102-NF-22000

FFCAM 2022

Description of New Functions

MAKINO

Promise of Performance

Preface

This manual describes the functions added to MAKINO FFAUT 2022 and how to use them.

Created on

March 2022

FFCAM 2022 List of Functions Added

1. Added Flat Face Machining Control Function to Contour Projection

A function to control the machining of flat faces has been added to Projection settings of Contour Projection.

This function prevents tool path for Projection from being output to flat faces to avoid machining the flat faces when tilt areas are machined with Projection.

Flat faces are used when it is more efficient to process the flat faces separately by Flat Face Machining.

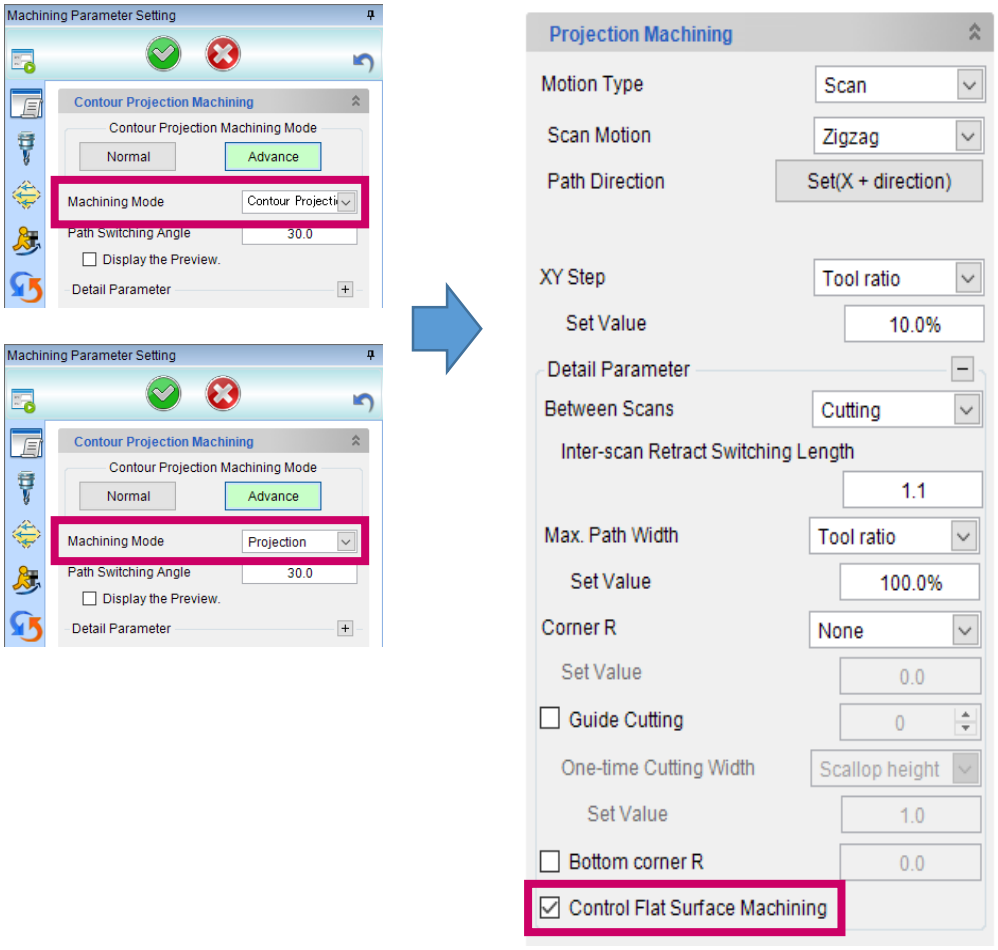
■ Setting Screen

Contour Projection Machining - Set Screen

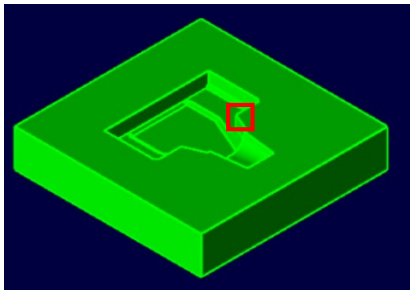
Select the function to control flat face machining from [Advance] of [Contour Projection Machining].

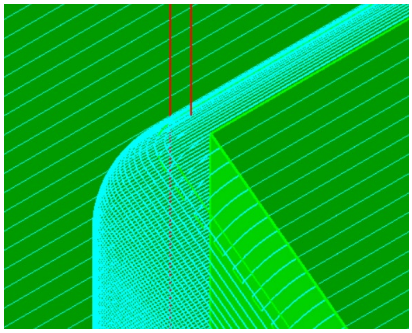
When [Machining Mode] is set to [Contour Projection] or [Projection], settings are made in the [Projection Machining] setting screen.

When the [Control Flat Surface Machining] checkbox is checked in [Detail Parameter] of the [Projection Machining] setting screen, the Control Flat Surface Machining is applied.

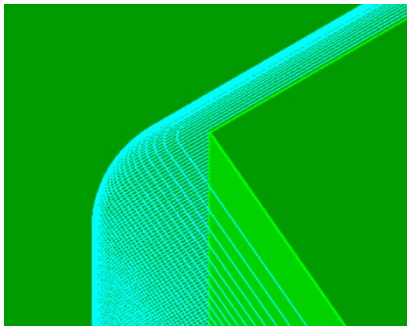


Examples of Path Outputs





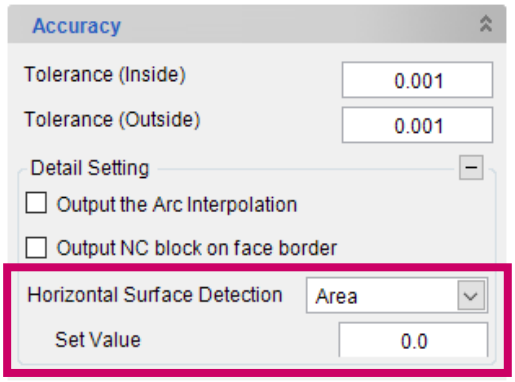
When Control Flat Face Machining is not used



When Control Flat Face Machining is used

■ Supplementary Note

Even when [Machining Mode] is set to [Contour Projection] and [Control Flat Surface Machining] is selected, [Horizontal Surface Detection] in [Finish Allowance/Accuracy Setting] can also be set.



2. Added the Stock File Name Automatic Update Function to [Stock Model Input]

A function has been added to automatically update the stock file name set in [Stock Model Input] when the machining name of the machining data to be imported is changed.

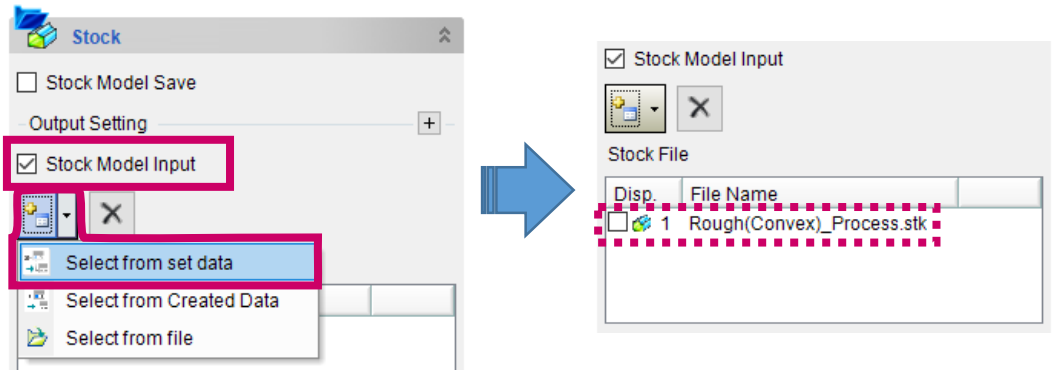
In the previous version of FFCAM, when the machining name of the machining data to be imported changed, it was necessary to update the corresponding stock file names one by one manually.

In FFCAM 2022, since stock file names are automatically updated, the stock file names need not be updated manually and errors due to missing the updates can be avoided.

■ Operation Screen

Machining Data to Set [Stock Model Input]

In [Stock] of [Uncut Model Setting], select the checkbox of the [Stock Model Input]. Specify the machining name of the machining data to be imported from the "Select from set data" pull-down list. (Similar to the previous procedure)

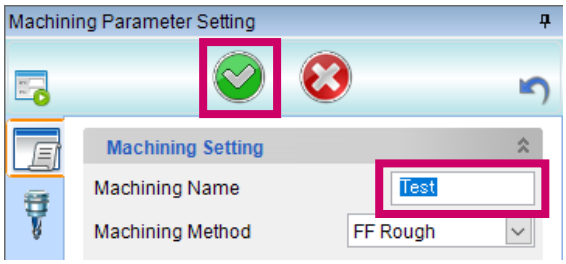


* The function to update the name automatically cannot be used when the machining name is specified by "Select from Created Data" or "Select from file".

Machining data to be imported

Change the machining name of the machining data to be imported.

Click  .

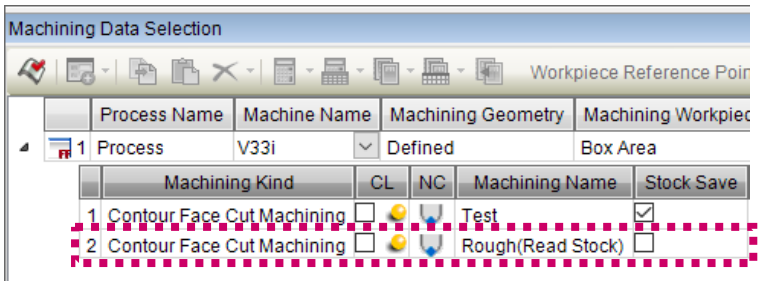


* Change of name by the following are covered by the automatic update function.

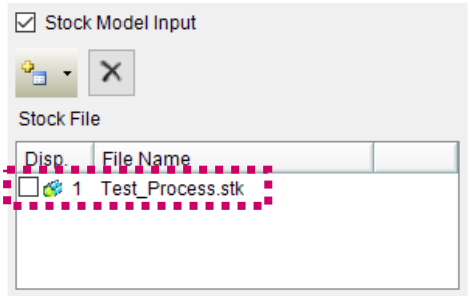
- Change the machining name (including changes by the auto-numbering function)
- Change the process name (including changes by copying the process)

Machining data with [Stock Model Input] set

The [CL] status of the machining data with [Stock Model Input] set in the [Machining Data Selection] window will also change to yellow.



When the machining data with [Stock Model Input] set is opened, the stock file name is automatically updated.



■ Note

The following are not covered by the automatic update function for stock file name.

- When machining data is copied within the same process
- When machining data is copied from different processes
- When copying machining data from other work data (xMtn file)
- When changing the process name and machining name by using macros

3. Added a Function to Copy the Machining Range Set in the [Machining Area] to the [Non-machining Area]

The area set in [Machining Area] or [Non-machining Area] of each machining can now be used by copying to [Machining Area] or [Non-machining Area] of other machining.

* The area that is set in the [Non-machining Area] of other machining can be copied to the [Machining Area].

  Similarly, the area that is set in the [Machining Area] of other machining can be copied to the [Non-machining Area].

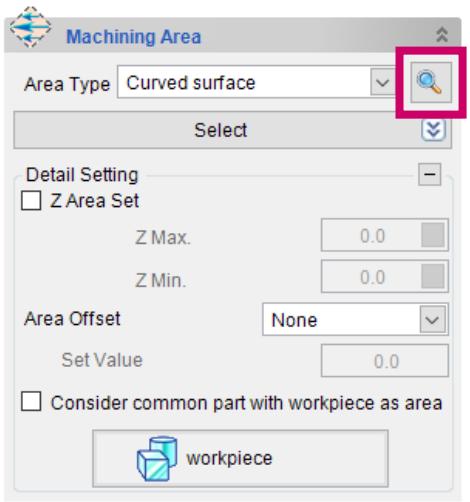
Copy the area using the  button displayed in [Area Type] of [Machining Area] or [Non-machining Area] in the area setting screen of each machining.

* Only copy areas of machining for which the [Area Type] is set to [Curve] or [Curved surface] in the same process can be copied.

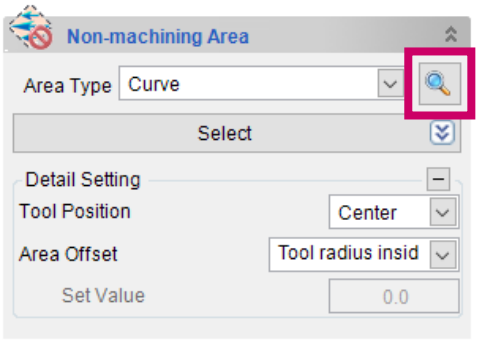
■ Operation Screen

1. On clicking the  button displayed in [Area Type] of [Machining Area] or [Non-machining Area], the [Select Area] window is displayed.

Machining Area

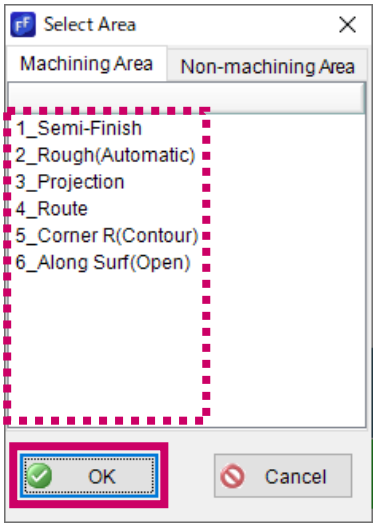


Non-machining Area



* The  button is enabled only when [Area Type] is set to [Curve] or [Curved surface].

2. Select the machining to copy the area from the machining names listed in the [Select Area] window. Click [OK] to copy the areas of the selected machining.



■ Select Area screen

Machining Area (tab)
For machining of the same process, the name of the machining with area set in [Machining Area] is displayed in the list.

Non-machining Area (tab)
For machining of the same process, the name of the machining with area set in [Non-machining Area] is displayed in the list.

List
If [Curve] is selected as [Area Type], the name of the machining with the [Curve] area is displayed, and if [Curved surface] is selected as [Area Type], the name of the machining with the [Curved surface] area is displayed.

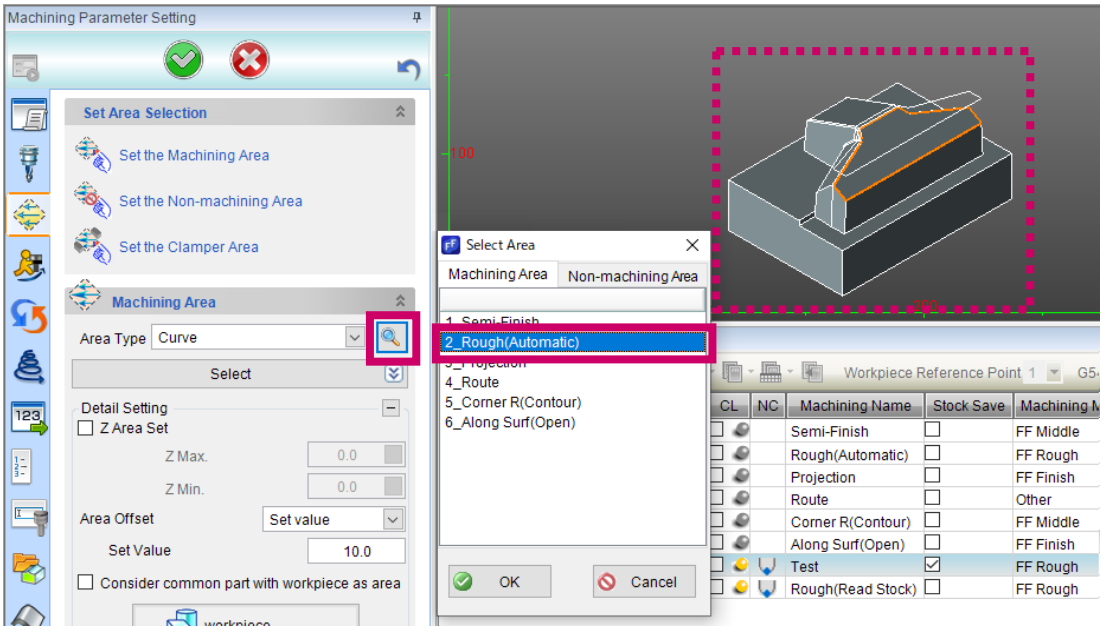
OK
Copies the areas of the machining selected in the "List".
In this case, the specified value for [Tool Radius Inside] or [Tool Radius Outside] in [Area Offset] is calculated and applied from the tool diameter of the machining from which the area is copied.

Cancel
Cancels the operation and closes the [Select Area] window.

■ Example of operation screen (when the machining from which the area is copied is selected)

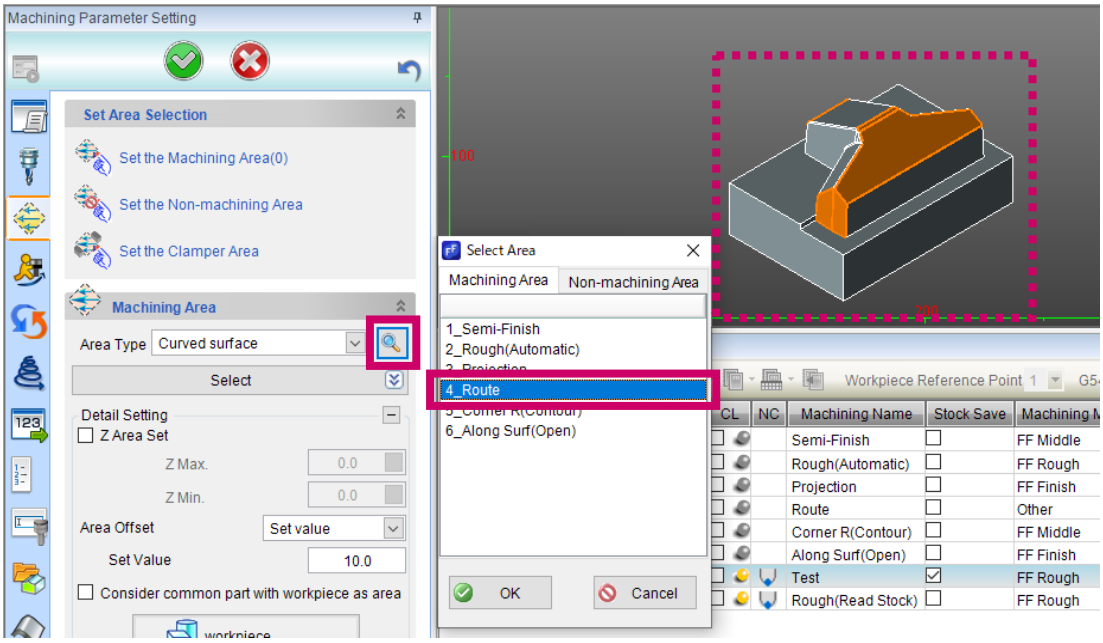
Copy a curved area

The curved area set in the selected machining is highlighted and the guide lines are



Copy a curved surface area

The curved surface area set in the selected machining is highlighted.



4. [Machine Parameters] Improvement to Enable Setting the NC File Extension for Each Machine

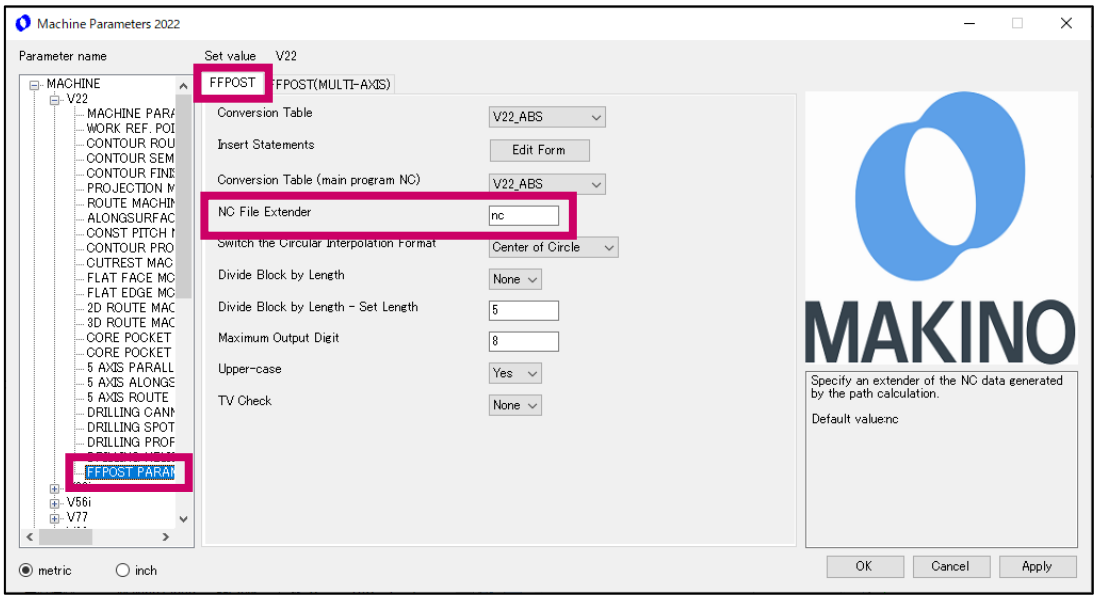
The NC file extension to be output can now be set for each machine.

Along with this change, the setting options of [NC File Extender] in machine parameters have been moved from [NC Output Parameter] to [FFPOST PARAMETER] of each machine.

■ Setting Screen

The [NC File Extender] can be set in the [FFPOST PARAMETER] -> [FFPOST] tab of each machine.

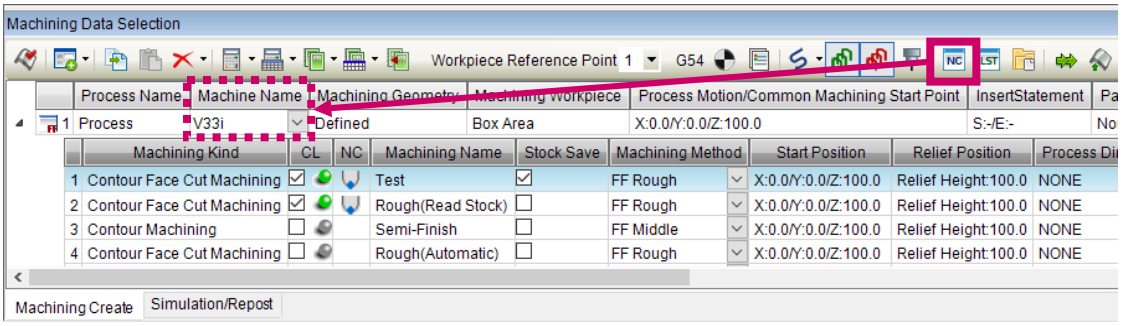
Machine Parameters [FFPOST] screen



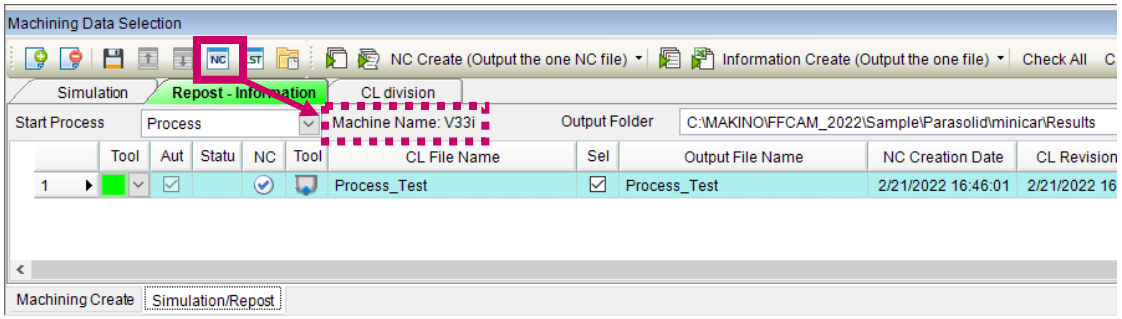
* The [Output Filename Setting] tab in [NC Output Parameter] in which the [NC File Extender] was previously set has been removed.

The NC file extension set for each machine are referenced by the Machining Data Setting screen in the following cases.
Opens the NC file with the extension set for the machine displayed in the machine name when the NC ([Open the NC File]) button is clicked.

Machining Create screen



Repost - Information screen



5. [Machine Parameters] Improvement to Enable the Setting of [Safety mode at hole ATC] for Each Machine

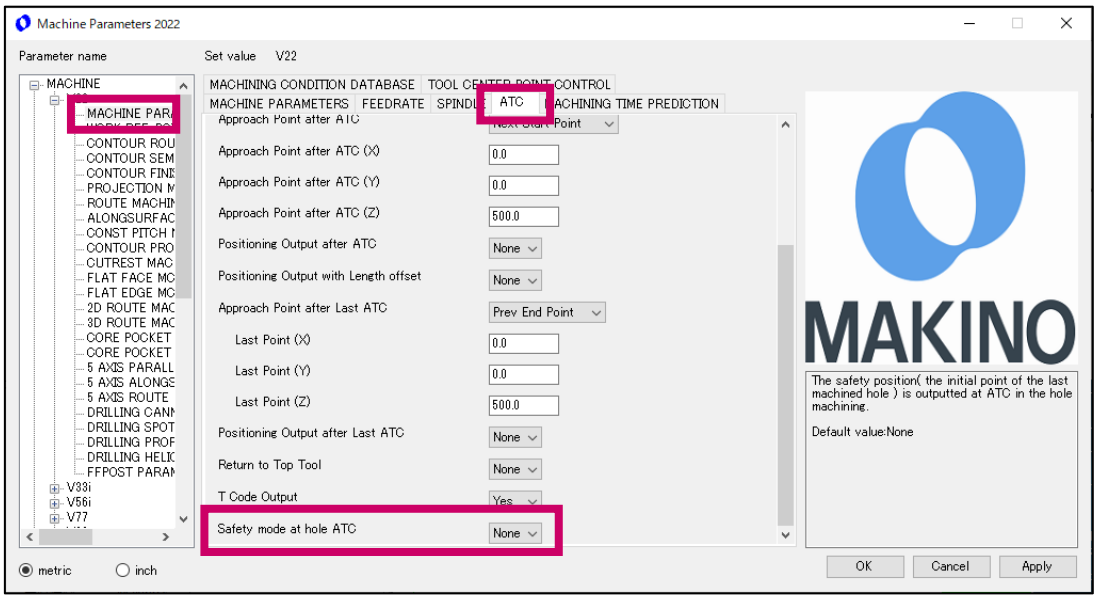
The [Safety mode at hole ATC] can now be set for each machine.

Along with this change, the setting options of [Safety mode at hole ATC] in the machine parameters have been moved from [NC Output Parameter] to [MACHINE PARAMETER] for each machine.

■ Setting Screen

The [Safety mode at hole ATC] can be set in the [MACHINE PARAMETER] -> [ATC] tab of each machine.

Machine Parameters [ATC] screen



* The options of [Safety mode at hole ATC] in [NC Output Parameter] -> [Path Parameter Setting], which was used to set the [Safety mode at hole ATC], has been removed.

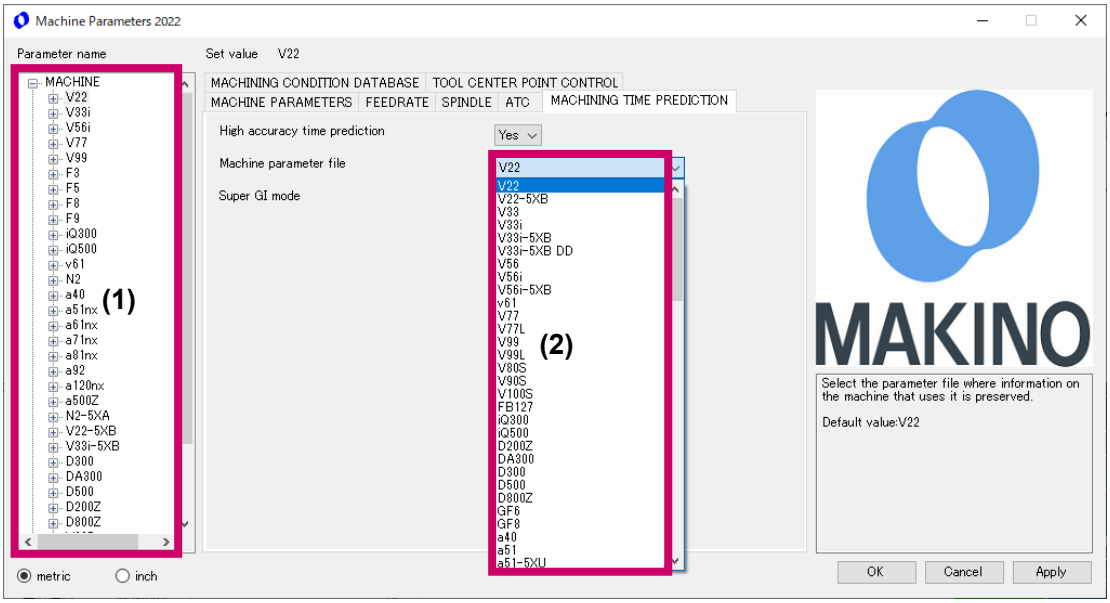
6. [Machine Parameters] Added New Models to the Machine List

New models have been added to the machine list of Machine Parameters.

■ Setting Screen

New models have been added to each part of the Machine Parameters.

Machine Parameters screen

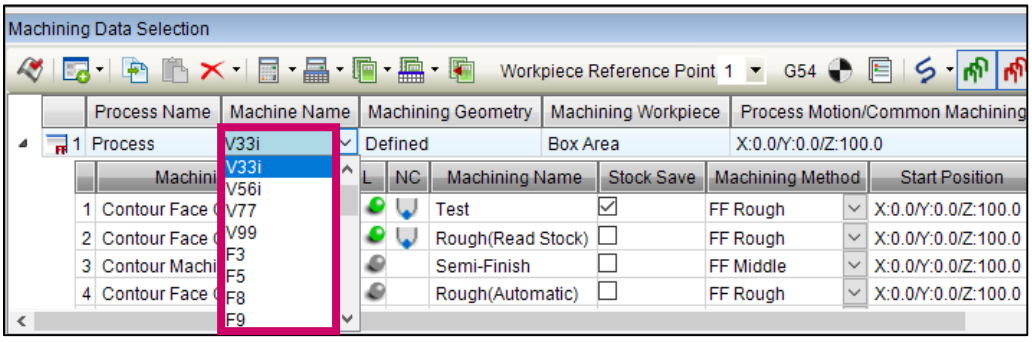


(1) Parameter name - MACHINE tree

The following models have been added.
iQ500, V100S, v61, a71nx, a92, a120nx

The addition of the models are also reflected in the model name selection of the process data.

Machining Data Selection screen



(2) High accuracy time prediction - Machine Parameters file

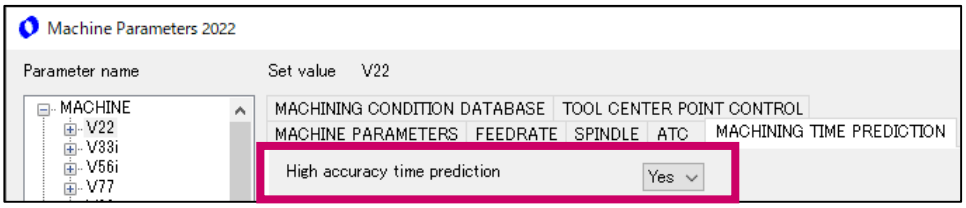
The following models have been added.
a40, a500Z, D200Z, DA300, iQ500, V80S, V90S, V100S, D800Z, v61, a92, a71nx, a120nx, N2-5XA

■ Note

- The following models have been deleted from "Parameter name - MACHINE tree".
  MCC1513, MCC2013
  However, if you have used the Data Migration Tool to migrate the machine parameter files of FFCAM2021 or earlier, the machine parameter files of MCC1513 and MCC2013 will also be restored.

- For the following models, the default value of [High accuracy time prediction] has been changed to [Yes].

  V22, V33i, V56i, V77, V99, iQ300, iQ500, v61, N2, a40, a51nx, a61nx, a71nx, a81nx, a92, a120nx, a500Z, N2-5XA, V22-5XB, V33i-5XB, D300, DA300, D500, D200Z, D800Z, V80S, V90S, V100S



7. Added a Macro to Acquire the Stock Min. Detect Width

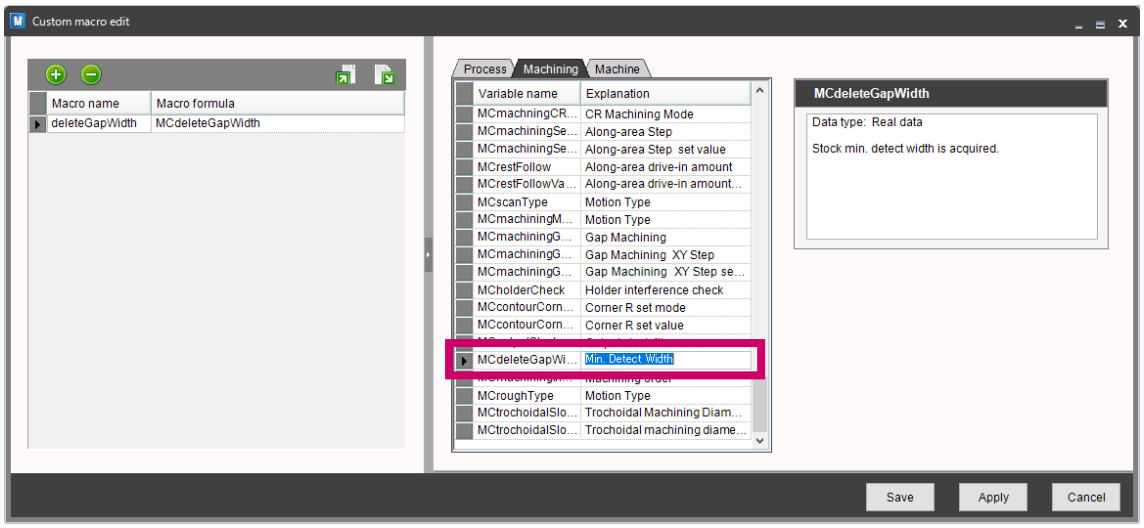
A macro to acquire the stock Min. Detect Width for the pre-machining information has been added to [Custom macro edit].

The following macro has been added.

Tab	Variable name	Explanation	Remarks
Machining	MCdeleteGapWidth	Min. Detect Width	Data type: Real data Stock min. detect width is acquired.

■ Setting Screen

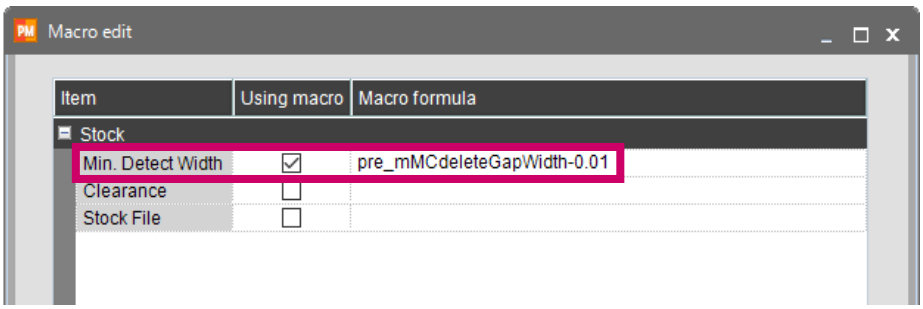
Custom macro edit screen



Macro edit screen

Example: Set the Min. Detect Width of the Stock to the value obtained by subtracting "0.01" from the stock Min. Detect Width of pre-machining.

"pre_mMCdeleteGapWidth-0.01"



8. Improvement to Enable Checking the Machining Time in the List of the Machining Data Selection Screen

Now the Machining Time can be checked from the list of the Machining Data Selection screen.

Users had to check the Machining Time in the output information file in the previous FFCAM versions.

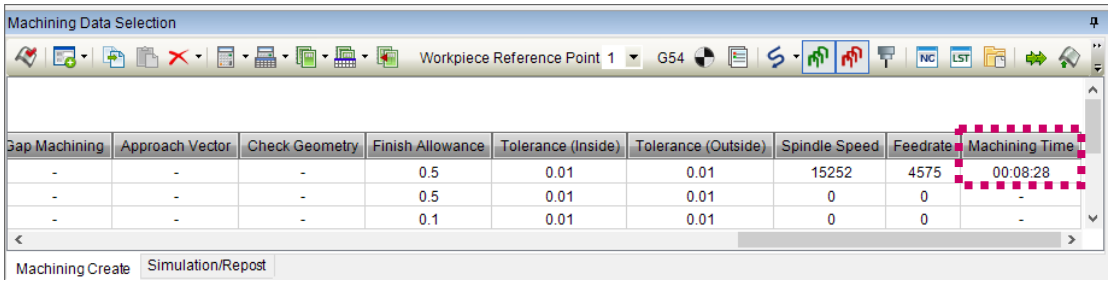
The Machining Time can now be easily checked on the screen in FFCAM 2022.

■ Explanation of Screen

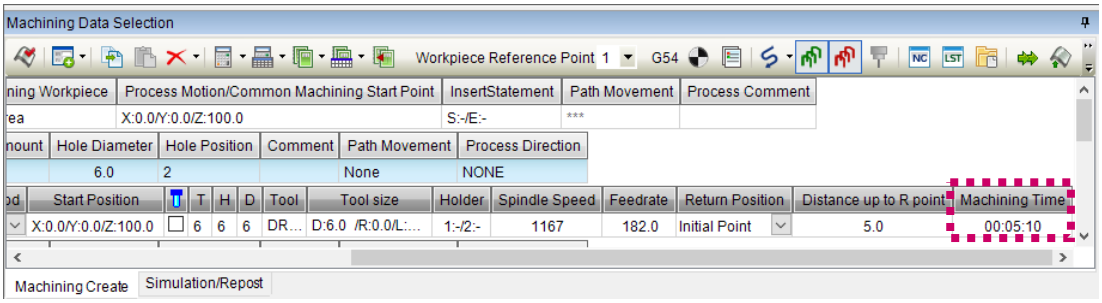
A column has been added to display the Machining Time (hh:mm:ss) in the list of the Machining Data Selection screen.

Machining Data Selection screen

3D machining data



Drilling data



■ Note

The Machining Time is displayed after path calculation is completed successfully.

9. Added Options to Show/Hide All CL Paths in the Right-click Menu of the Machining Data Selection Screen

Options have been added to the right-click menu of the Machining Data Selection screen to show or hide all CL paths for each process or machining.

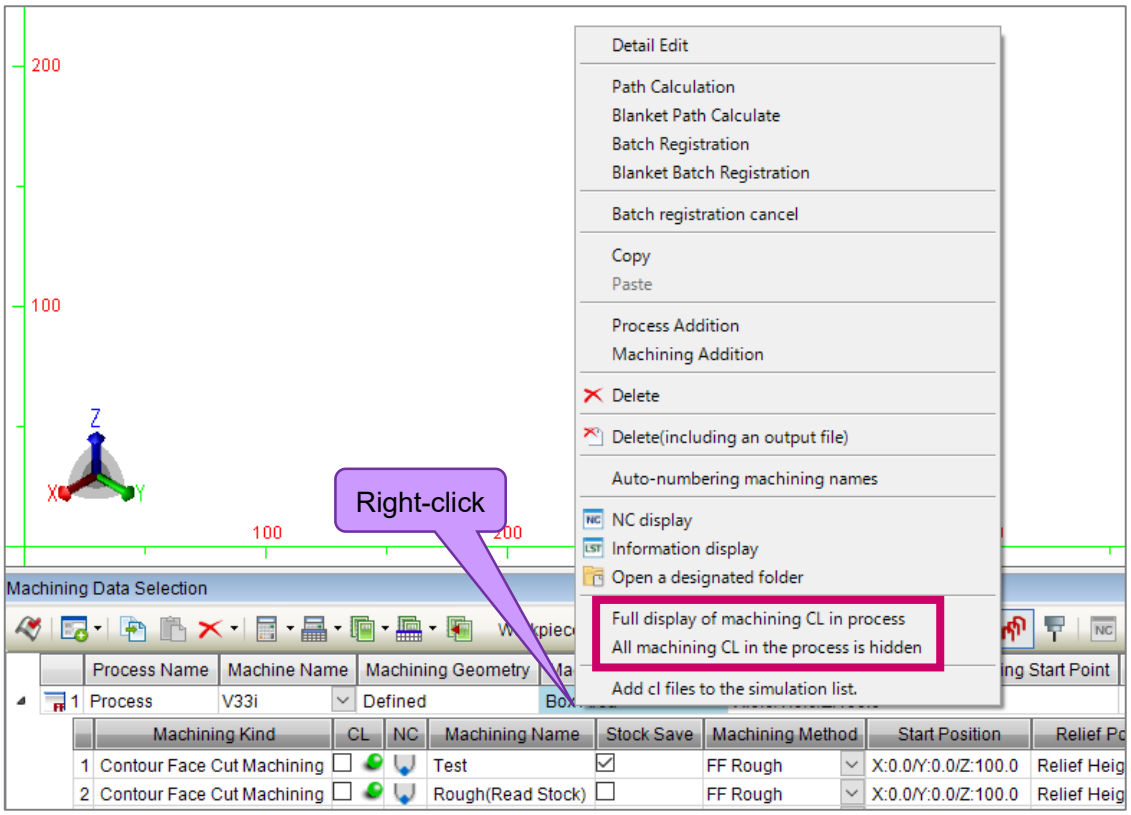
An option was available to hide all CL paths in previous FFCAM versions, but an option to show or hide CL paths by process or machining was not available.

CL paths can be shown or hidden by process or by machining in FFCAM 2022.

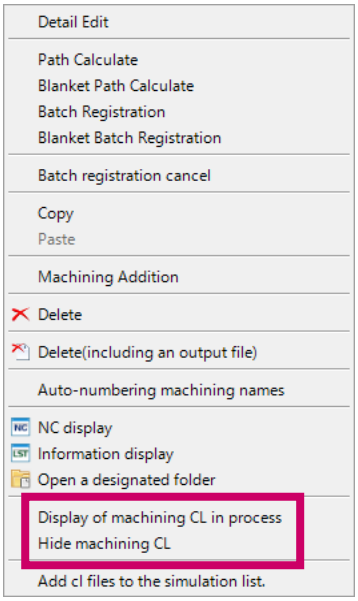
■ Operation Screen

Options "Full display of machining CL in process/All machining CL in the process is hidden " and "Display of machining CL in process/Hide machining CL" have been added to the right-click menu of the process or machining list in the Machining Data Selection screen.

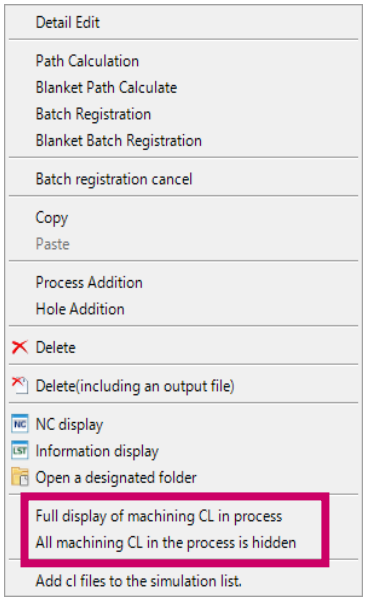
Screen Example: Right-click menu of the 3D machining/Process list



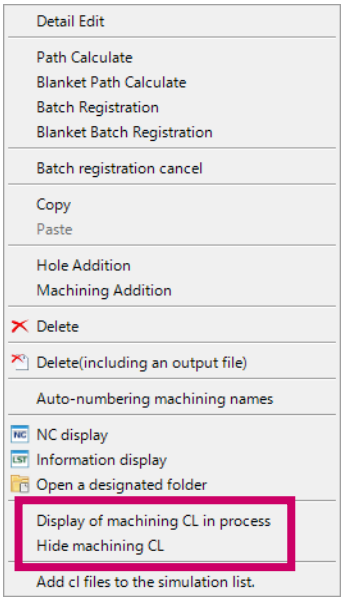
Right-click menu of the 3D machining/Machining list



Right-click menu of the Hole Process list



Right-click menu of the Drilling list



Full display of machining CL in process/Display of machining CL in process

Displays all CL paths in the selected process or machining.

All machining CL in the process is hidden /Hide machining CL

Hides all CL paths in the selected process or machining.

10. Improved the Display of the Confirmation Dialog when Starting Path Calculation

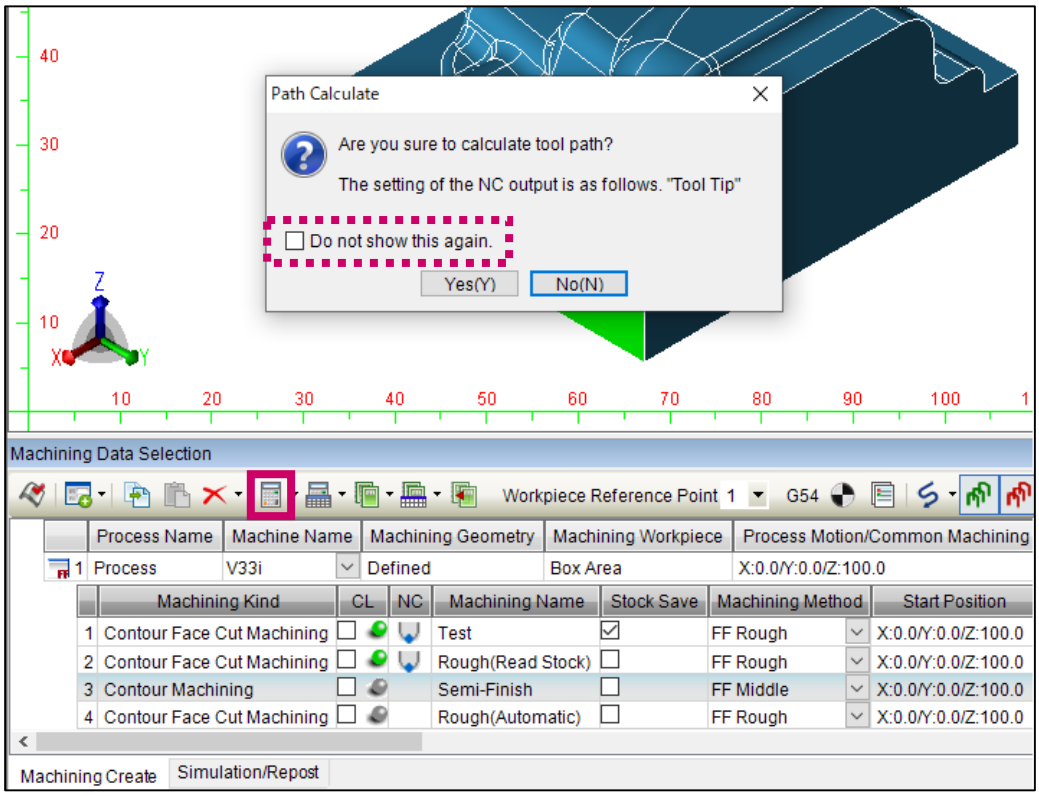
A function has been added to set whether to display a confirmation dialog when the [Path Calculation] button is clicked to start the path calculation.

Use this function to avoid the display of the confirmation dialog that delays the operation when a path calculation is started.

■ Setting Screen

Confirmation Dialog

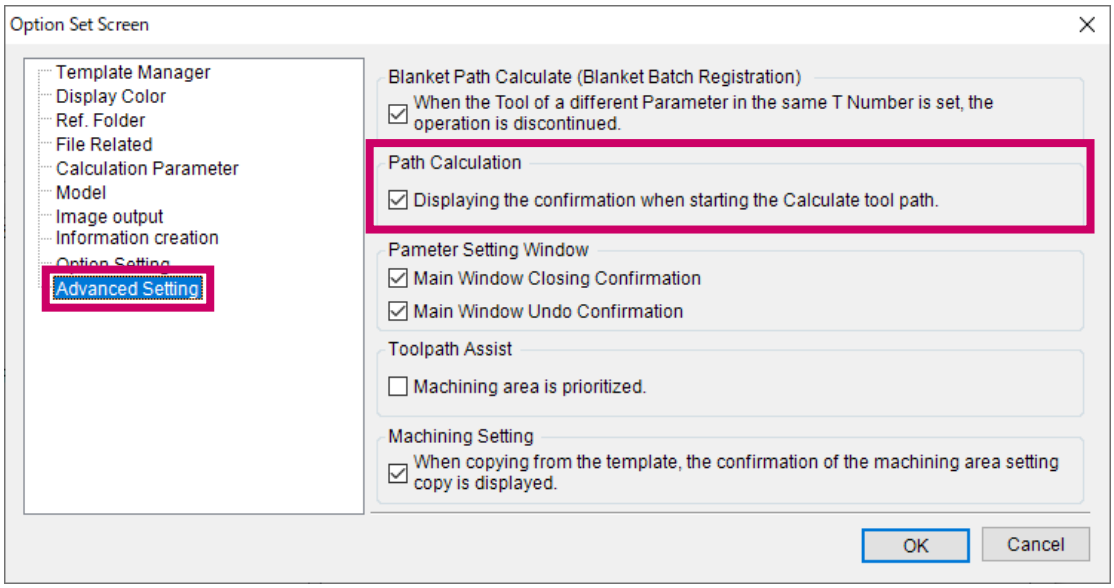
A check box that allow users to select "Do not show this again." has been added to the confirmation dialog that is displayed when the [Path Calculation] button is clicked.



If you select the "Do not show this again." check box and select [Yes] to perform the path calculation, the confirmation dialog is not displayed from the next time onwards.

Option Set Screen

In the [Advanced Setting] window of the [Option Set Screen], users can set in advance whether to display the confirmation dialog.



If the option is set by removing the check from the "Displaying the confirmation when starting the Calculate tool path" check box, the confirmation dialog is not displayed from the next time onwards.

* By default, the check box is selected.

11. Improved the Display of the Confirmation Dialog when Copying Machining Data with the Machining Area Set

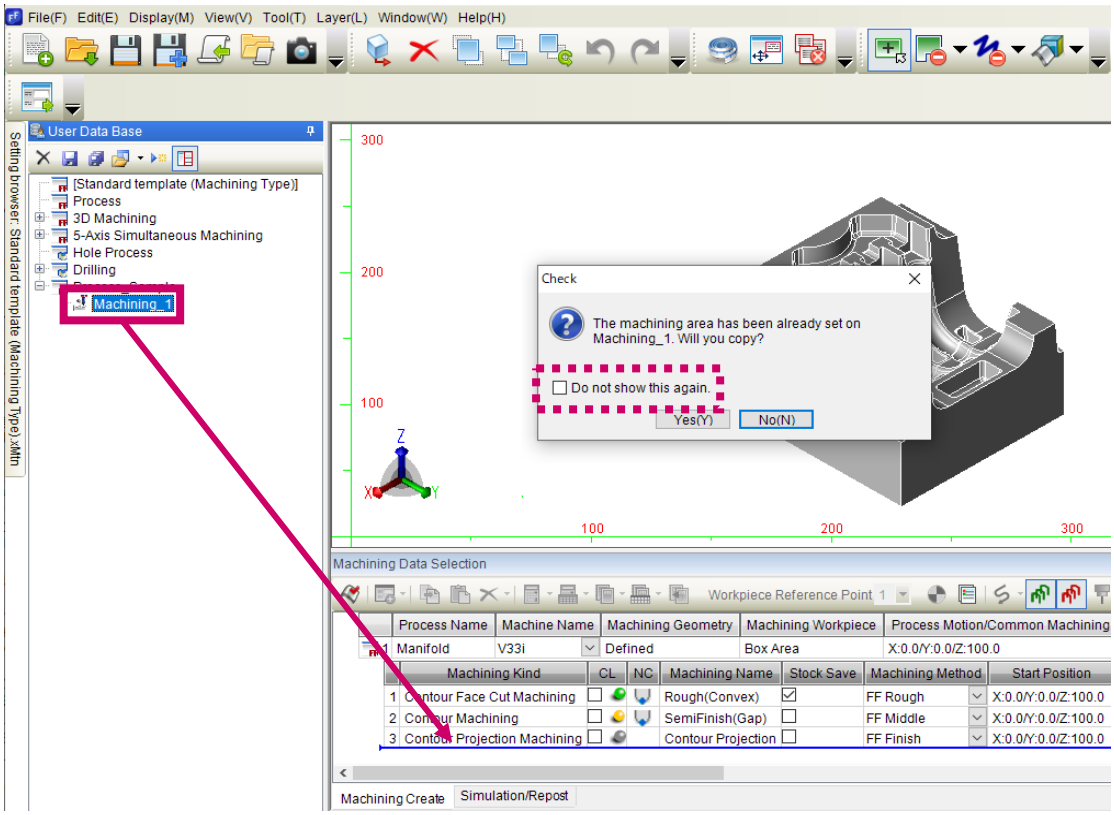
A function has been added that can be used to set whether to display a confirmation dialog when copying the machining data, for which the machining area is set, to the [Machining Data Selection] window from the template.

Use this function to avoid the display of multiple confirmation dialogs that delays the operation when machining data with machining area already set is copied several times.

■ Setting Screen

Confirmation Dialog

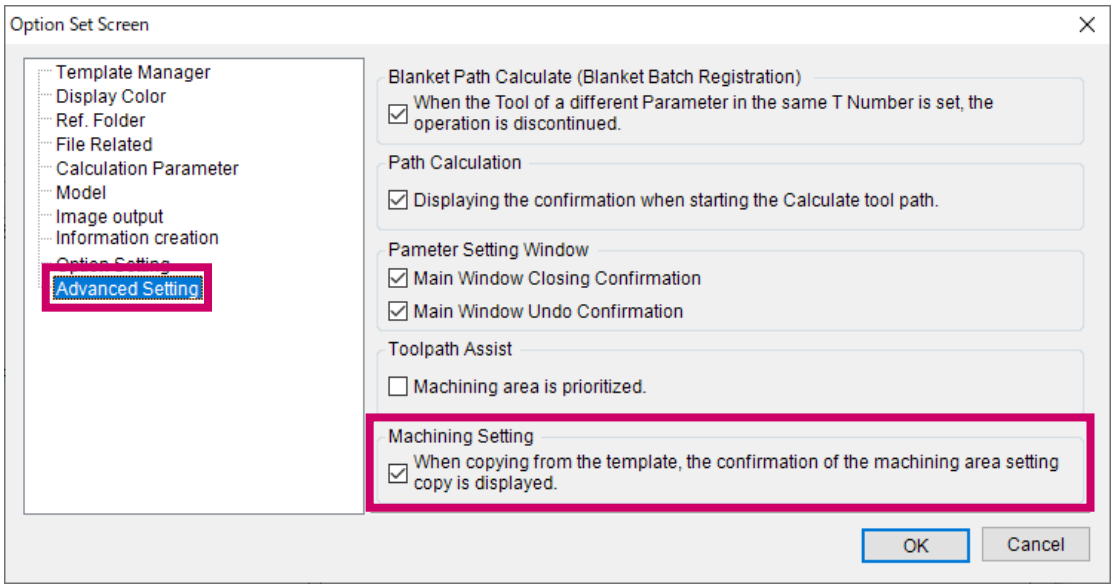
A check box allowing the user to select "Do not show this again." has been added to the confirmation dialog, which is displayed when machining data with a machining area already set is copied from a template to the Machining Data Set window.



If you select the "Do not show this again." check box and select [Yes] to perform the copy operation, the confirmation dialog is not displayed from the next time onwards.

Option Set Screen

In the [Advanced Setting] window of the [Option Set Screen], users can set in advance whether to display the confirmation dialog.



If the option is set by removing the check from the "When copying from the template, the confirmation of the machining area setting copy is displayed." check box, the confirmation dialog is not displayed from the next time onwards.

* By default, the check box is selected.

12. Added a Measurement Result Type to [Maximum and Minimum on Geometry] of Measurement

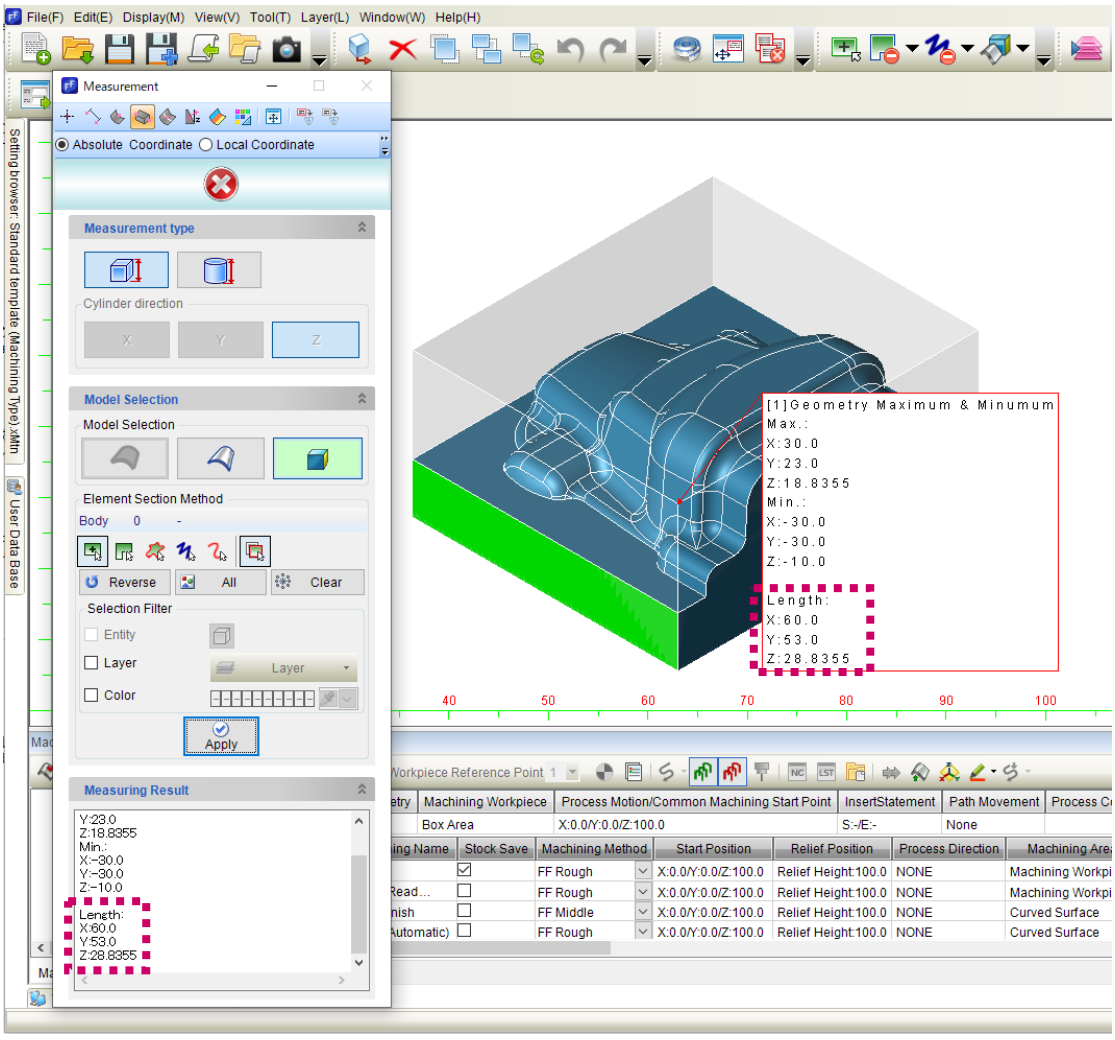
A function has been added to display "Length" in the measurement results of [Maximum and Minimum on Geometry] (Measurement type: Box) of [Measurement].

After measurement, the length of the X, Y, and Z sides are displayed along with the maximum and minimum values of X, Y, and Z of the box that used to be displayed in previous versions of FFCAM.

■ Operation Screen

Lengths of the X, Y, and Z sides of the box are displayed after measuring with [Maximum and Minimum on Geometry] (Measurement type: Box).

Measurement [Maximum and Minimum on Geometry] screen



13. Added a Function to set RGB Color with 1/256 Code to the Color Filter of Element Selection Screen

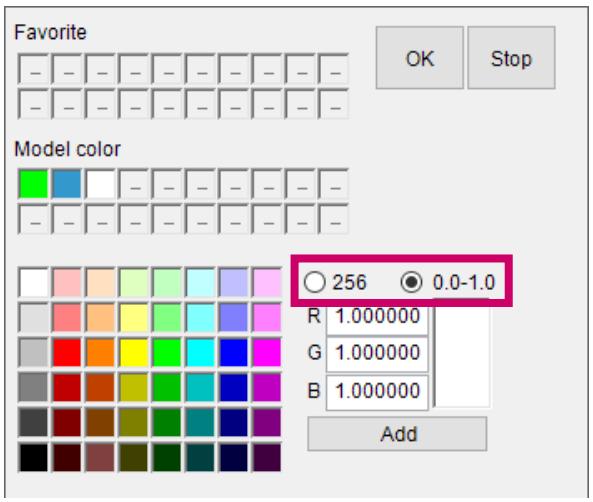
A function to specify the color of the color palette using RGB colors with 1/256 code has been added to the color filter of the element selection screen.

In addition to the previous method of specifying colors with 256 gray levels, it is now possible to specify colors in 1/256 code.

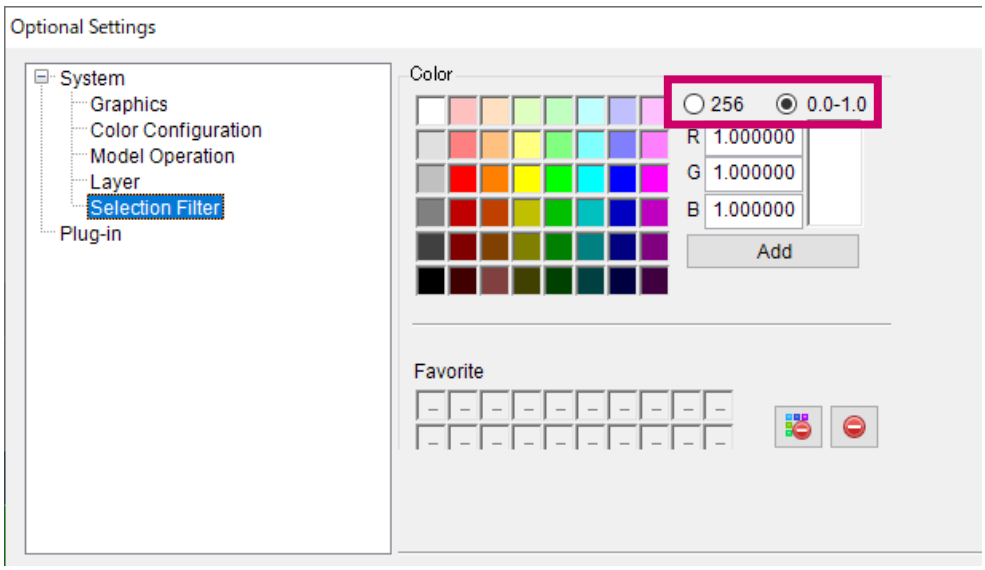
■ Setting Screen

Radio buttons to select "256 gray levels" or "1/256 code" have been added to the RGB color input field of the color palette on the element selection screen.

Color palette of [Color] Set on the element selection screen



Option Settings [Selection Filter] window



256 (default value)

Enter the RGB color setting values with 256 gray levels as before.
Enter an integer value between 0 and 255.

0.0-1.0

Enter the RGB color setting values with 1/256 code.
Enter a real number between 0.0000000 and 1.0000000 (up to 7 decimal places).

14. Improved Work Origin Setting Function on Repost - Information Screen

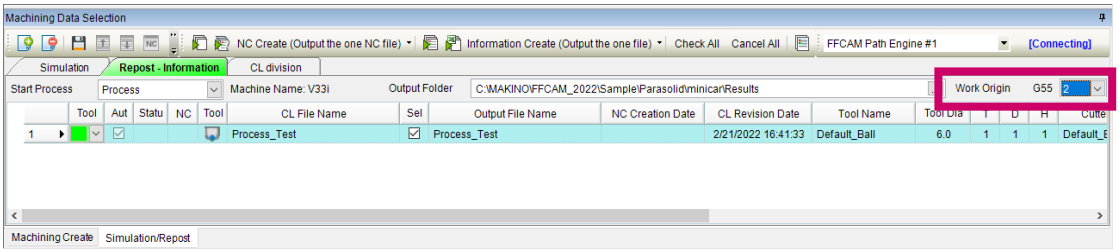
In the previous versions of FFCAM, after setting the work origin on the Repost - Information screen, the work origin was reset when switching to the Machining Create screen and then back to the Repost - Information screen.

In FFCAM 2022, this function has been improved so that the work origin which is set on the Repost - Information screen is retained on the Repost - Information screen even after switching to the Machining Create screen.

■ Explanation of Screen

The work origin set on the Repost - Information screen is retained on the Repost - Information screen even after switching to the Machining Create screen.

Repost - Information screen

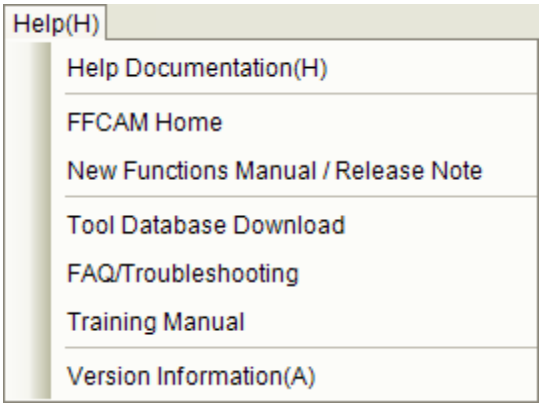


15. Enhanced Help Menu

The Help menu has been enhanced.
In addition to the previous help reference, FFCAM related documentation, FAQ, troubleshooting, tool manufacturer's database, etc. can now be accessed directly from the Help menu.

■ Operation Screen

Multiple menus have been added to the Help menu.



(1) Help Documentation

Opens the same help file as before.

(2) FFCAM Home

Opens the FFCAM website in the web browser.
* Connects to the Makino website over the Internet.

(3) New Functions Manual / Release Note

Opens a page to browse (download) the new functions manual and release notes in the web browser.
* Connects to the Makino website over the Internet.

(4) Tool Database Download

Opens a page in the web browser to browse (download) the tool manufacturer's database.
* Connects to the Makino website over the Internet.

(5) FAQ/Troubleshooting

Opens a page in the web browser to browse (download) FAQ and troubleshooting information.

* Connects to the Makino website over the Internet.

(6) Training Manual

Opens a page in the web browser to browse (download) the training manual.

* Connects to the Makino website over the Internet.

(7) Version Information

Displays the FFCAM version information as in the previous versions.

■ Note

The options for connecting to the Makino website over the Internet can be accessed when the FFCAM is launched on a PC that is connected to the Internet.

16. Added the Function to Set Random Colors for Rest Model Color and Corner R Color

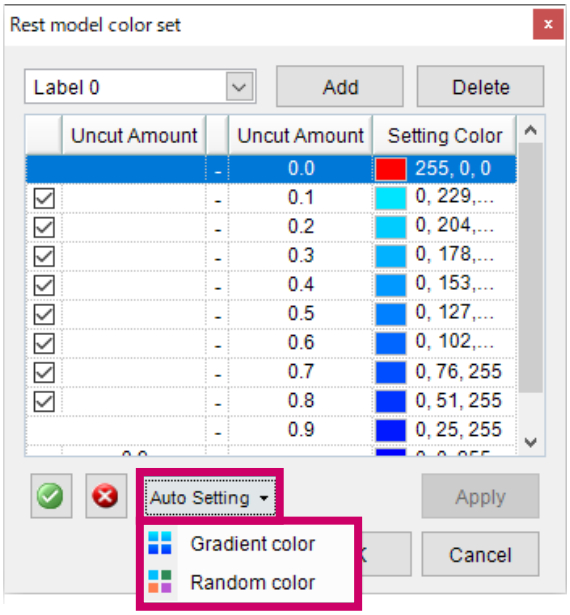
A function to set random colors automatically has been added to the color setting screen for [Rest model color set] of [Simulation] and [Corner R] of [Measurement].

Set using the pull-down menu of the [Auto Setting] button of the setting color.

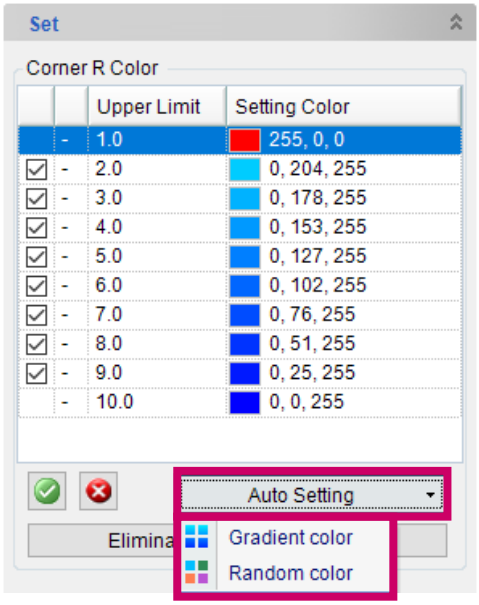
■ Setting Screen

When auto setting the setting color, select [Gradient color] or [Random color] from the pull-down menu of the [Auto Setting] button.

Rest model color set screen



Corner R Color screen



Gradient color

Sets the setting colors of lines without check marks with a gradient color (gradation).

* This is the setting method used in the previous version of FFCAM.

Random color

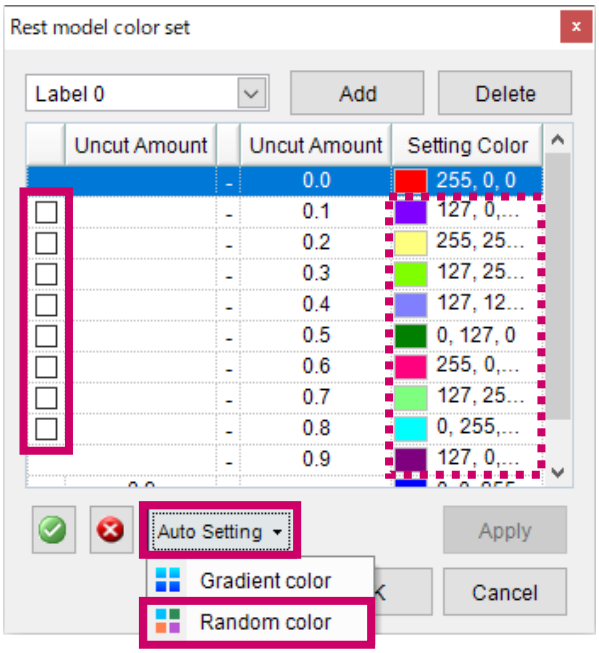
Sets the setting colors of lines without check marks with a random color.

* This is the setting method used in FFCAM 2022.

Example: Random color

Remove the check mark from the line for which you want to change the setting color, open [Auto Setting] pull-down menu, and select [Random color].

The setting colors of the lines for which the check mark has been removed are set randomly.



17. Improved Animation Playback Speed Setting Function of Simulation

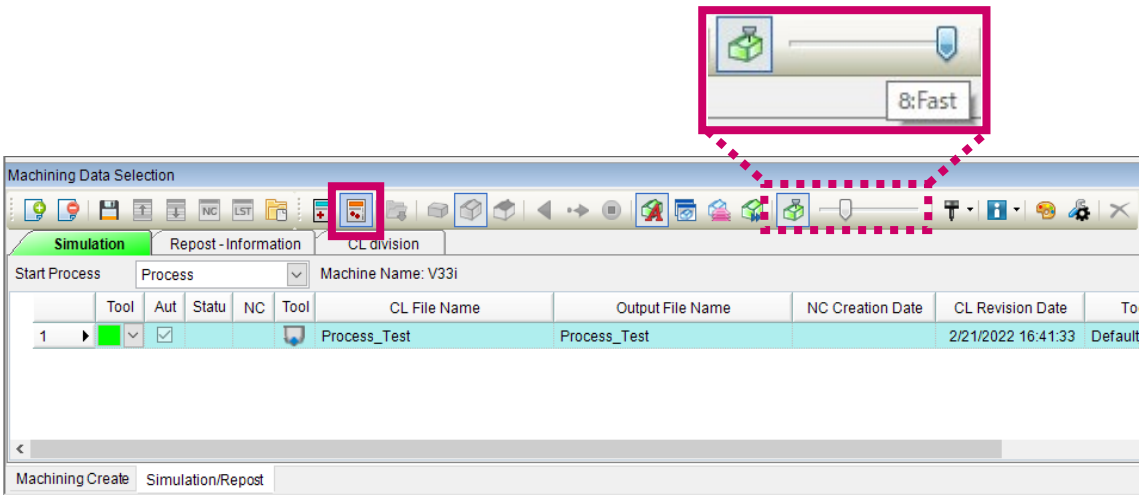
In the Extend (3-5Axis) simulation, the playback speed setting for Cutting Animation in the [Create Data (Details)] menu has been increased to 9 levels.

Previous versions of FFCAM had speed settings up to 7 levels. The animation playback speed can now be adjusted more precisely in FFCAM 2022.

■ Setting Screen

Extend (3-5Axis) Simulation screen

When executing [Create Data (Details)], use the slider bar in [Cutting Animation] to set the animation playback speed.



The slider bar allows the speed to be set in the following 9 levels:

Scale	Display speed	
0: Slow	1 second drawing per block	
1	0.1 second drawing per block	
2: Normal	Drawing per block	
3	Drawing per 20 blocks	※ Added in FFCAM 2022
4	Drawing per 50 blocks	※ Added in FFCAM 2022
5	Drawing per 100 blocks	
6	Drawing per 1000 blocks	
7	Drawing per 5000 blocks	
8: Fast	Drawing per 10000 blocks	

18. Added a Function to Copy FFCAM Work Data Automatically

The [Copy of saved data] function has been added to temporarily save a copy of the work data in case the work file is corrupted, such as when FFCAM is unintentionally terminated.

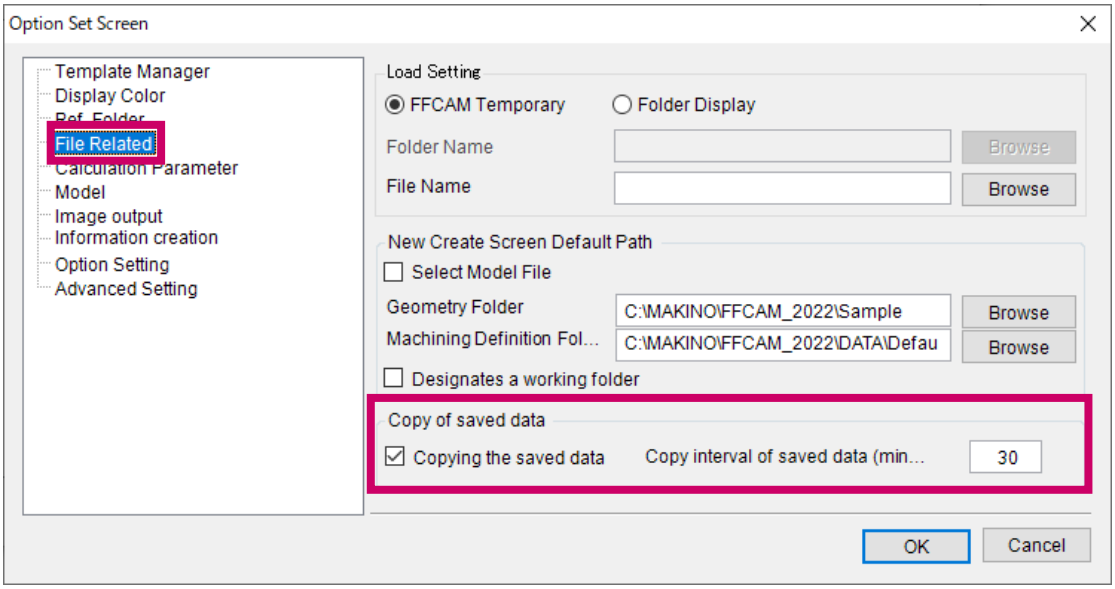
When the [Copy of saved data] function is used, a copy of the work data is saved at regular intervals when performing operations, so that the work data can be restored from the copied data in case the work data is corrupted.

You can set whether to use the [Copy of saved data] function, and the interval for automatic copy, etc.

■ Setting Screen

It is possible to set whether to use the [Copy of saved data] function, and the interval of automatic copy in [File Related] of the [Option Set Screen].

Option Set Screen



Copying the saved data

Specify whether to use the [Copy of saved data] function.
The default value is "Use" (check is ON).

Copy interval of saved data (min…

Specify the interval in minutes to copy the data automatically.
The initial value is "30 minutes". Interval between 1 and 120 minutes can be specified.

■ Notes on copied data

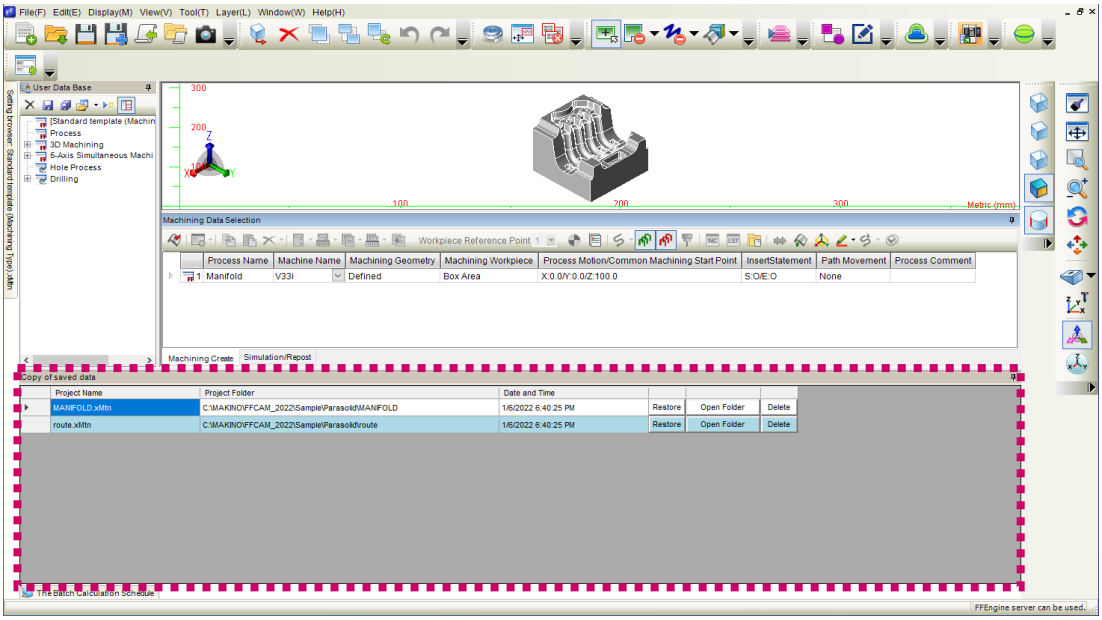
The [Copy of saved data] function automatically saves a copy of the work data at set time intervals while you are working in FFCAM.
* The data in the working state is not copied and saved.
  The last saved data is copied for each time period that is set. This function is different from a backup.

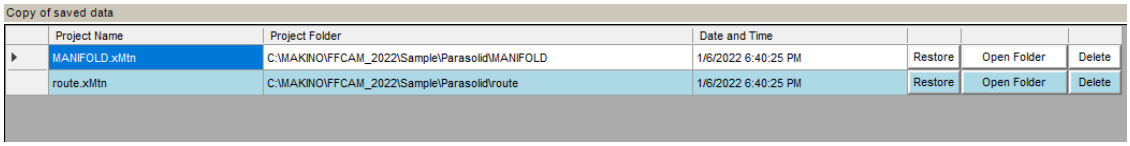
- Since the copied data is saved as a specific file separate from the work data, a restore operation (see below) is required to restore the work data.
- The copied data is saved in a specific folder (FFCAM 2022 installation folder¥Backup¥AutoBackup).
- The copied data is overwritten and saved at set time intervals, starting from the time when FFCAM is started.
  * Data copied every hour will not be retained.
- When the work screen (when closing the xMtn file) ends, the copied data is automatically deleted if the work screen ends normally.
  The copied data is retained only when the work screen is closed abnormally.

■ Restore the copied data

When FFCAM is started, the [Copy of saved data] screen is displayed on the FFCAM screen if copied data exists (that is, if FFCAM did not end normally in the previous operation and copied data has been retained).
When the work data is required to be restored, you can do so from the [Copy of saved data] window.

Copy of saved data window



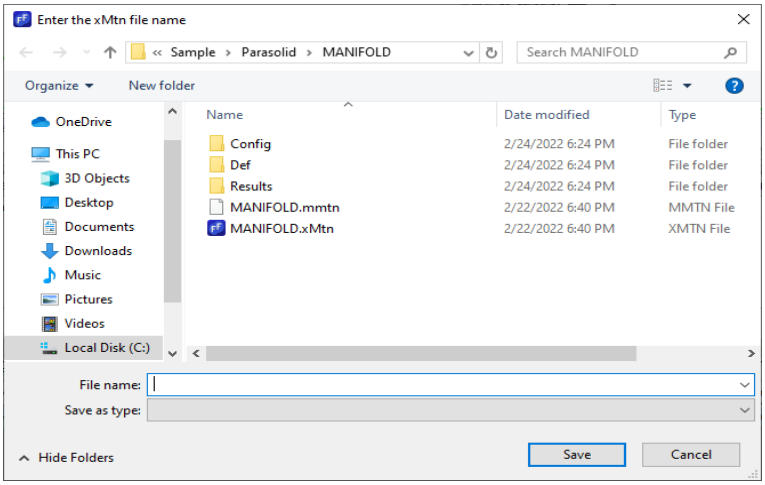


Project Name
Displays the name of the original xMtn file.

Project Folder
Displays the path to the folder where the original xMtn file is saved.

Date and Time
Displays the update date and time of the original xMtn file (the last saved date and time when the file was copied).

Restore (button)
Use this button to restore the work data.
When you click on the button, the window to specify the file name and save (restore) folder is displayed.



The target copy data is saved (restored) as work data.
You can overwrite the original xMtn file (if the original file is closed) or save the copy data with a different name to any location.
The xMtn files saved here can be used as the working files.

Open Folder (button)
Opens the folder containing the target copied data.

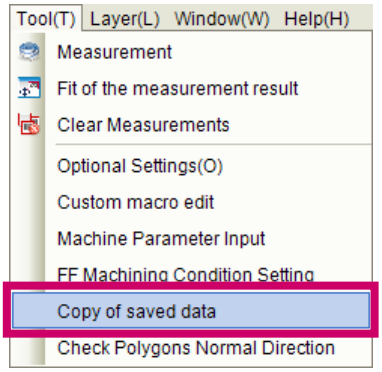
Delete (button)
Deletes the target copied data.

■ Display the [Copy of saved data] window from the menu

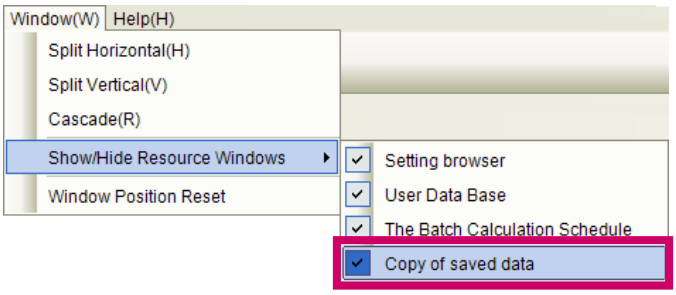
You can optionally open the [Copy of saved data] window while working in FFCAM.

From [Tool] menu or [Window] menu, select [Copy of saved data].

[Tool]



[Window] -> [Show/Hide Resource Windows]



* The [Copy of saved data] window is displayed when copied data has been saved.
  The same operations as in "Restore the copied data" (described above) can be performed in the [Copy of saved data] window that is displayed.

■ Supplementary Note

- The "xMtn file", "mmtn file", and "Config folder" are saved as copied data. If the "smtn file" exists, it is also be saved.
  Each set of files is restored during restoration.
- The work data opened in FFCAM is automatically copied.
  If multiple work data are open, all the files are duplicated and saved at the same timing (starting from the time when FFCAM is launched, at the interval set for automatic copy).
- The measurement result data is not be copied.

19. Expanded Types of Data that can be Migrated with the Data Migration Tool

In the Data migration tool of previous FFCAM, only specific data could be migrated and files such as Machining Instruction Sheet, templates, and insert statement texts could not be migrated.

In FFCAM 2022, the Data migration tool can now backup and restore files such as Machining Instruction Sheet, templates, and insert statement texts with settings by the user.

* Only applicable for files saved in the "Data" folder of the FFCAM installation folder.

* Only applicable for data that has been backed up in FFCAM 2022.

In the FFCAM 2022 setting file, the following files saved in the "Data" folder (distributed only to specific customers) are initially set to be migrated.

- Infomation.xsl
- CheckHolderName.xsl
- get*.xsl (files with the extension ".xsl" starting with get)
- Get*.xsl (files with the extension ".xsl" starting with Get)

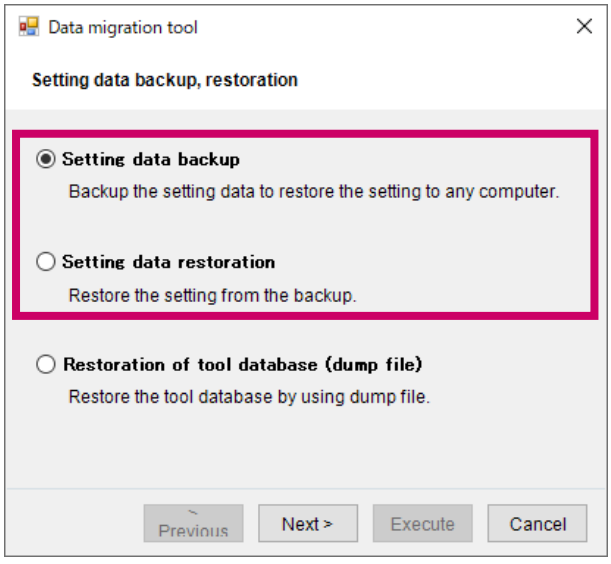
for migration of other files, the file names must be written in the setting file.

For the procedure, refer to the FAQ on the FFCAM support site.

■ Setting Screen

The [Data migration tool] also migrates the file information described in the setting file.

* The operation screen and the operation method are the same as previous FFCAM versions.



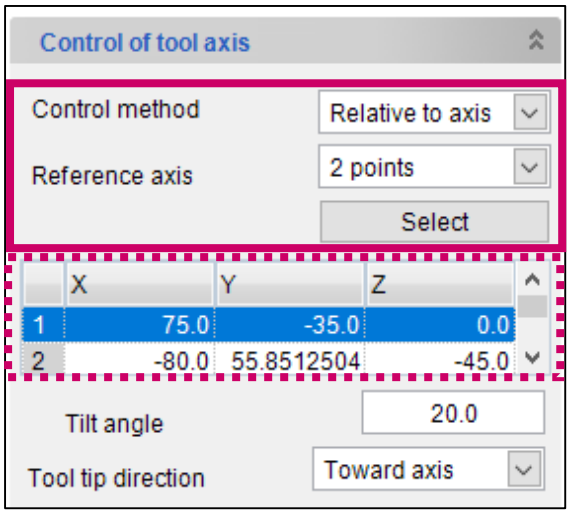
20. Improved Setting Screen of [Simultaneous 5-Axis Machining] for [2 points] Control of Tool Axis [Relative to axis]

When specifying [5-Axis Simultaneous Movement] -> [Control of tool axis] -> Control method [Relative to axis] -> Reference axis [2 points], the coordinate values of the 2 points specified by picking are now displayed.

This allows users to quickly check the coordinate values of the specified 2 points.

■ Setting Screen

Picking 2 points when Control method [Relative to axis] -> Reference axis [2 points] is specified, will display the coordinate values of the 2 points in a table format.



The X, Y, and Z coordinate values of the first point are displayed in the first line of the table, and the X, Y, and Z coordinate values of the second point are displayed in the second line of the table, allowing users to check the values.

Users can also select a cell of each coordinate value and make changes by entering the value.

When the coordinate values are changed, the vector and tool drawing in the graphics window are also updated.

21. [Machine Simulator Option] Now Supports M56

The Machine Simulator Option now supports M56 (Tool Offset Transfer Command).

■ Explanation screen

When M56 is detected by the NC process, the tool offset value is set appropriately to reproduce the behavior of M56.

This function is enabled when [Use Tool offset screen value] is specified in [Initial setting] -> [Program] -> [Tool offset amount].