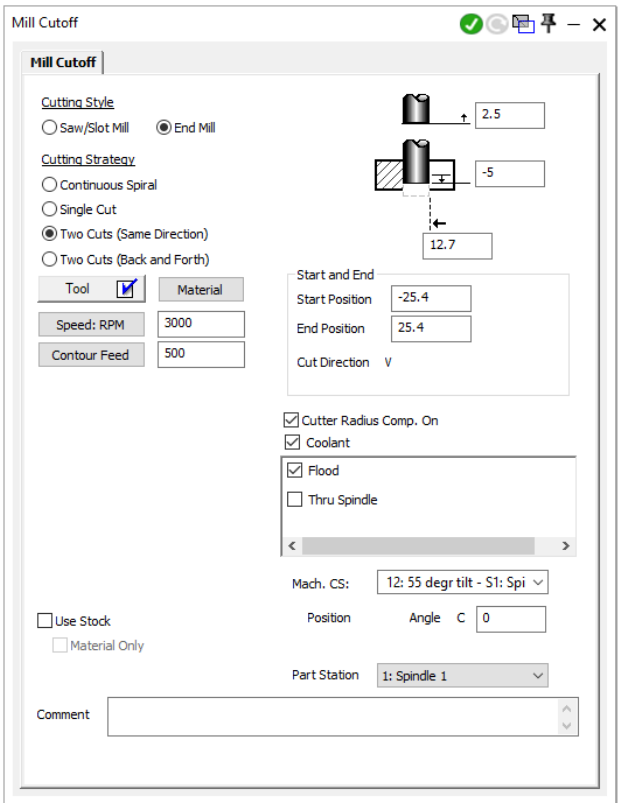
Where to find it: The flyout for Mill processes (e.g., after dragging a Mill tool to a blank process tile) now looks like this.



*What it does:***Mill Cutoff** provides a way to cut a part off of bar stock with a milling tool. It can use either an end mill style tool held with the spindle perpendicular to the work, or a large side mill or slitting saw held with the spindle parallel to the work. Various motion options are provided, depending on the machine's capabilities.

Here are two varieties of the **Mill Cutoff** process dialog.





Contouring improvements to Ramp Down

Where to find it: Mill > **Contour** (Offset Contour) > Ramp Down checkbox.

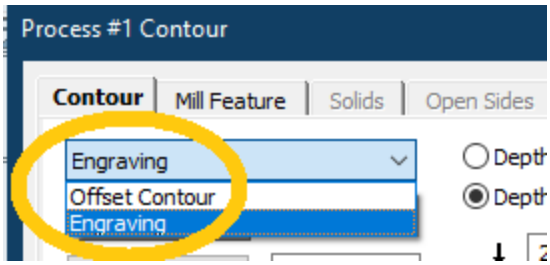
Without any changes to the user interface, the output of Ramp Down toolpath has been significantly improved, creating smooth continuous contours wherever possible instead of many different entries and exits.

Pocket Contour Support for Material Only

Without any changes to the user interface, the output of the Mill **Contour** process with Material Only enabled has been improved to generate precise, accurate, and reliable toolpath.

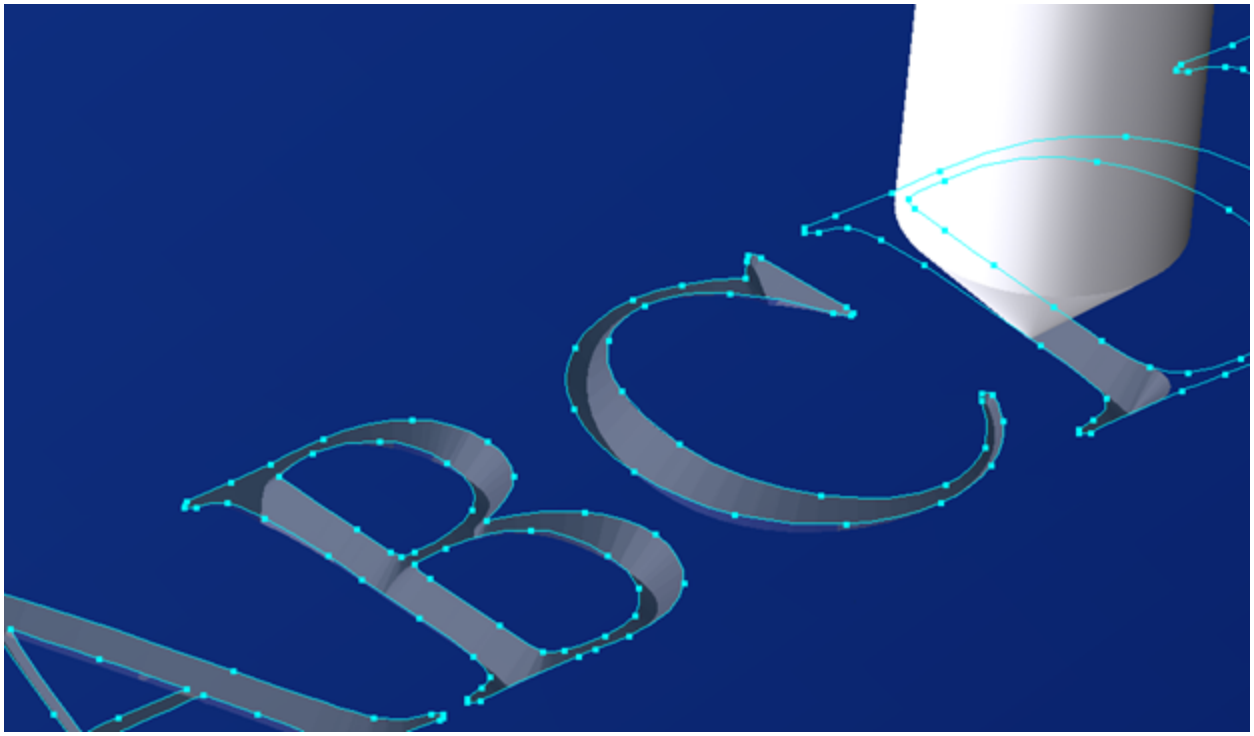
This applies when the **Contour** process follows a **Pocket** process within the same process list when both processes use Material Only.

Variable-depth engraving of outline fonts



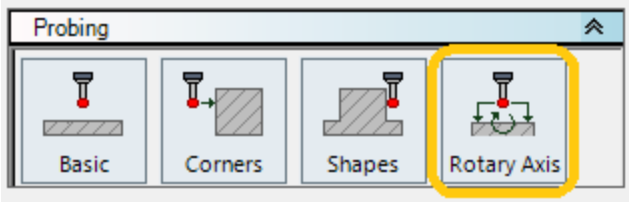
Where to find it: In Mill > **Contour**: the upper left pulldown menu offers new option Engraving.

Using this function on an outline font enormously improves the quality, crispness, and control of engraving compared to conventional offset contouring or pocketing.



Probing

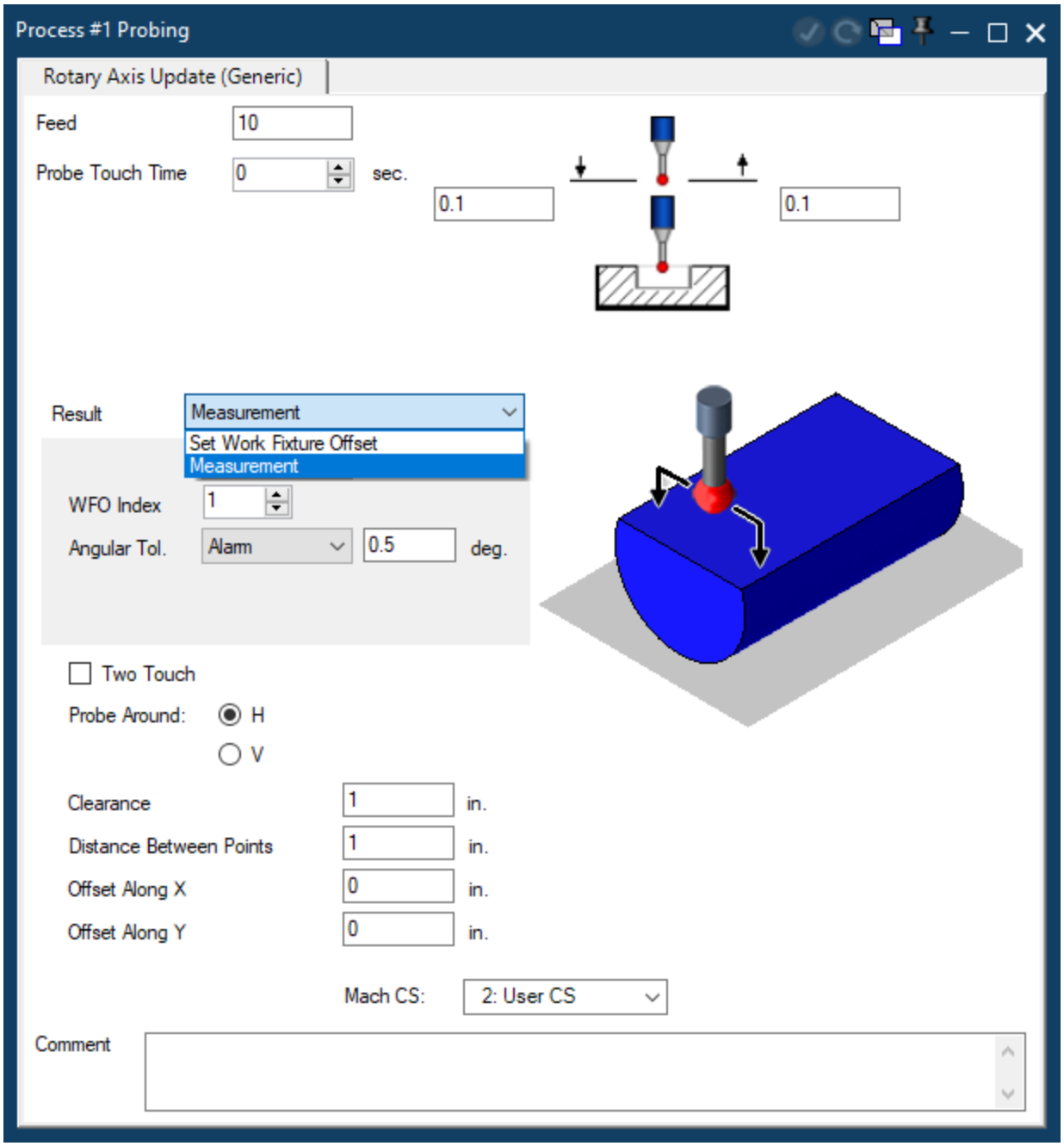
GibbsCAM Probing is enhanced in Version 2024.



Where to find it: The flyout for Probing processes (e.g., after dragging a Probing tool to a blank process tile) now looks like this. If necessary, use **Plug-Ins** > Plug-In Manager and tick the checkbox for GibbsCAM Generic Probing Support.

Generic Probing process: Rotary Axis Update

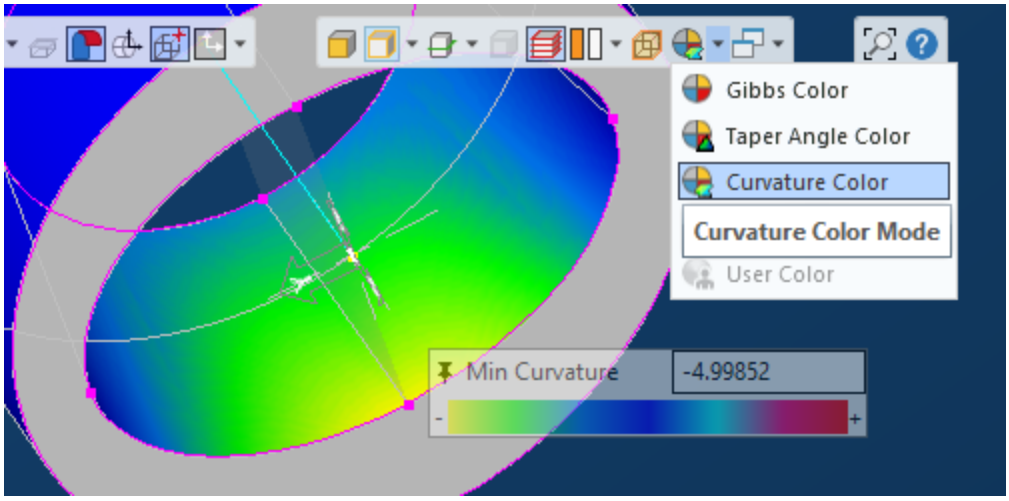
The new **Rotary Axis** process dialog extends GibbsCAM Probing capabilities to rotary parts, as illustrated below. The **Result** pulldown list offers two choices: Set Work Fixture Offset and Measurement.



Post Support: Although new post orders for GibbsCAM 2024 Probing will support Rotary Axis probing, posts from GibbsCAM 2023 and earlier that support Probing will need modifications to add support for this probing cycle.

Visualization and User Interface

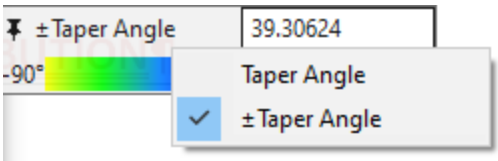
Color map to visualize curvature and taper angles



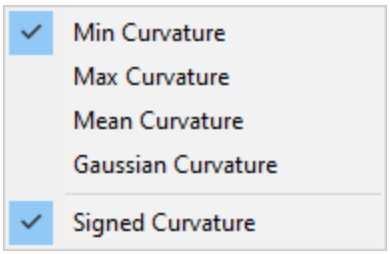
Where to find it: On the floating Task Bar, the Color Mode dropdown now has two new menu items: Taper Angle Color and Curvature Color.

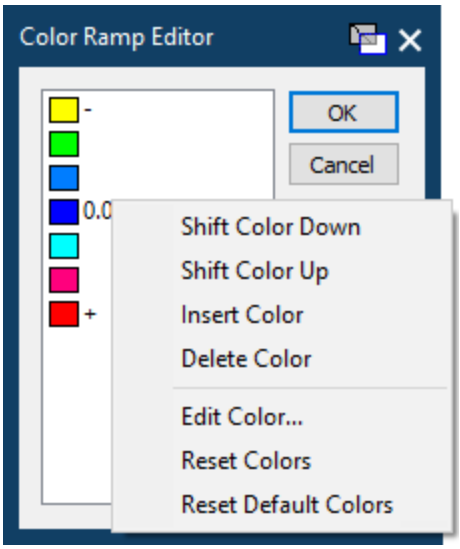
Activating either mode causes solid and surfaces to be displayed using a color palette whose legend is shown in an accompanying dialog box that floats under the current cursor position unless pinned.

Additional control is provided by context menus:

- 

Right-clicking the title bar of the **Taper Angle** dialog opens a context menu that lets you toggle between a color spectrum of 0 to 90 degrees and a spectrum of —90 to +90 degrees.

- 



Right-clicking the title bar of the **Curvature** dialog opens a context menu that lets you choose exactly how curvature values are calculated and whether or not to display negative curvature values.

- Right-clicking the color spectrum below the title bar lets you open the **Color Ramp Editor**, which gives you control over how colors represent values of taper angle or curvature.

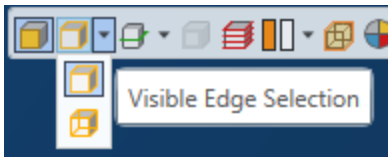
Displaying and using virtual points via ALT and ALT+Click

Where to find it: Pressing the `ALT` key while hovering your cursor over geometry (lines, segments, arcs, circles, surfaces, and solids) now displays virtual points such as: midpoints of lines; center points of arcs and circles; vertices between solid model edges and midpoints of linear solid model edges (when Edge Selection is enabled), the corner points and edge points of cubic stock (when visible); and others.

- You can `ALT+Click` to interrogate a coordinate and place it a dialog's text field (or `ALT+SHIFT+Click` to interrogate coordinates and place them into multiple text fields), without any need to use copy-and-paste. For example, it now takes just two actions to move or rotate the model when you use a virtual point in the **Translate** or **Rotate** dialog.

- When the **Dimension** palette is open, you can use virtual points to preview and create dimensions.

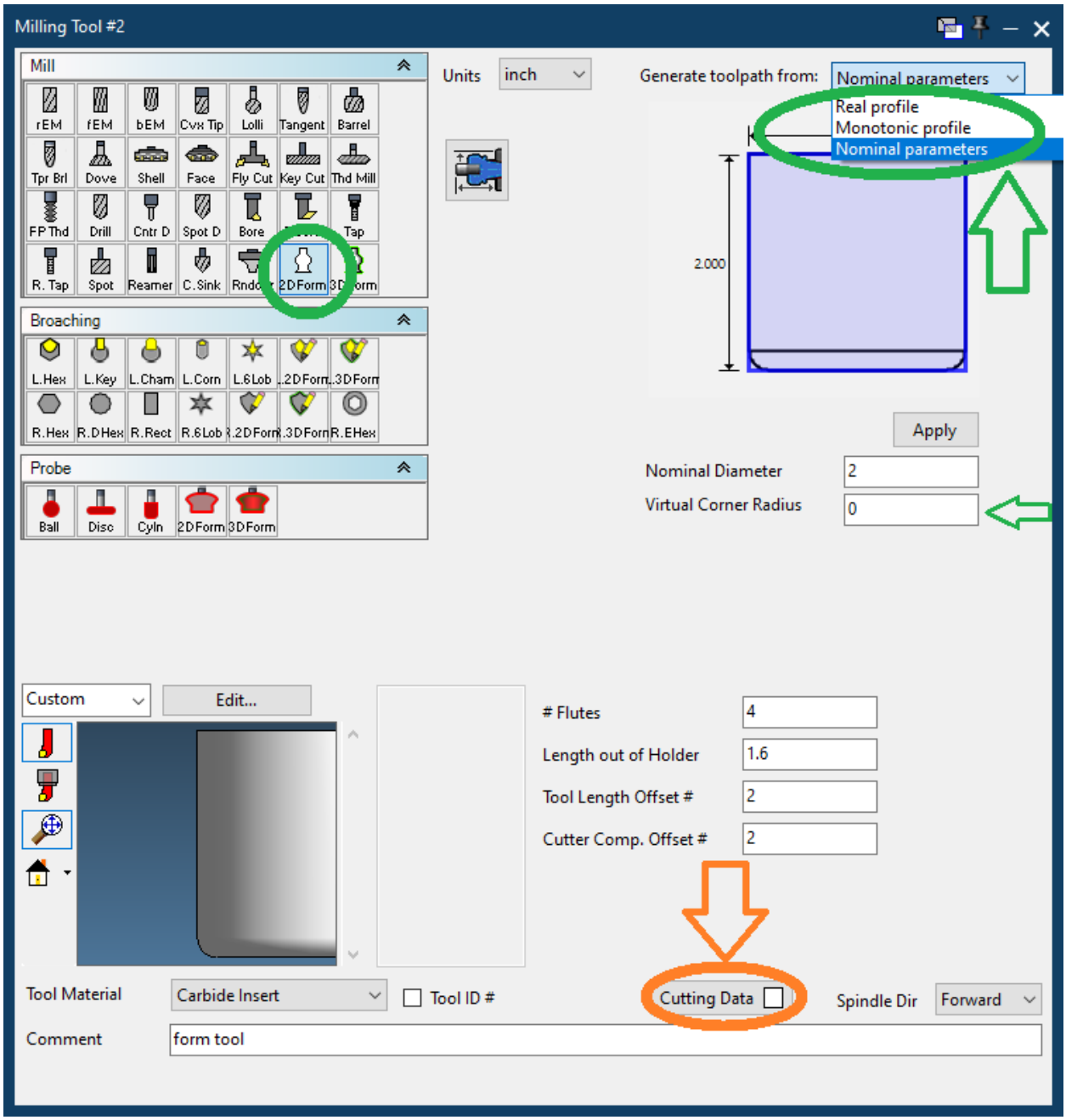
Visible Edge Selection



A new **Edge selection** mode is now available. When Visible Edge Selection is active, edges that are behind the solid body are hidden, making it easier to select the correct edges on a complex solid model.

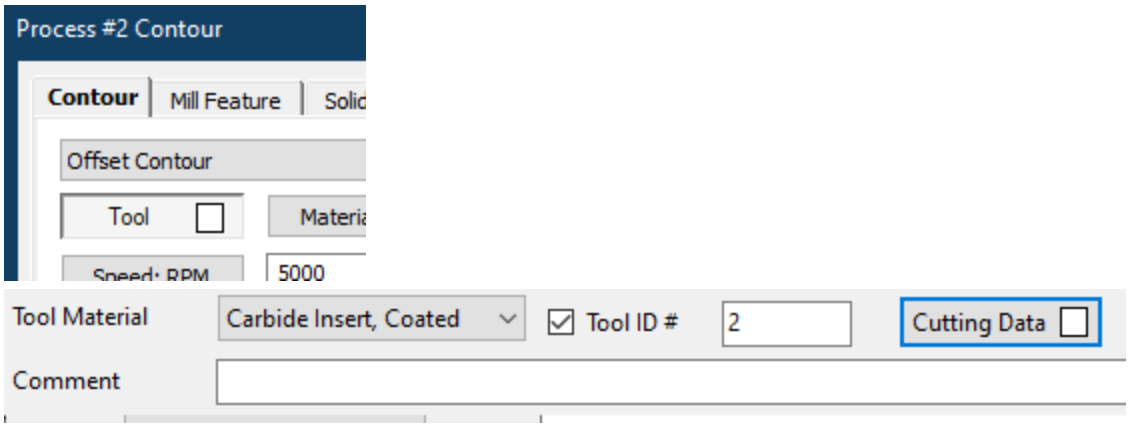
Tooling

Improvements to tools and tooling have occurred throughout GibbsCAM 2024.



Feeds and speeds optionally attached to tools and processes

Where to find it: If a tool has a feeds/speeds data attached to it (this typically occurs only in tools that have been imported), its **Tool** dialog has a checkmark in the Cutting Data ☑ button. Processes that use this tool display a checkmark in their Tool ☑ button; see illustrations below. Clicking either button opens a dialog that lets you view or change the data attached to the tool.



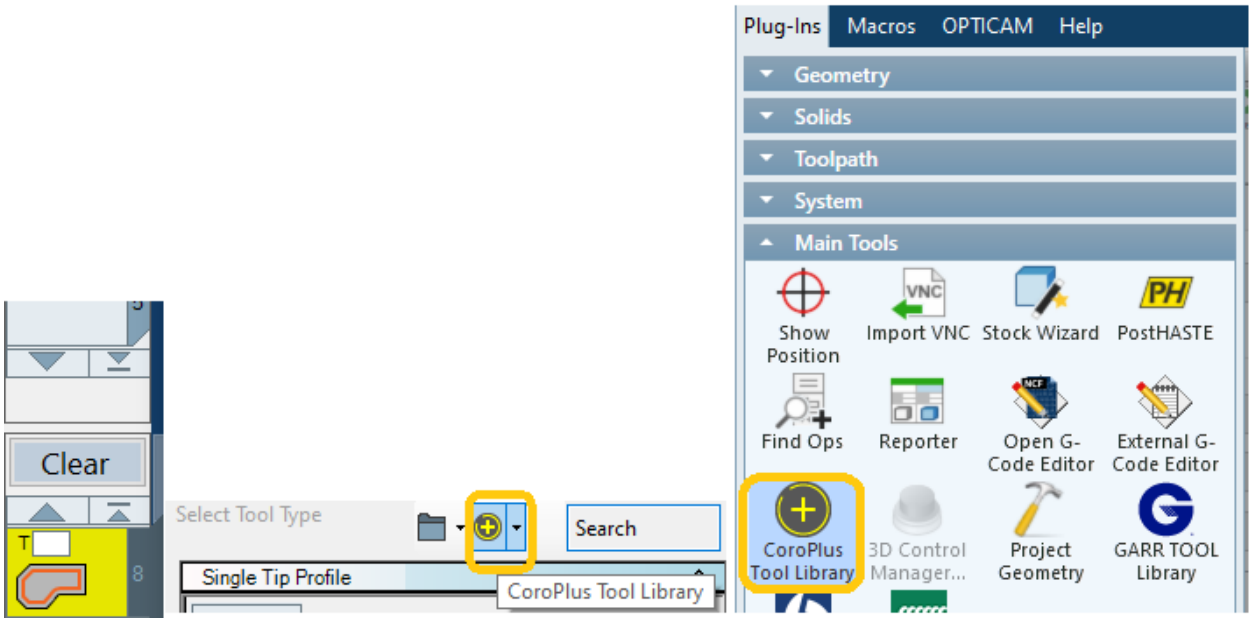
Integration of Sandvik CoroPlus Tool Library (CPTL)

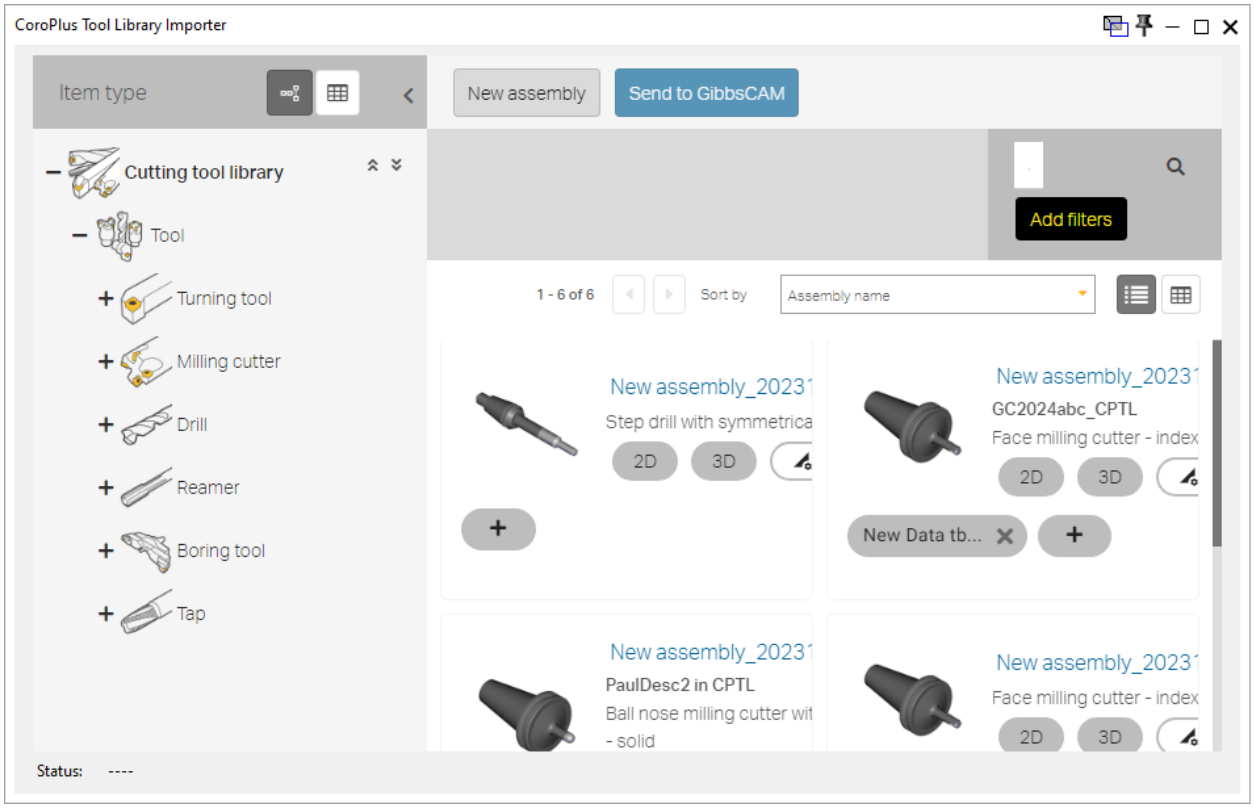
Where to find it: On the **Plug-Ins** menu, under Main Tools, click CoroPlus Tool Library

Or, from the process flyout (double-click a process tile) select the CoroPlus Tool Importer.

Please Note: You must have a valid and active CPTL account and tool data (tools, holders, cutting data, etc.) to use the GibbsCAM **CoroPlus Tool Library Importer**.

For full information on installing and using this tool library and the new GibbsCAM dialogs for **CoroPlus Tool Library Importer**, see the new book *CoroPlus Tool Library (CPTL) Plug-In*.


Plug-Ins
Macros
OPTICAM
Help
Geometry
Solids
Toolpath
System
Main Tools
Show Position
Import VNC
Stock Wizard
PostHASTE
Find Ops
Reporter
Open G-Code Editor
External G-Code Editor
CoroPlus Tool Library
3D Control Manager...
Project Geometry
GARR TOOL Library
Clear
Select Tool Type
Search
Single Tip Profile
CoroPlus Tool Library


CoroPlus Tool Library Importer
Item type
New assembly
Send to GibbsCAM
Cutting tool library
Tool
Turning tool
Milling cutter
Drill
Reamer
Boring tool
Tap
Add filters
1 - 6 of 6
Sort by
Assembly name
New assembly_2023
Step drill with symmetrica
2D
3D
New assembly_2023
GC2024abc_CPTL
Face milling cutter - index
New Data tb...
New assembly_2023
PaulDesc2 in CPTL
Ball nose milling cutter wit
- solid
New assembly_2023
Face milling cutter - index
Status: ----

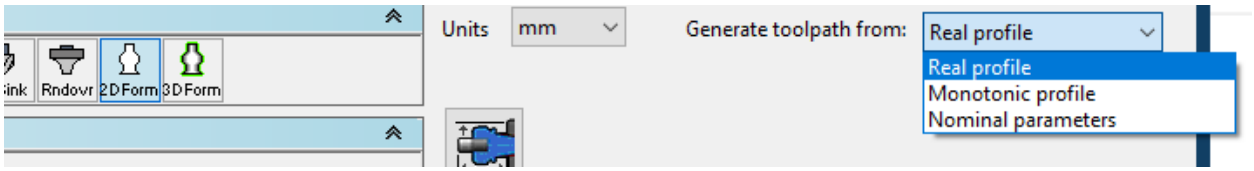
Mill Form Tools: User-specified programming parameters

Where to find it: In the **Tools** dialog, when a Mill tool of type 2D Form or 3D Form is selected, new pulldown menu Generate toolpath from lets you choose how to generate toolpath using this tool:

- **Real profile.** Most accurate but most computation-intensive and therefore slowest. This default behavior matches the behavior of previous releases.
- **Monotonic profile.** This choice disables undercutting when the tool narrows, preserving shank clearance. The contact radius will be the widest part of the tool below the geometry depth.
- **Nominal parameters.** This choice uses the nominal diameter and a new Virtual Corner Radius field to simulate a bullnose mill. The toolpath will regard the tool as a bullnose mill instead of a form tool, but the tool will still be rendered with its actual profile.

  This allows accurate rendering of high-feed mills for which the manufacturer provides programming instructions with a simplified "programming radius" or similar.

Because these choices affect only the calculation of contact points for toolpath generation, Material Only and Rendering functions will use the real profile whenever possible.



Second-generation B-type inserts for PrimeTurning performance

Support has been added for Sandvik Coromant's recently launched second-generation CoroTurn Prime Type B tool assortment with a slightly larger 12mm IC, including new insert parameters and appropriate library toolholders.

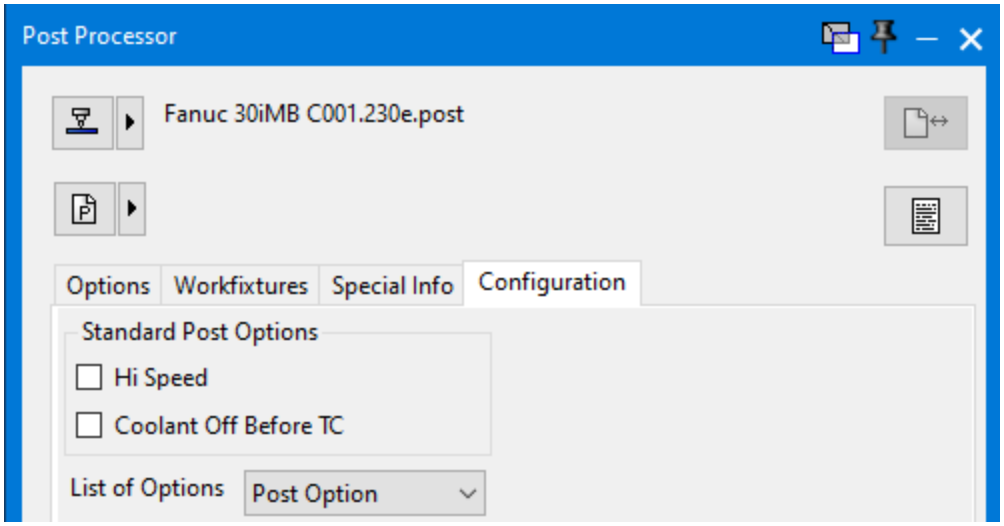
Where to find it: In the **Tool** dialog, create a new CoroTurn Prime B tool.

In the **Inscribed Dia.** pull-down menu, choose 12.00.

Posting and Output

User-entered input parameters in response to posts

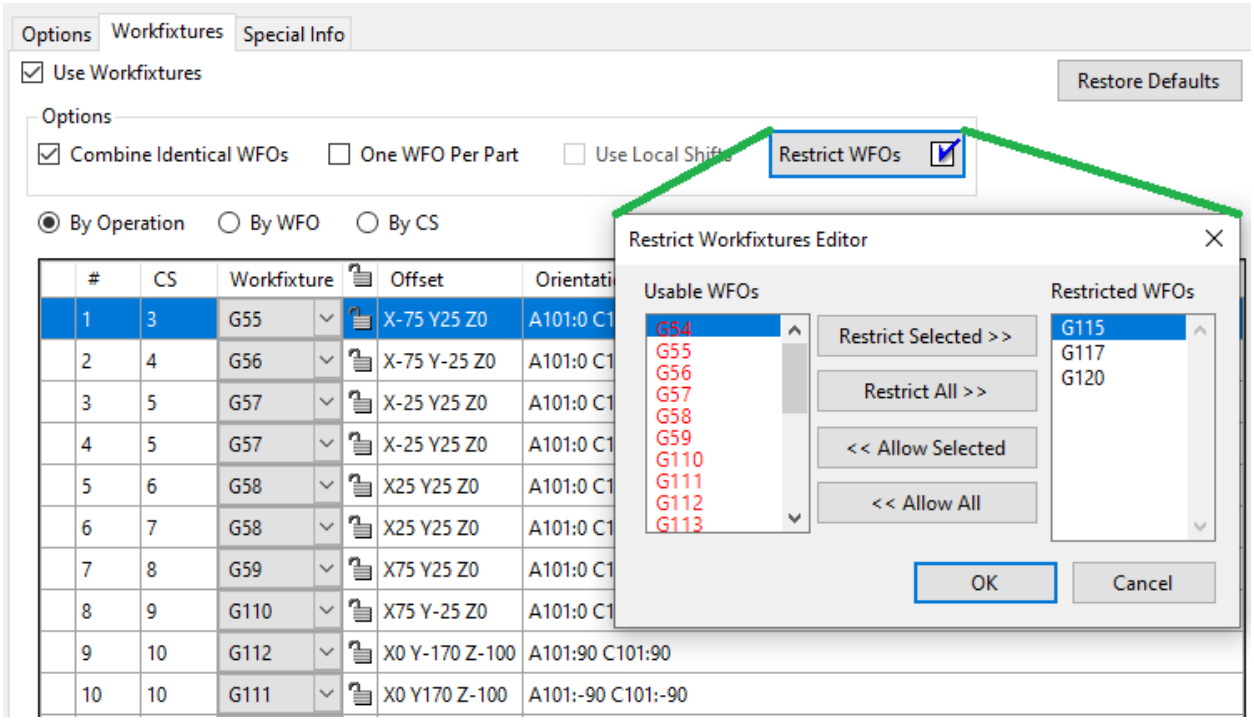
GibbsCAM 2024 now allows posts to present standard and custom options for the end user to select, based on specific options the post developer has developed. The Post dialog's new Configuration tab allows end users to make selections and/or to supply values that will be used by the post.



Post Support: Posts will need to be updated to GibbsCAM 2024 in order to support this new feature. Talk to your post developer to see if there are existing options that can be exposed to make interacting with the Post Processor easier.

WFO GUI: New dialog "Restrict Workfixtures"

Where to find it: In the **Post** dialog, Workfixtures tab, **Options** area has a new button, Restrict WFOs, that opens the new **Restrict Workfixtures Editor**, illustrated below. If the button has a checkbox (as shown), then at least one of the possible workfixture offsets (WFOs) has been made unavailable.


Options
Workfixtures
Special Info
Use Workfixtures
Restore Defaults
Options
Combine Identical WFOs
One WFO Per Part
Use Local Shifts
Restrict WFOs
By Operation
By WFO
By CS
CS Workfixture Offset Orientati
1 3 G55 X-75 Y25 Z0 A101:0 C1
2 4 G56 X-75 Y-25 Z0 A101:0 C1
3 5 G57 X-25 Y25 Z0 A101:0 C1
4 5 G57 X-25 Y25 Z0 A101:0 C1
5 6 G58 X25 Y25 Z0 A101:0 C1
6 7 G58 X25 Y25 Z0 A101:0 C1
7 8 G59 X75 Y25 Z0 A101:0 C1
8 9 G110 X75 Y-25 Z0 A101:0 C1
9 10 G112 X0 Y-170 Z-100 A101:90 C101:90
10 10 G111 X0 Y170 Z-100 A101:-90 C101:-90
Restrict Workfixtures Editor
Usable WFOs
G54
G55
G56
G57
G58
G59
G110
G111
G112
G113
Restrict Selected >>
Restrict All >>
<< Allow Selected
<< Allow All
Restricted WFOs
G115
G117
G120
OK
Cancel

Miscellaneous

Licensing using Reprise License Manager

At Version 2024, GibbsCAM has a new licensing system, replacing CimLM. Reprise License Manager (https://www.reprisesoftware.com/) is a longstanding industry license management tool that is already familiar to many long-time GibbsCAM Resellers and system administrators.

Improved Intermediate Tooling fixtures

In Intermediate Tooling, Fixtures have been completely revamped. A "receptor/attachment" system similar to that used for Toolblocks now allows comprehensive filtering and stacking of fixtures for both part stations and utility nodes, and the user experience for Fixtures now closely resembles Toolblocks.

Fixtures can now reorient and reposition the part or other fixtures, and the change of orientation and position is represented in the workspace view as well as in simulation. Adjustable and programmable fixturing is supported with manually parked or programmable axes in the fixture definition. Extra fixtures that are not going to hold programmed parts can be installed on the machine for simulation and collision-checking purposes.

New part setup capabilities

New options for setting the part orientation and position relative to the part station origin have been added. By default, most mills have full orientation freedom, and most lathes can change the zero position of the part in the C-axis. Handling of chuck width for non-MTM lathes has also been improved.

Saved process lists restore CS's to equivalents in target part

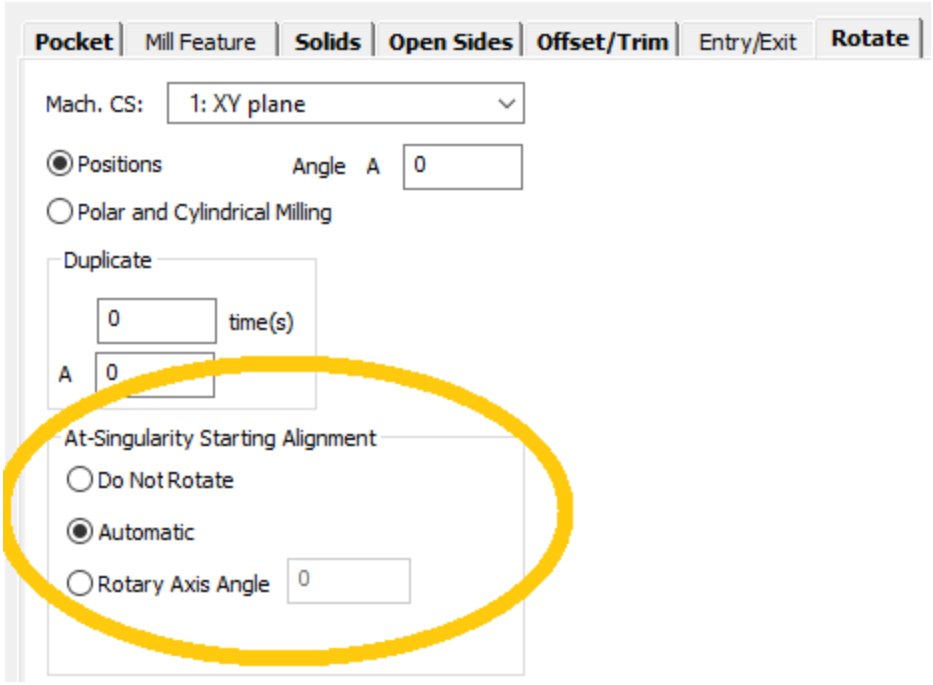
In GibbsCAM 2024, unlike previous releases, when saved process list is opened in a part that contains system CS's, then system CS's in the saved process list are mapped to their

equivalents in the part, so long as the MDD is the same.

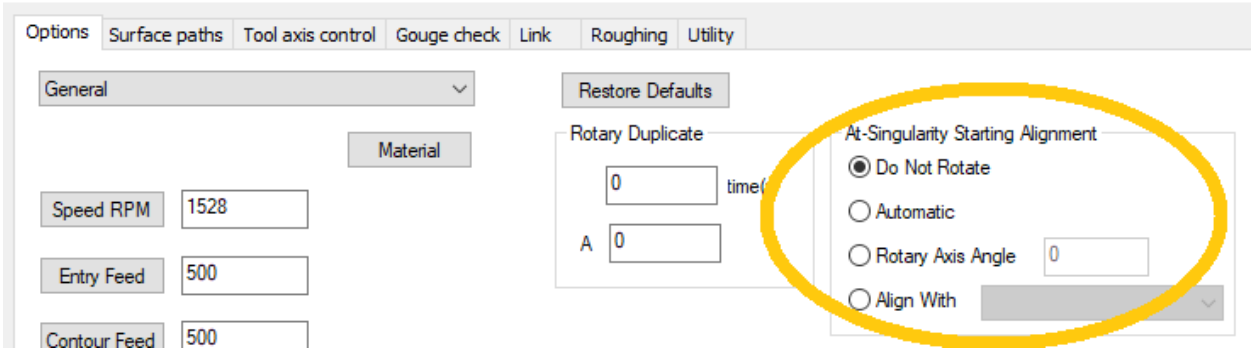
User control of machine orientations when cutting at singularities

Where to find it: In the 5-Axis **Options** tab, and in Mill process dialogs in the **Rotate** tab, the new "At-Singularity Starting Alignment" area offers an array of option buttons. Depending on various factors, such as 3-axis polar (with Polar & Cylindrical selected) vs 3-axis positioned (with Positions selected), and whether the MDD defines alignment vectors,three or more of the following options are displayed:

- Do not rotate This is legacy behavior for 5-axis operations, unavailable for 3-axis polar operations, and a new option for 3-axis positioned operations.
- Automatic This is legacy behavior for both polar and positioned 3-axis operations. and new for 5-axis. It enables the CS hinting mechanism for *starting* singularities (start of op/start of repeat).
- Rotary axis angle This new option lets you enter a raw angle at which GibbsCAM will park the fourth axis before starting the op. Thereafter, the axis will not rotate as long as it remains singular. Note that this option is unavailable if Polar & Cylindrical is selected, because the starting angle is determined by the starting position.
- Align with This option, if available, lets you select from the MDD-defined alignment vector. For polar ops, this vector will be translated from straight toolgroup space onto the rotated part origin, and the tool will be constrained along the vector (polarity matters, but "Allow Cross Center" will still apply). For position milling and 5-axis ops, the Machining CS H vector will be aligned with (the projection of) this vector at the start of the op/repeat. At run time, if the user chooses a vector parallel to the fourth rotary axis, the system will display an error message.



Process #1 5-Axis Parameters



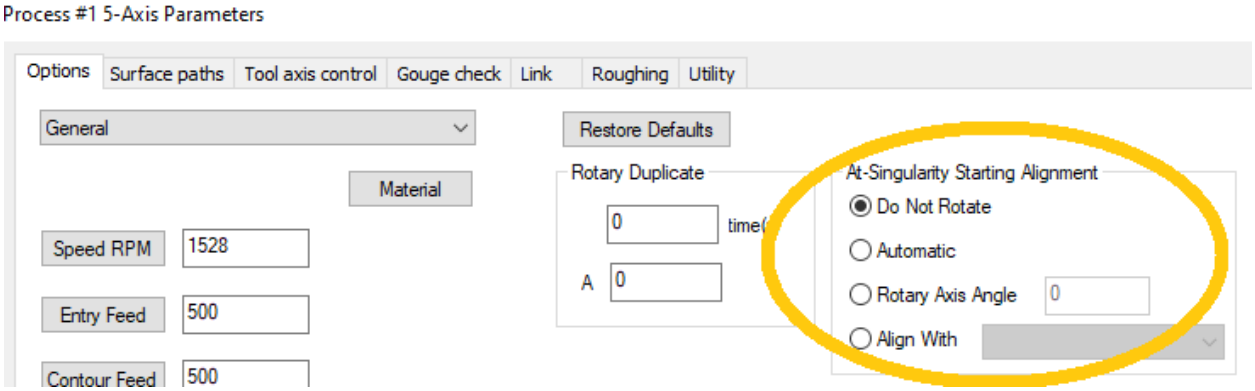
5-Axis

This chapter discusses the following enhancements to 5-Axis in GibbsCAM 2024.

- "Options tab: At-Singularity Starting Alignment"
- "Toolpath calculation based on Surfaces"
- "Toolpath calculation based on Triangle Mesh"
- "Toolpath calculation based on Wireframe"
- "Toolpath calculation based on Multiaxis Machining"
- "Toolpath calculation based on Rotary Machining"
- "Toolpath calculation based on Swarf Machining"

Options tab: At-Singularity Starting Alignment

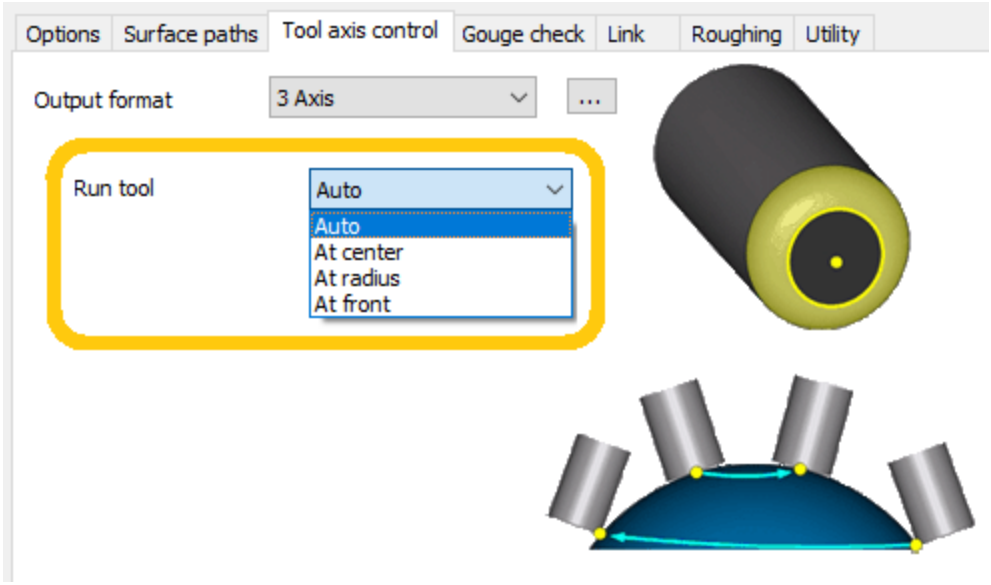
See discussion on page User control of machine orientations when cutting at singularities ("User control of machine orientations when cutting at singularities").



Toolpath calculation based on Surfaces

Project Curves: Tool axis control tab > Run tool

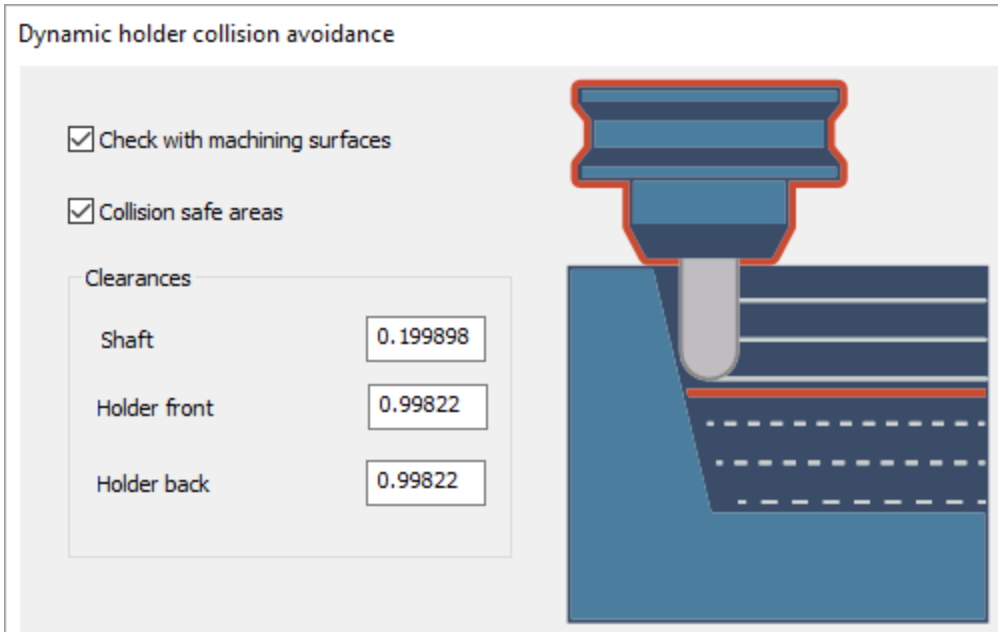
For the Surfaces strategy Project Curves, the **Tool axis control** tab offers a **Run tool** pulldown menu:



Toolpath calculation based on Triangle Mesh

DHC (Dynamic holder-collision avoidance)

Most Triangle Mesh strategies (and one Wireframe strategy, 2-Axis Rough), now offer a DHC button that summons a new dialog: **Dynamic holder collision avoidance**. A typical example is illustrated below.



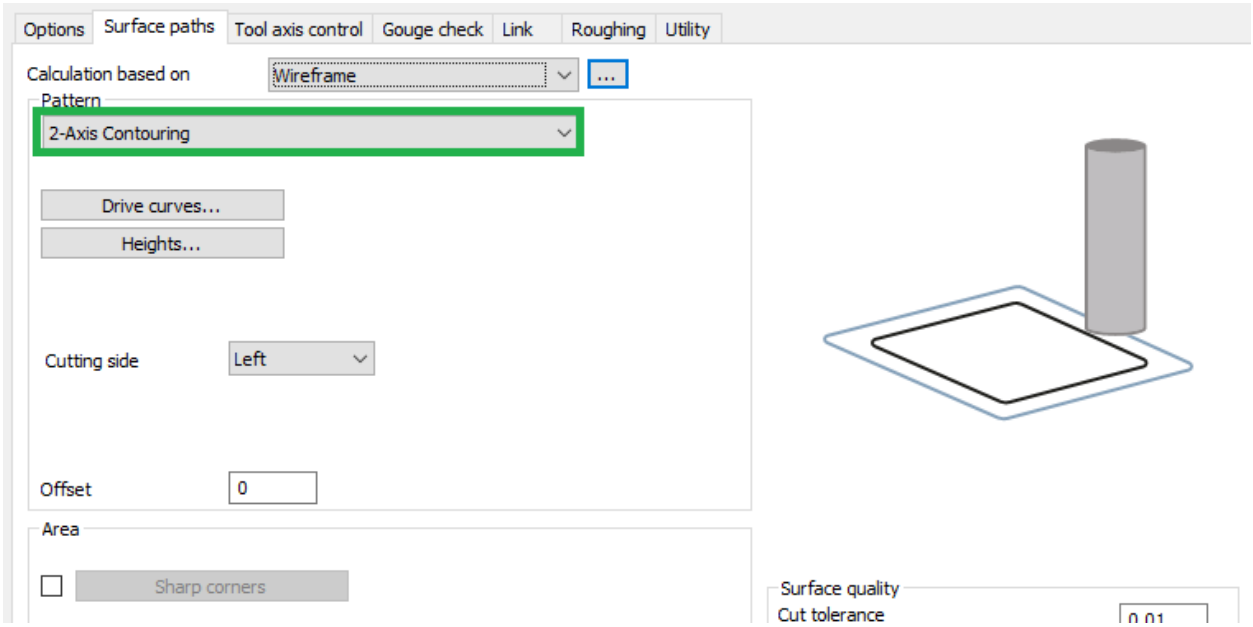
Toolpath calculation based on Wireframe

New Wireframe strategy 2-Axis Contouring

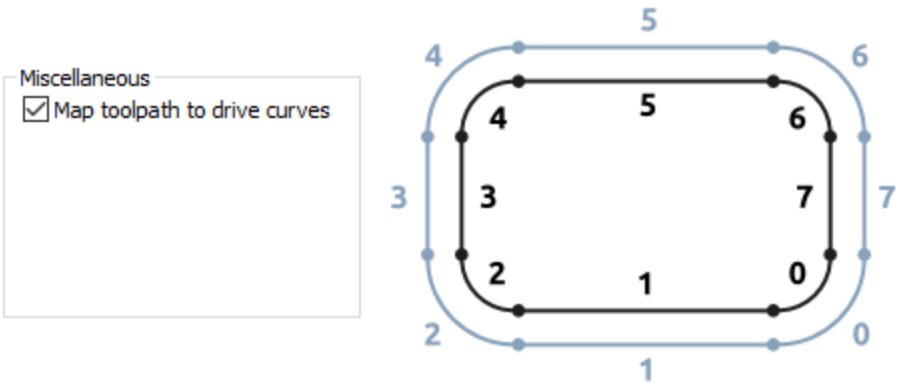
At GibbsCAM 2024, calculation based on Wireframe has a new strategy: 2-Axis Contouring.

This strategy provides simplified functionality for 2-axis machining cycle based on input curves only. Unlike the 2 Axis Profile strategy, it excludes preprocessing of drive curves for pockets or boss generation. Like other 2-axis strategies, it creates a toolpath contour in the specified Z-level.

Process information can be mapped to individual contours of the drive curve by mapping toolpath contours to drive curve features.

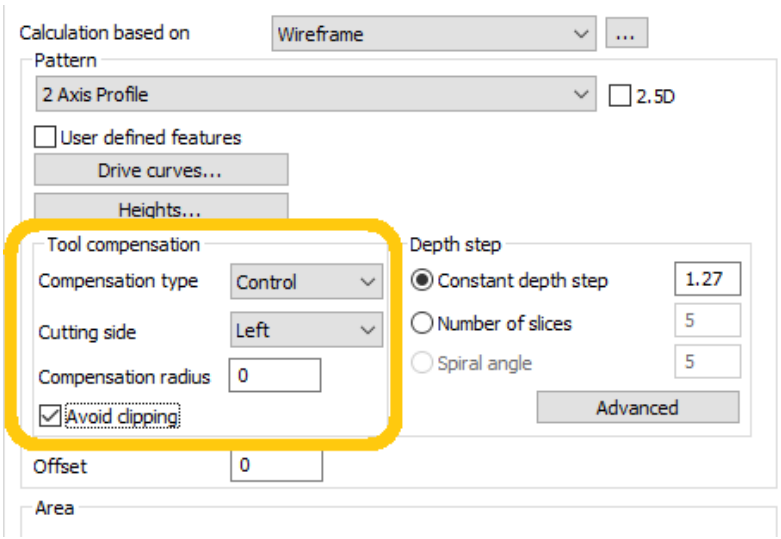


When the 2-Axis Contouring strategy is selected, the **Utility** tab offers a new checkbox: Map toolpath to drive curves.



2-Axis Profile > Tool compensation > Avoid clipping

In the **Surface path**s tab, for the 2-Axis Profile strategy, under Tool Compensation, when Compensation Type is set to Control, a new checkbox is offered: Avoid clipping. When this checkbox is ticked, the system prevents overlapping toolpath contours from merging, which might otherwise occur when CRC (cutter radius compensation) is enabled. This creates better results on some controllers when using cutter compensation, and it improves processing of narrow areas.



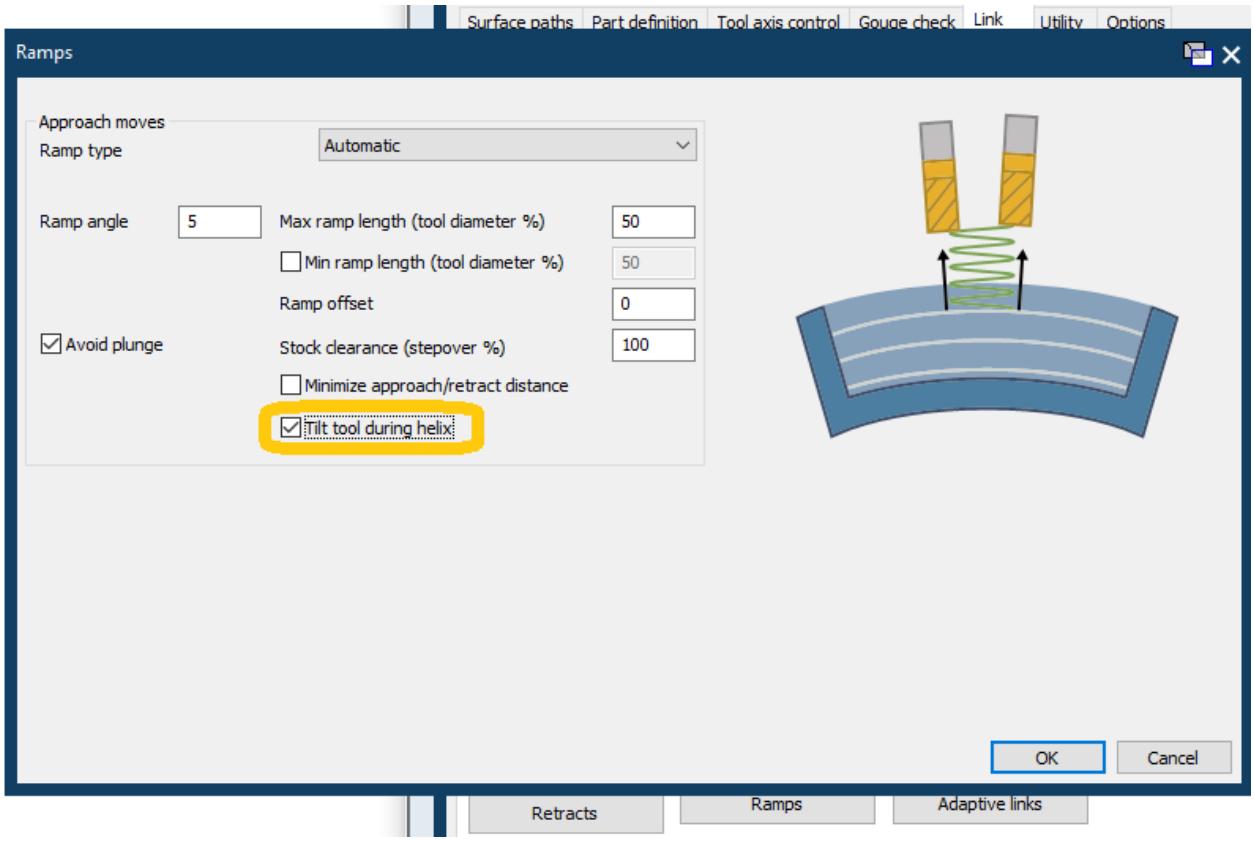
Toolpath calculation based on Multiaxis Machining

Roughing > Advanced > Extend cuts for stock

In the **Surface paths** tab, for the Multiaxis machining strategy for Roughing with pattern Offset from ceiling, the **Advanced** dialog now offers Extend cuts for stock (just as it did and still does for pattern Morph between ceiling and floor), letting you extend generated toolpath slices by offsetting them from the ceiling to the top of the stock. This is useful when the top of the stock is higher than the ceiling surface.

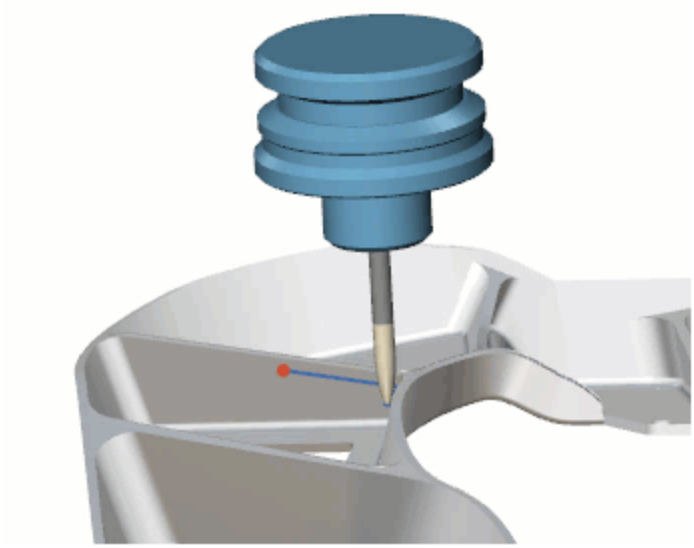
Roughing/Adaptive: Link tab > Ramps > Tilt tool during helix

When the Multiaxis machining strategy uses the Roughing machining strategy with **Type** choice Adaptive, the **Link** tab offers an **Adaptive links** dialog, and its **Ramps** dialog offers a new checkbox, Tilt tool during helix. This lets you orient the tool vector so that it is normal to the slice at every point on the helical ramp move, reducing tool overloading.



Finishing > Area > Start point

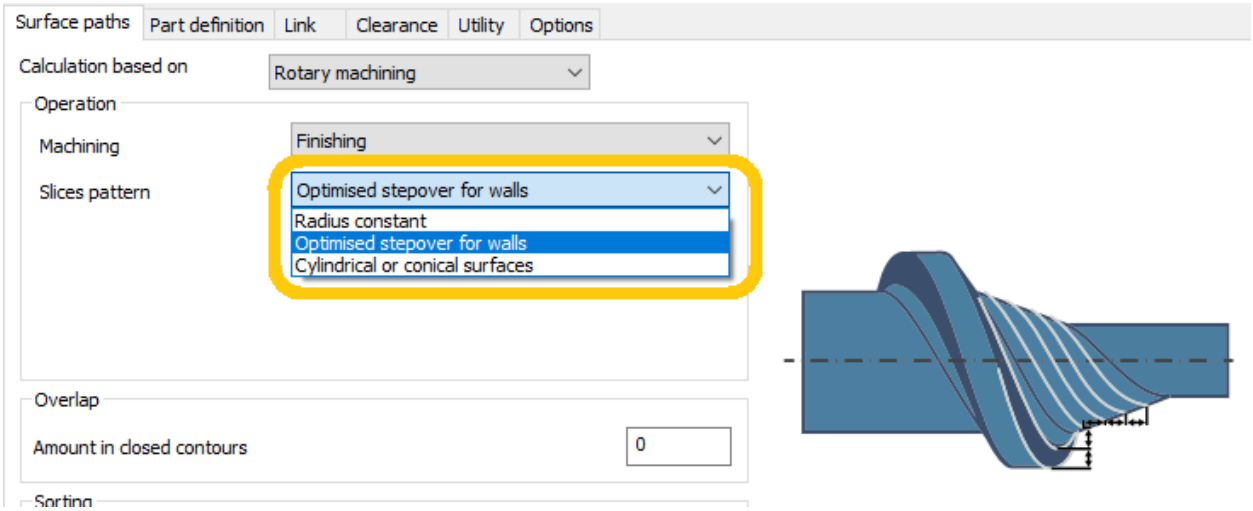
In the **Surface paths** tab, for the Multiaxis machining strategy for Finishing machining patterns, under **Area**, the Start point button summons a dialog that lets you designate a start point on any closed guide curves, providing more control and flexibility.



Toolpath calculation based on Rotary Machining

Finishing > Slices patterns Optimized stepover and Cylindrical or conical

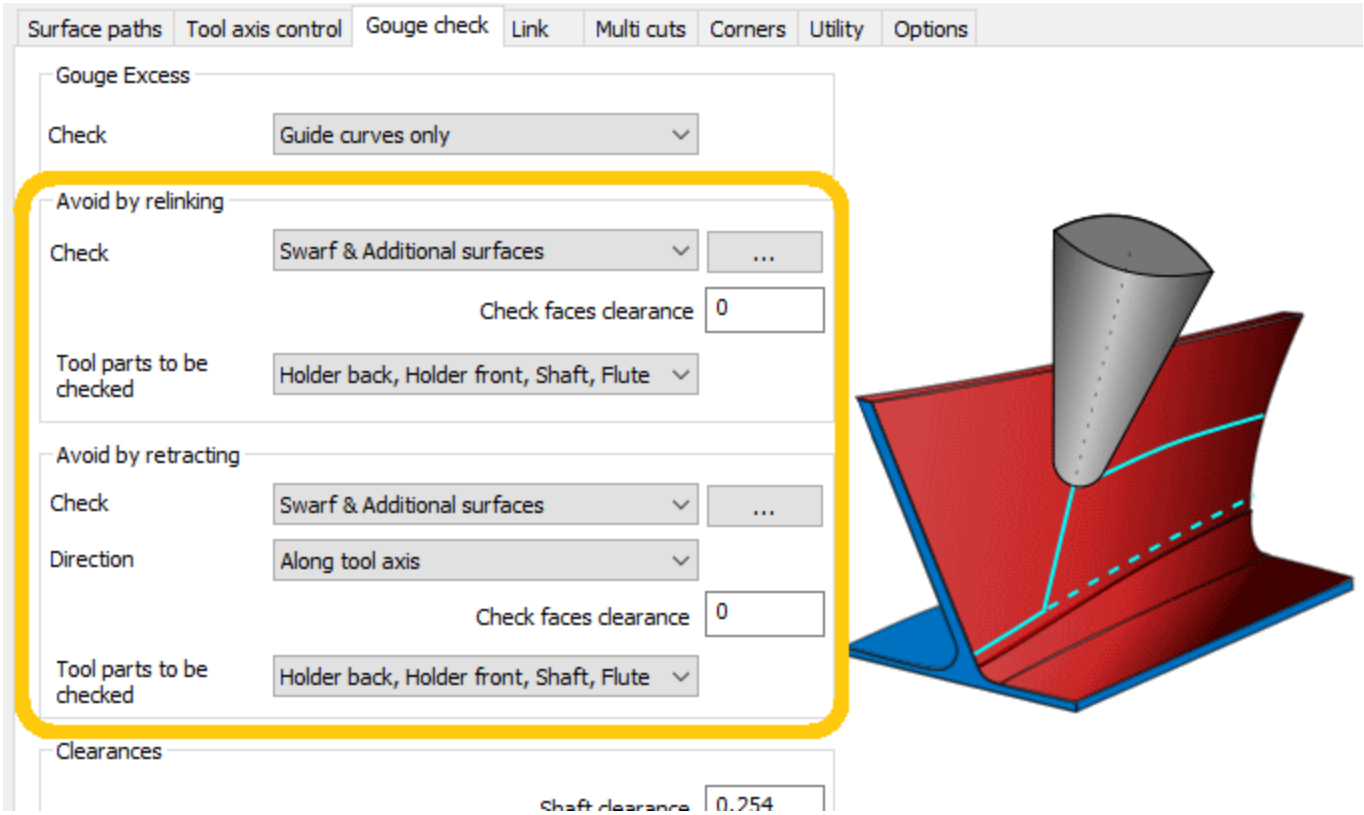
In the **Surface paths** tab, for the Rotary machining strategy for Finishing machining operations, the **Slices** pattern pulldown menu now offers menu options Optimized stepover for walls and Cylindrical or conical surfaces. Option Optimized stepover for walls produces a more consistent maximum stepover when machining curved and slanted surfaces. The minimum depth step can also be adjusted to reduce the required number of toolpaths and increase machining efficiency. Toolpaths are trimmed to ensure that machining occurs only for areas requiring additional passes.



Toolpath calculation based on Swarf Machining

Gouge check tab: Avoid by relinking and Avoid by retracting

When calculation is based on Swarf Machining, the **Gouge check** tab offers many new parameters under the areas Avoid by relinking and Avoid by retracting:



Conventions

GibbsCAM documentation uses two special fonts to represent screen text and `keystrokes or mouse actions`. Other conventions in text and graphics are used to allow quick skimming, to suppress irrelevancy, or to indicate links.

Text

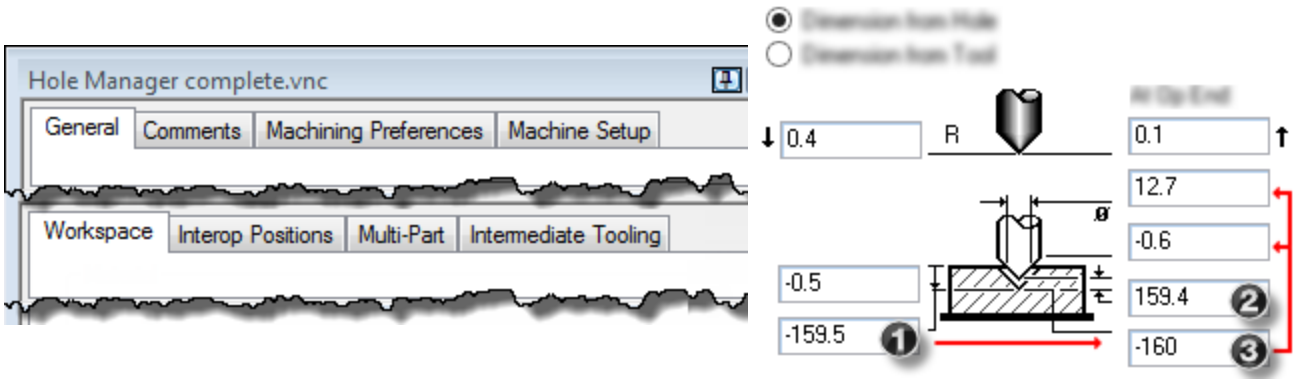
Screen text. Text with this appearance indicates text that appears in GibbsCAM or on your monitor. Typically this is a button or text for a dialog.

`Keystroke/Mouse`. Text with `this appearance` indicates a keystroke or mouse action, such as `Ctrl+C` or `right-click`.

`Code`. Text with `this appearance` indicates computer code, such as lines in a macro or a block of G-code.

Graphics

Some graphics are altered so as to de-emphasize irrelevant information. A "torn" edge signifies an intentional omission. Portions of a graphic might be blurred or dimmed to highlight the item being discussed. For example:



Annotations on a graphic are usually numbered callouts (as seen above), and sometimes include green circles, arrows, or tie-lines to focus attention on a particular portion of the graphic.

Links to Online Resources

Please contact your reseller for support.

Link	URL	Action / Description
Go	http://www.GibbsCAM.com	Opens the main website for GibbsCAM.
Go	https://online.gibbscam.com	Opens Gibbs Online page to download GibbsCAM and all supported material.