



What's New in RhinoCAM 2023

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This document describes new features and enhancements introduced in RhinoCAM 2023.

What's New in a RhinoCAM 2023

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What's New in a RhinoCAM 2023

This document describes the changes and new functionality that is being introduced with the release of the RhinoCAM 2023 product. Our latest product release is focused on improving the quality of our product. This means that our main goal is to make the product better and address any feedback or concerns our customers may have had. We have made several improvements to the product, including fixing a significant number of bugs and improving performance. We believe that these changes will enhance your experience and make the product more user-friendly. We are committed to providing a high-quality product and hope that these improvements will help to build your trust and satisfaction with our product.

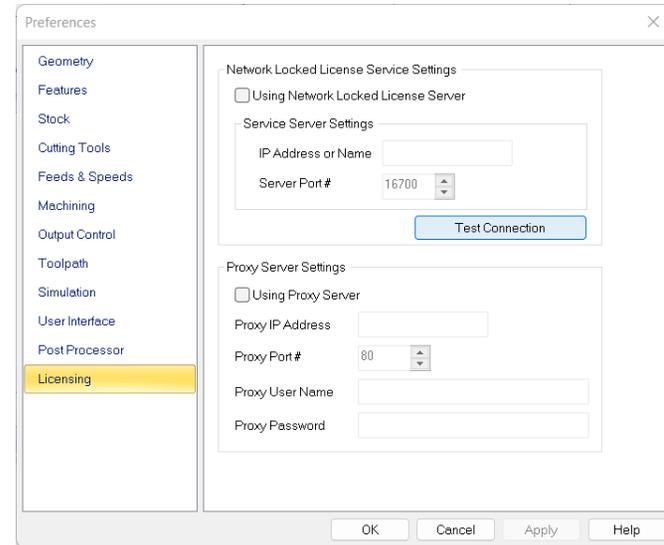
This document is organized by listing and describing each of the enhancements incorporated into the constituent modules of RhinoCAM.

COMMON ENHANCEMENTS

1. RhinoCAM 2023 has been certified to run on Windows 11.
2. A new version of the windowing system for RhinoCAM has been integrated into the 2023 product.
3. New simulation libraries from Machineworks have been incorporated into all machining modules. These libraries have improved performance significantly as well as fixed many reported issues.

LICENSING ENHANCEMENTS

1. The LAN Daemon Network license model has been phased out due to security issues inherent in CentOS. The LAN Daemon Network license model will now be replaced with the Network Locked License model, starting with this release.
2. The Network Locked license model has been more robust as well as enhanced with a more sophisticated error logging system. This will help users as well as our support personnel to trouble shoot issues with the deployment of this license model.
3. The Cloud License has been made the default license for all new licenses. This supersedes the Node Locked license that was the default licenses shipped prior to this release. The Cloud license removes the disadvantage of Node Locked license being irretrievably locked to a machine due to hardware failures.



WHAT'S NEW IN THE MILL MODULE

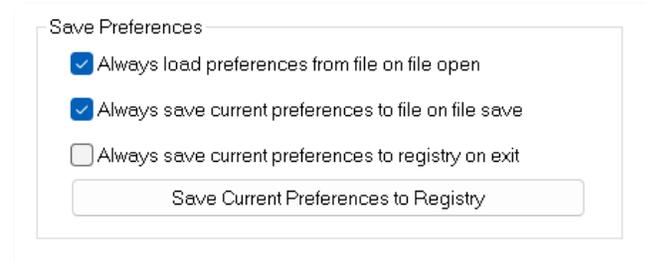
This section describes the enhancements and changes to the MILL module.

USABILITY ENHANCEMENTS

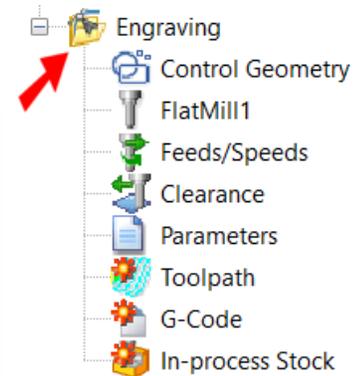
1. Three new options for controlling the file save action have been implemented.

These are:

- Always load preferences from file when opening a new file
- Save Current Preferences to Registry
- Always save current preferences to file on file save



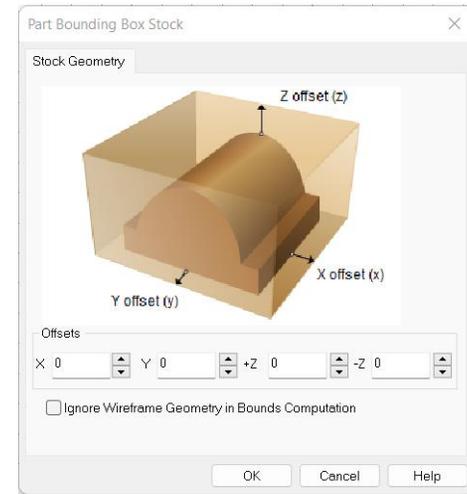
2. Edits made using toolpath editor now mark the Machining Operation folder in the browser with different symbology rather than with a Red Asterisk as before.



3. Machining and object browsers are now disabled during the toolpath generation. This prevents crashes when objects used in operations are modified or deleted while toolpath generation is taking place.

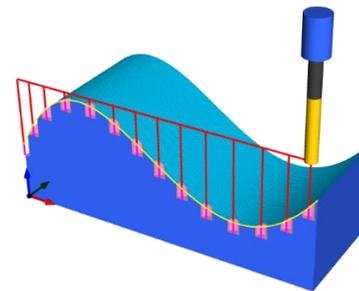
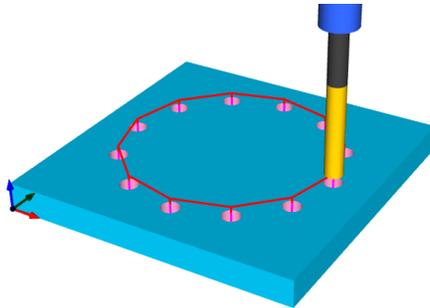
STOCK MODEL ENHANCEMENTS

1. The Part Box Stock - Z offset values can now be different for positive and negative values.



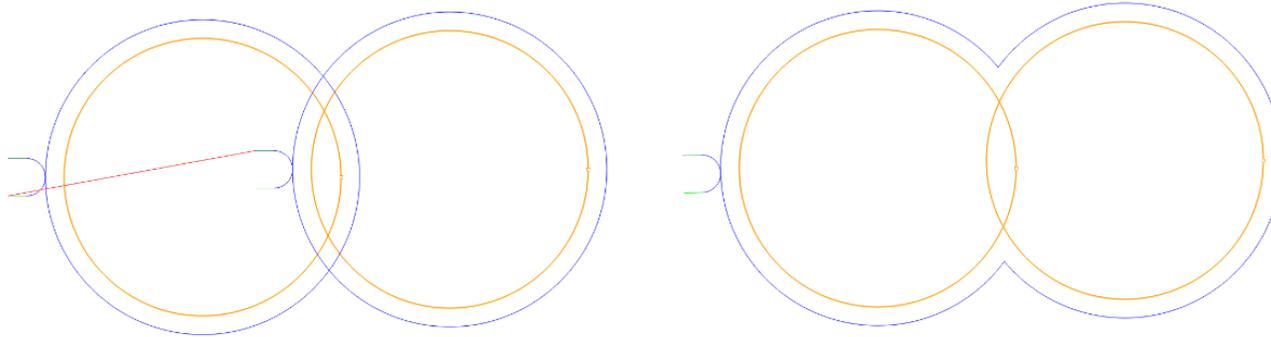
HOLE MAKING ENHANCEMENTS

1. Drilling along a curve has been implemented. This option can be used not only for drilling but as a plunge roughing toolpath using a milling tool.

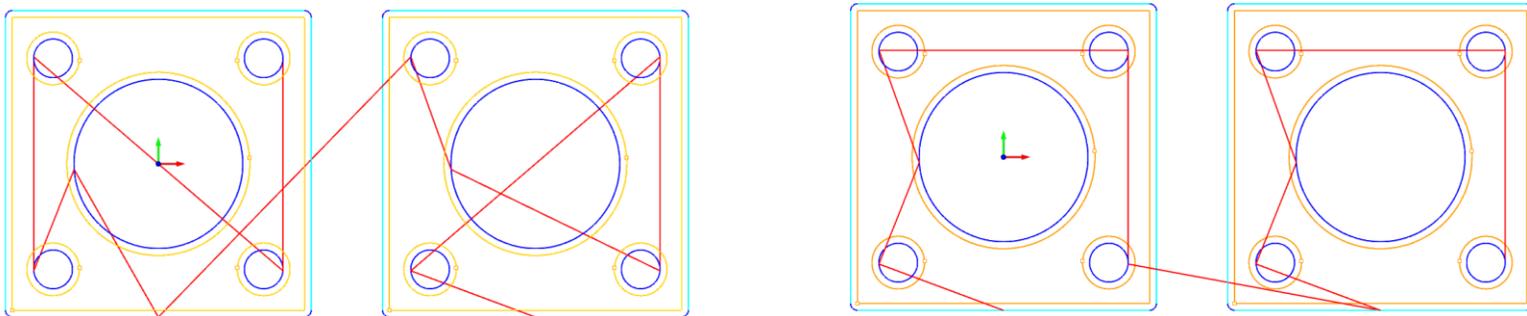


2-AXIS ENHANCEMENTS

1. The Profiling method has been enhanced to allow for checking the toolpath for interference with all selected profiles. In previous releases Profiling toolpath was created for each selected drive geometry independently. This behavior can be controlled by a parameter.



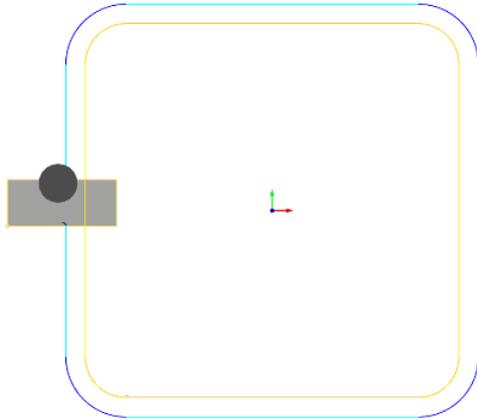
2. Interior sorting with clustering in the Profiling toolpath was implemented. That is, sorting is now applied to both the exterior cutouts AND the interior shapes of each drive geometry selected.



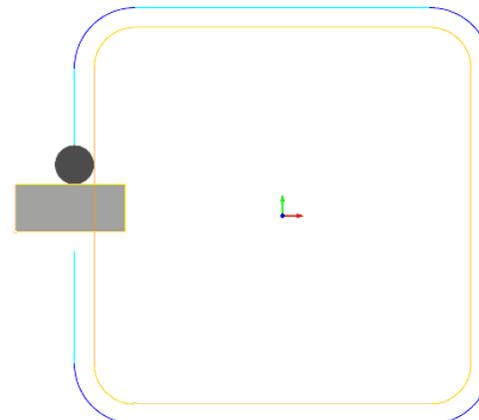
Toolpath order with clustering and sorting turned on in previous releases compared with the latest release.

What's New in a RhinoCAM 2023

3. Profiling has been enhanced when Avoid regions are selected as fixtures, to back off by tool radius rather than stop at the fixture. Users had to offset the fixture geometry before to get the desired results in previous releases.



Previous behavior where tool violates Avoid regions

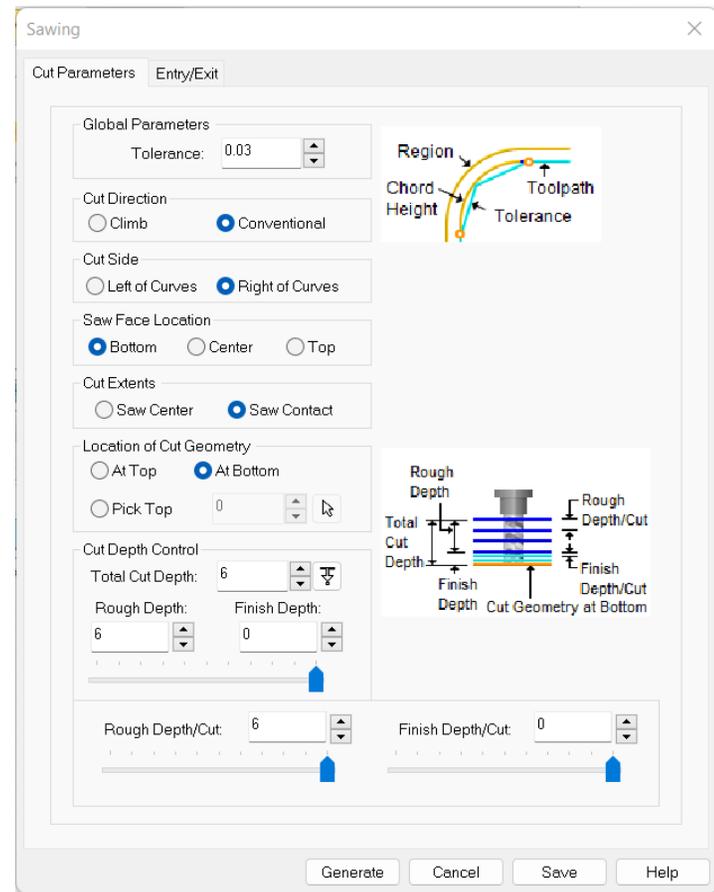


New behavior where tool stays clear of Avoid regions

4. Knife Machining has been enhanced to handle arcs without having to linearize arcs, as was done in previous releases, to handle knife rotations.
5. Saw Machining has been enhanced significantly to add multiple new options. Changes to Saw machining are as follows:

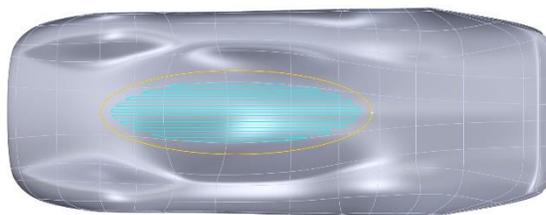
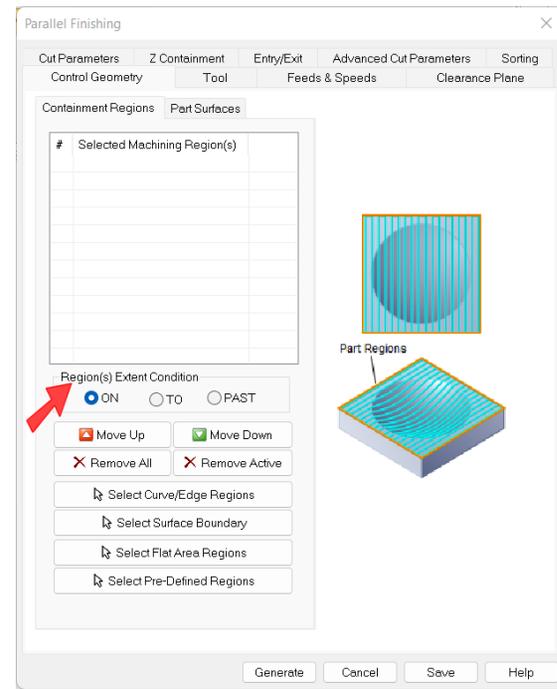
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- **Cut Extents.** In previous releases, the length of cut is limited to the shallowest impact of the saw on the stock surface. This allows for cuts that do not violate the cut geometry, thereby allowing slot cuts to be performed. However, for rip cuts, the user needed to increase the length of the drive geometry. In the new release, a parameter has been introduced to allow the length of cuts to be such that the center of the spindle starts and ends at the start and the end of the cut geometry. This behavior allows the ability to perform rip cuts. Users can now choose between these two options.
- **Cut Side:** In previous releases, the top face of the blade was aligned with the cut geometry. In the new release the user has the option of choosing to align the top, center or bottom faces of the saw to the cut geometry.
- **Cut Direction:** Users can now choose between climb and conventional cutting in the Saw machining operation.

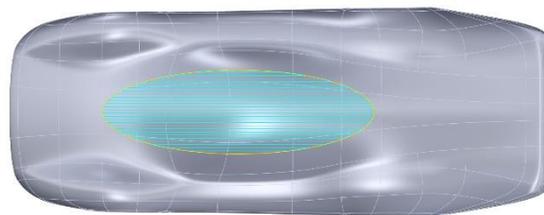


3-AXIS ENHANCEMENTS

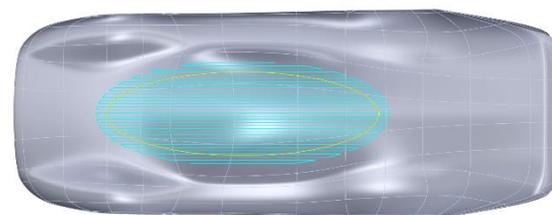
1. ON/TO/PAST tool conditions have been implemented for controlling tool position relative to Drive Regions, in all relevant 3 Axis Machining operations. An example of how these different settings affect the toolpath is shown below.



TO Tool Condition

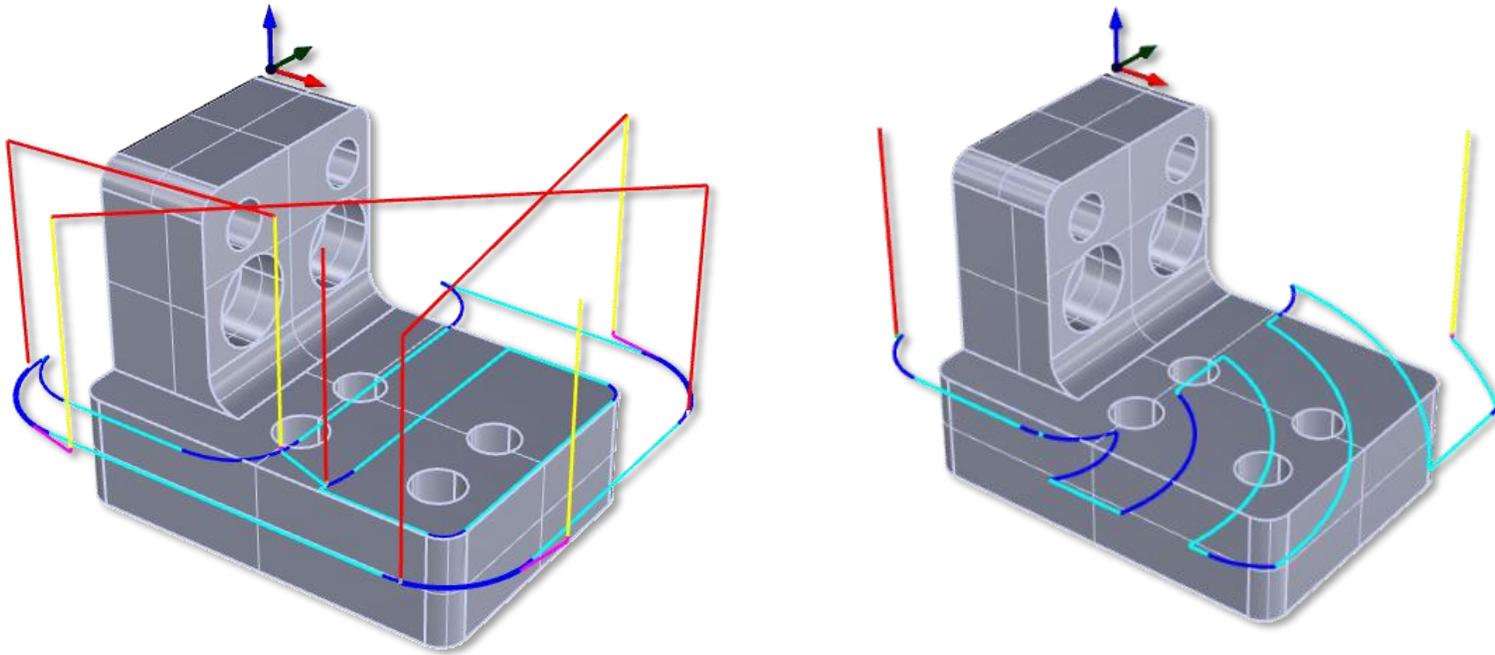


ON Tool Condition



PAST Tool Condition

2. Clear Flats Machining in Horizontal Roughing has been made more intelligent in that the tool now is prevented from plunging/ramping into uncut area if there is at least one side open where an entry can be generated. An example is shown below.

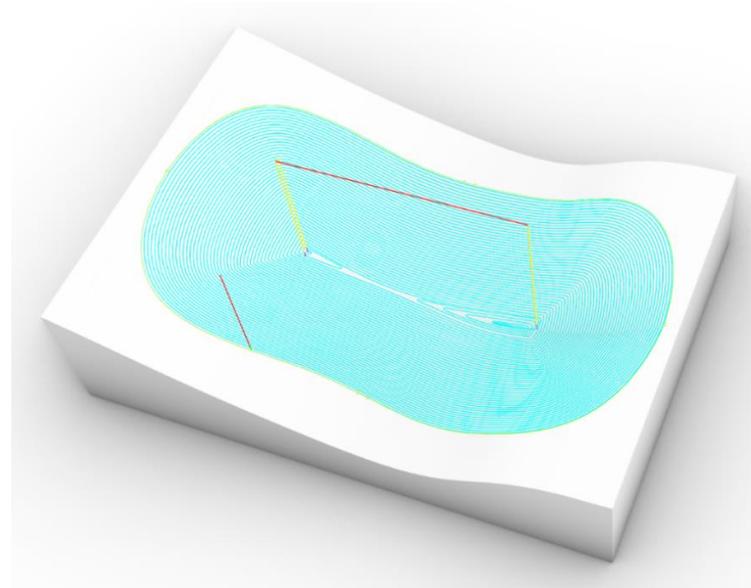
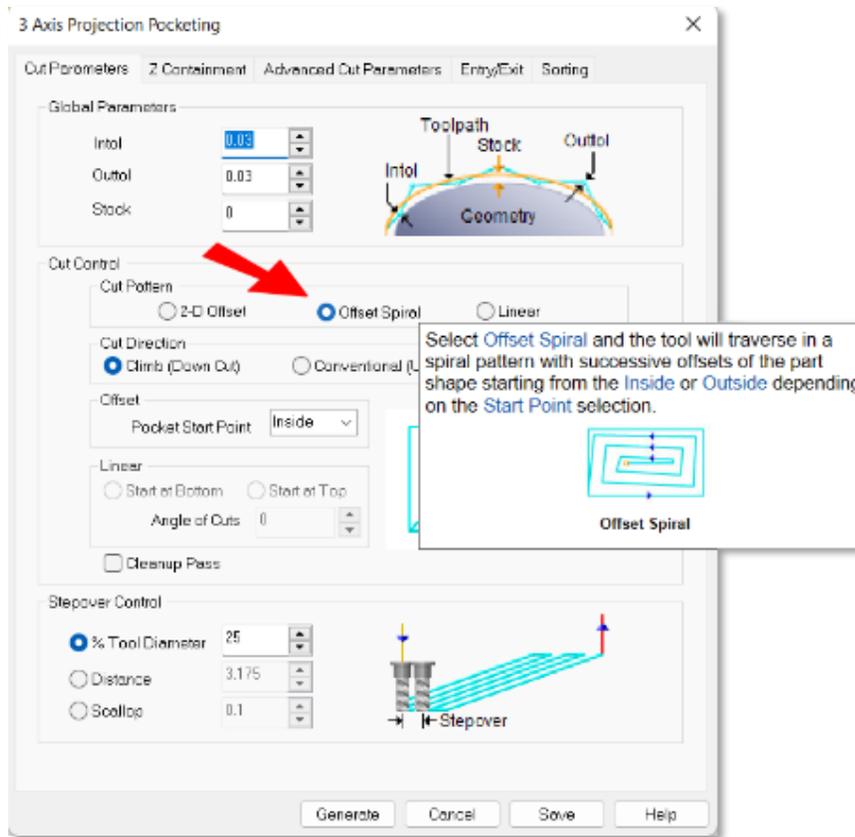


Previous behavior where tool enters the level to be cut next to the boss

New behavior where tool plunges outside in air and works its way in

3. A new Spiral Offset method has been added to the 3 Axis Projection Pocketing Machining Operation. The dialog and the toolpath are shown below.

What's New in a RhinoCAM 2023



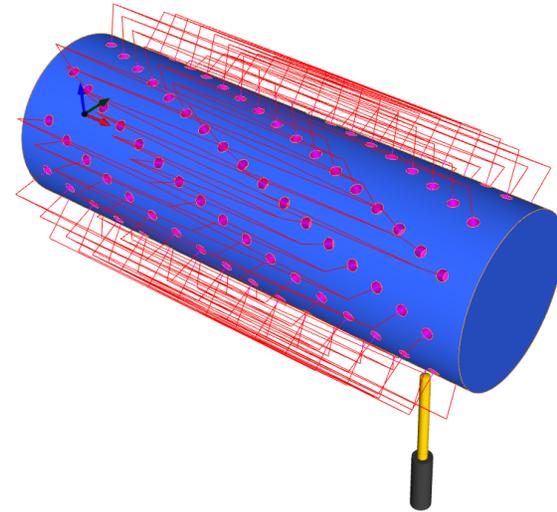
- Users interface settings have been unified for both cavity/pocket and core/facing tabs in both the Horizontal Roughing operation dialog.

4 AXIS TOOLPATH ENHANCEMENTS

1. 4 Axis drilling along a curve was implemented. This method can be used not only for drilling but as a plunge roughing toolpath using a milling tool.



Part with curves selected for drilling



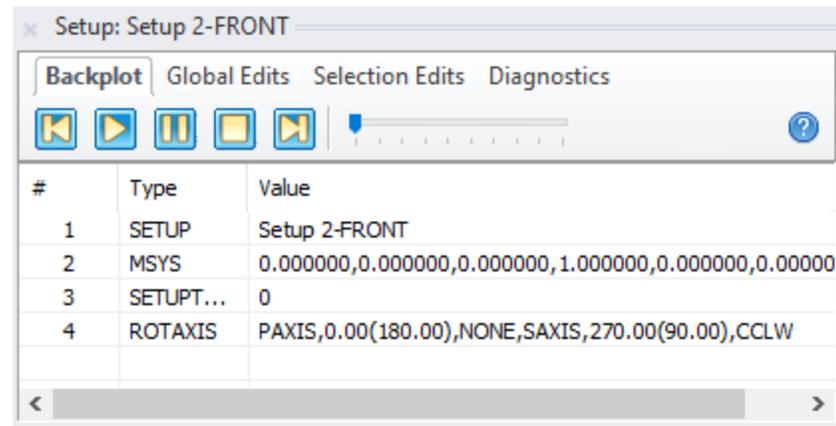
Simulated part with holes drilled along selected curves

2. 4 Axis Head configuration toolpath computations has been enhanced to handle tool compensation for older machines that cannot compensate for tool length automatically.
3. 4 Axis continuous toolpath computations for Local Coordinate output has been changed and made more robust

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5 AXIS TOOLPATH ENHANCEMENTS

1. The machine rotation angles corresponding to the secondary solution is always computed and output for each 3+2 Setup orientation and each 5 axis continuous machining tool motions. In addition to this primary axis angles are now computed taking into account the XY axes of the coordinate system instead of just the tool axis as was done in previous releases.



Angles corresponding to the secondary solution are being computed as shown in the toolpath editor

2. A button to Reverse normal direction for CSYS Setups in the CSYS Setup dialog was implemented.
3. New toolpath generation libraries for 5 axis machining have been integrated with the 2023 products. This implements bug-fixes and performance improvements in 5 Axis continuous machining.

SIMULATION ENHANCEMENTS

1. New Machineworks simulation libraries have been integrated with the 2023 product. These libraries fix various bugs as well as implement some performance optimizations.

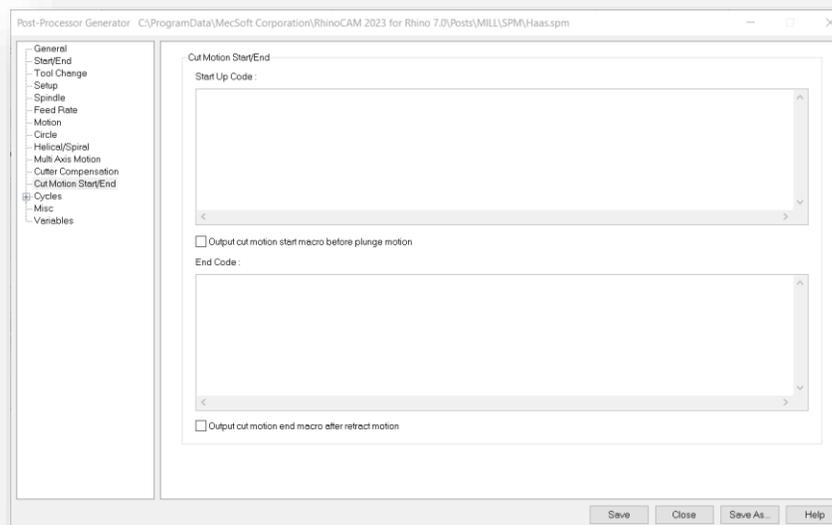
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MACHINE TOOL SIMULATION ENHANCEMENTS

1. Additional machine tool models have been added as part of the installed machine tool simulation library.

POST PROCESSOR ENHANCEMENTS

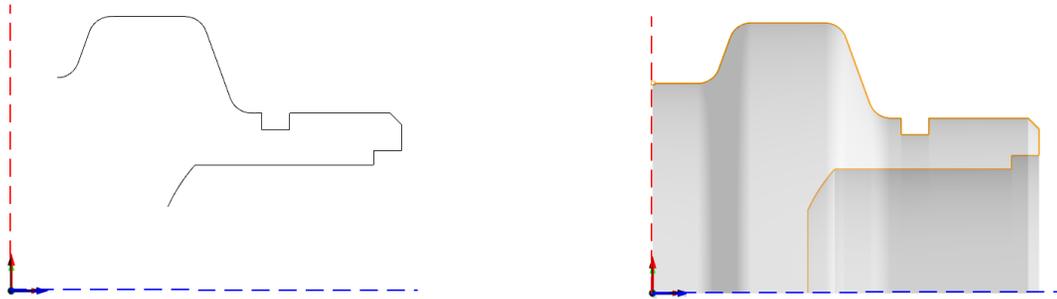
1. The ability to add macros in legacy posts for First/Last G0/G1 Motions was implemented. This is shown in the post-process editor below



2. Posting using the stored post-processor as a temporary file was implemented. This prevents existing posts on disk from being overwritten by the saved posts in the part file.
3. Add ability to get values of the machining parameters in programmable posts was implemented
4. Enhancement to add the machining definition as a variable for programmable posting
5. New variables to get the alternative solution pair in 5 axis operations has been implemented
6. A function to write data to post file directly from the python script was implemented
7. [COOLANT_OFF] macro code is now triggered at the end of an operation to enable output of macros when turning off the coolant

WHAT'S NEW IN THE TURN MODULE

1. The restriction of part geometry to touch the X axis has been removed. The part will be extended to touch the X axis as shown below.



2. When machining using an ID finishing operation, the tool now retracts to the front of the part after operation is completed to prevent gouging.



3. Parting off toolpath now honors the program point defined in the parting off tool.

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RHINOCAM API ENHANCEMENTS

1. Added support for Sawing and Knife Cutting operations
2. Added functions to get/set Cutting Side parameters for Profiling Machining Operation.
3. Added Machining Operation objects for all Machining Operation types.

BUGS FIXED

Numerous bugs have been fixed to make the product more reliable, robust and user friendly.

1. Horizontal Roughing depth-first z-levels sorting was fixed for intersecting loops
2. Browsers remain open when RhinoCAM is unloaded from the Main Menu
3. Post-processor issue with outputting variables specified inside “[” and “]” symbols was fixed
4. Fixed bug with angle calcs when toolaxis[2] = -1 for CA configurations
5. Fixed issue with loading CAM plugin on the first run
6. Saw tool orientation (visibly and angle code) is incorrect when set to larger than zero was fixed
7. 4 and 5-axis issue "if output on local Coordinate system is chosen, the results are incorrect" was fixed
8. Smooth cut connections not working for horizontal roughing was fixed
9. Smooth cut connections fail to apply in 2 axis facing operations was fixed
10. In the Machining Objects Browser "Load Tool Library" & "Select Tools from Library" are not working." was fixed
11. Cut connections in 3 Axis Parallel Finish with surface as control geo results in incorrect toolpath boundary was fixed
12. 2 axis profiling mop collides with fixture definitions in specific test cases was fixed
13. Optimized cycle output is ignored when mirrored toolpath is applied was fixed
14. Fixed issue with error message on opening Machining Operation creation dialogs
15. 2 Axis profile radial entry/exit fails when curves are offset less than the tool diameter was fixed
16. Max Distance Change parameter was not used in the 5-Axis flow curve machining issue was fixed
17. MOPs are disappearing from the Machining Job tree due to tool library issue was fixed
18. Clear flats in Horizontal Roughing fails for most of the cut patterns in certain test cases was fixed
19. Post-Processor variables [ANGLE_ROLL,][ANGLE_PITCH] and [ANGLE_YAW] are incorrect in some cases was fixed
20. Export to VCP exceptions were fixed
21. Explode cabinet design crashes system to desktop for some parts was fixed

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22. 2 ½ Axis profiling fails for this simple case of 3 lines. was fixed
23. Fixed an issue with 5 Axis operations after rotated setup
24. Fixed an issue with Feedrate output after motion code, if motion defined by [NEXT_*_WCS] variables
25. CAM data save issue was fixed
26. The "New post detected" dialog was moved to the "OnPostProcess" event
27. Post-processor full filename issue was fixed
28. When loading certain files with saved posts, the Post name shows None was fixed
29. Issue with block format data length limit for programmable post was fixed
30. Implemented function to write data to post file directly from the python script
31. Minor updates for Cloud and Network licensing
32. Changes for Saw machining to output tool/shaft end rather than the tool center
33. Updated tooltip list for CAM installers
34. In the Profile-NEST module, G-Code is not being updated when Execute Nest is selected or when a nested sheet is regenerated
35. Updated Sawing toolpath generation. Fixed issue with clearance plane, added additional offset that Saw tool will be higher than clearance plane.
36. G-Code for all mops in a setup are not being generated when a Setup is regenerated
37. G-code is not being generated for any mops within a MOpSet
38. G-code is not being generated for operations generated from the Automatic Feature Machining
39. Export to VCP file was fixed to handle objects layer issues
40. V-Mill gouges the control geometry in 2 axis hole pocketing was fixed.
41. Now the system forces users to set the Post and not picking the first one by default.
42. 2 axis facing & 3Axis Parallel Finishing with a Face Milling cutter does not cut to the full perimeter was fixed
43. Layer Thicknesses are being corrupted when importing part files" was fixed
44. Mops are taking 10-50x longer to generate than in previous versions was fixed
45. The Browser names appear misshapen problem was fixed
46. Retuning as Node Locked if concurrent license and lease expiry date is set to 0
47. Changing pick buttons based on customer input
48. Changing the Post folder to view field to be write enabled
49. Outputting ROTAXIS to APT CLS
50. Tool in library is being corrupted when saved and loaded in v2022 was fixed
51. Facing with Stock Model Silhouette checked fails was fixed
52. Fillet mill cuts incorrect side when "Use 3D Model" is selected.

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53. Determine using 3d model for cut start side, cuts on the wrong side for one of the chamfers in the attached test case
54. Chamfer cuts wrong side when determine using 3D model is selected is this part
55. Determine using 3D model for cutting side cuts on the wrong side in 2 axis profiling for attached test case
56. When pasting or cloning a mop, the Mop's name has been changed to "Copy of" for less confusion
57. The Post & Save As dialog as well as the Post Folder selection dialogs have now been made resizable
58. [COOLANT_OFF] code is now triggered at the end of an operation.
59. Tool library saved as csv and imported back as csv drops all tool holders was fixed
60. If no existing post, then set the default post for new files to "Post - None"
61. Duplicate holders are created when loading the same tool library twice.
62. Tools are not being updated when you Drag-n-Drop from a tool library was fixed
63. Feedrate value not being saved in Knowledge Bases file was fixed
64. Mops are being deleted when a tool library with holders is loaded twice was fixed
65. Holder taper angle limit was increased to 89 degrees
66. Administrator rights request was added to the License Manager application
67. Shells export to VCP was fixed
68. Adding Name input in Network Locked License preferences
69. Flute length changes automatically when Corner radius is set was fixed
70. Implemented an option to disable saving data to registry on application close
71. Save As Defaults resets default kb to factory settings was fixed
72. Reset settings to factory defaults and the Load from File Feeds/Speeds dialog will not populate was fixed
73. 5-axis problem with polar XY instances was fixed
74. 5 axis clearance as "Plane" errors and will not generate. was fixed
75. Clear flats in Horizontal Roughing does not clear all flat areas in certain conditions was fixed
76. The Explode Cabinet function menu entry has been removed from the TURN module
77. Turn part menu has no mouse-over color like the other menus do issue has been fixed
78. In the Turn module, right-click and select Delete Dirty MOPs, deletes ALL MOPs in the setup was fixed
79. Tool width compensation issue with ID groove operation in Turn module when program point is set to Left or Right was fixed
80. The Ribbon bar icons are not correct for Profile Nest and the G-code browser was fixed
81. MESH module becomes unusable when opening a point data file was fixed
82. RhinoCAM API: Regenerated Tool path does not have DRILL CYCLE issue fixed

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- 83. RhinoCAM API: Circle created in current execution is not added to Drill Operations geometry even though all objects on current layer are selected was fixed
- 84. RhinoCAM API: Drilling tool names are now being returned correctly
- 85. RhinoCAM API: Post output file always have *.nc extension, even when output file extension specified in *.spm file issue fixed