PartMaker 2013

What's New

Important User Notices

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Patents

PartMaker software is subject to the following patents:

Patent granted: US 6, 112, 133 Visual system and method for generating a CNC program for machining parts with planar and curvilinear surfaces

Patent granted: US 6, 741, 905 Visual system for programming of simultaneous and synchronous machining operations on lathes

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What's New in PartMaker 2013

PartMaker 2013 contains many new features and enhancements.

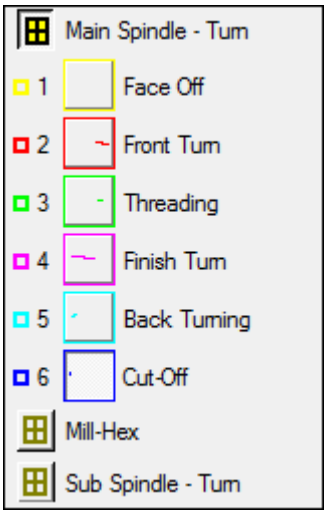
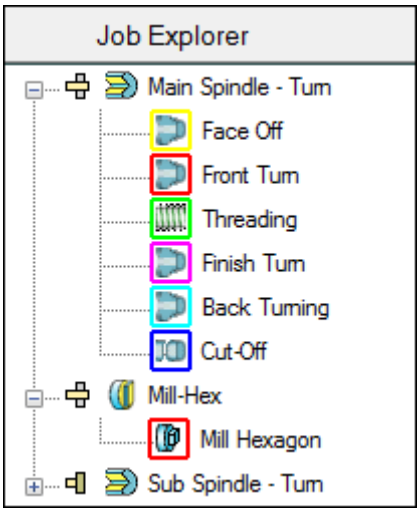
New way of working with windows and groups

PartMaker 2013 includes several enhancements that make it easier work with Face windows and groups of part features:

- New Job Explorer pane (see page 2) for finding and displaying different items, such as Face windows and groups, in a .job file.
- New way of managing the display of multiple windows within the main PartMaker window (see page 5).
- Changes to the **Main** toolbar (see page 9), so it easier to work with different types of PartMaker windows.
- Changes to the Color Palette (see page 10), so it is easier to use.

Working with the Job Explorer

PartMaker 2013 includes a new **Job Explorer** pane on the left-hand side of the main PartMaker window, which makes it easier to work with different items in a .job file. For example:

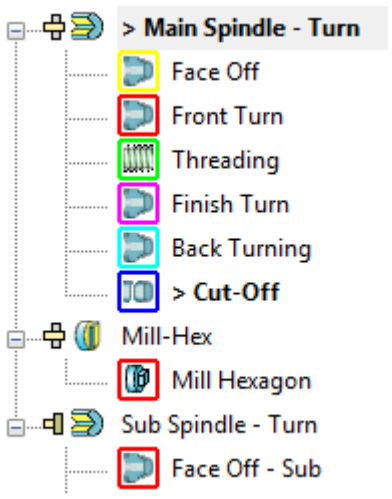
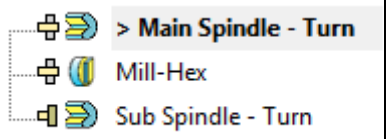
Old-style navigation pane	Job Explorer pane in 2013
	

*The **View > Display Windows Icons** menu option is no longer available, as the Job Explorer pane always displays icons for all the Face windows in the .job file.*

Using the Job Explorer pane

The Job Explorer pane lists the Face windows in the current .job file.

When using a Face window in CAM mode, you can also view the groups of part features that have been programmed in each Face window. For example:

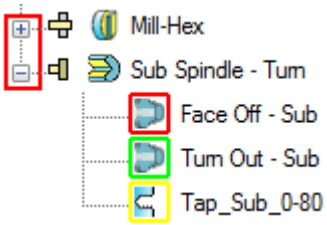
CAM Mode	CAD Mode
	

Expanding and collapsing items

You can control how much information is displayed in the Job Explorer pane by expanding and collapsing items:

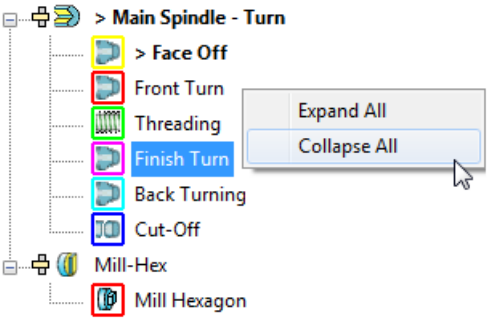
- Click ⊞ to expand an item.
- Click ⊟ to collapse an item.

For example:



You can also double-click an item to expand or collapse it.

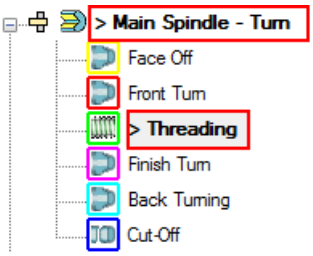
To expand or collapse all items, right-click in a blank area of the Job Explorer pane and select **Expand All** or **Collapse All** from the menu:



*To display the group number, as well as the group name, in the Job Explorer pane, select the **Display Group Numbers** option on the **Preferences** dialog.*

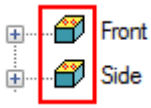
Identifying the currently selected items

The currently selected items in the Job Explorer pane are displayed in the main PartMaker windows. These items are preceded by the **>** symbol and shown in bold. For example:



Machining function icons

The icon next to each Face window denotes the type of machining function programmed in the Face window. For example, in PartMaker/Mill an **XY Plane** using Box stock is shown as:

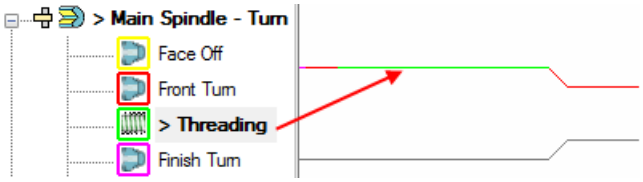


Spindle icons

In PartMaker/SwissCAM and PartMaker/Turn-Mill only, an additional icon denotes whether programming in the Face window is on the main spindle or the sub-spindle. For example:

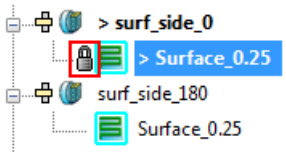
Group icons

The icon next to a group denotes the type of machining strategy used for that group and the colored border denotes the color used for its profile in the Face window. For example:



Double-clicking a group icon displays the dialog containing the settings for that group, such as the **Profile Group Parameters** dialog, the **Hole Group Parameters** dialog or the **Surface Group Parameters** dialog.

When using surface machining in PartMaker/SwissCAM, PartMaker/Turn-Mill or PartMaker/Mill, an additional lock icon denotes when the group's toolpath is locked. For example:

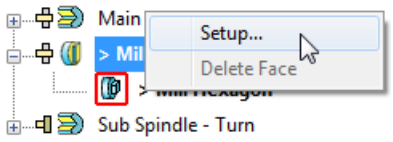


*To lock or unlock a toolpath, use the **Lock Toolpath** option on the **Surface Group Parameters** dialog.*

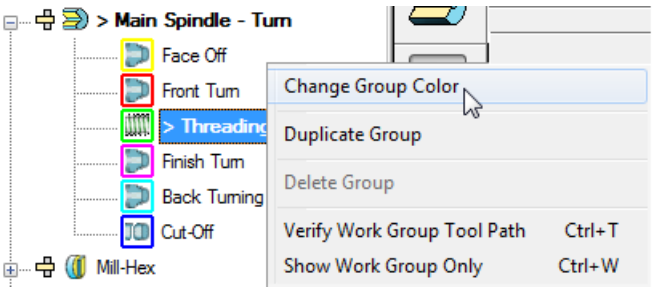
Menu options

Right-click an item (or its icon) in the Job Explorer pane to display a list of menu options relevant to that item. For example:

- For a Face window:



- For a group:



Selecting the **Change Group Color** option displays the **Color** dialog, where you can select a new color for the group. PartMaker also uses the color you select to update the sample color in the Color Palette.

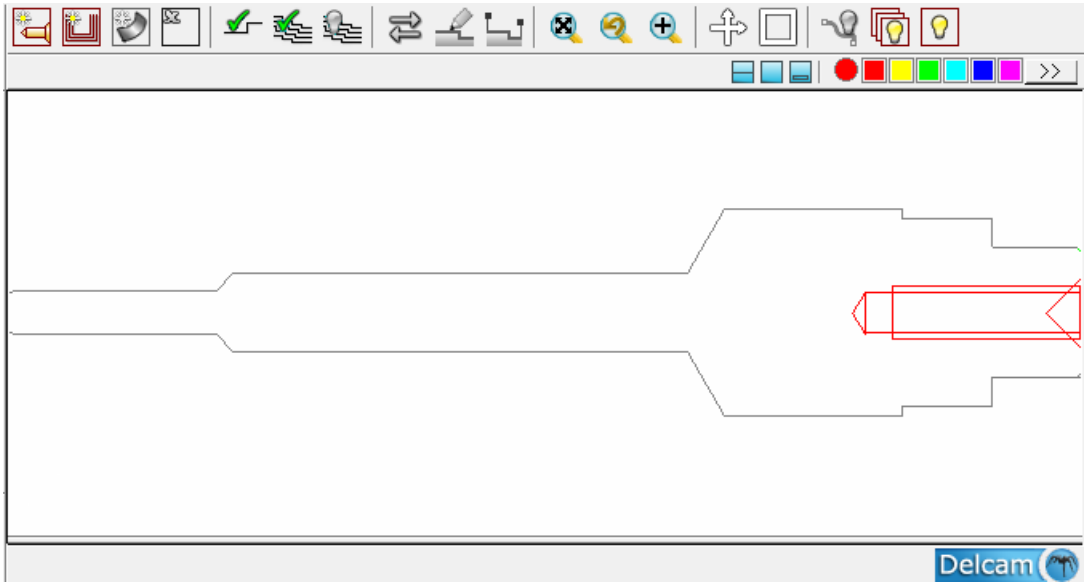
Managing the display of windows

PartMaker 2013 has a new way of managing the display of Face windows. You can now choose to work with:

- Fixed Face windows (see page 6); or
- Floating Face windows (see page 8).

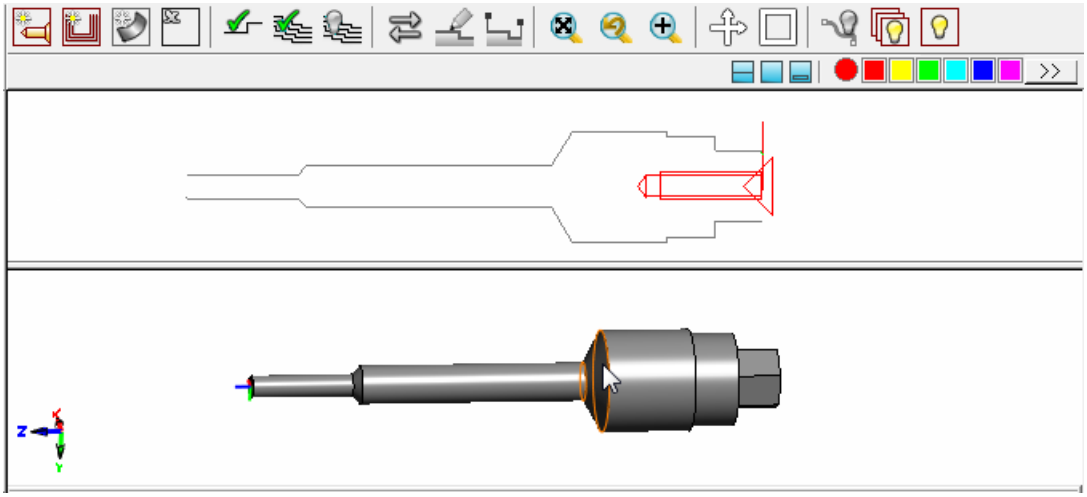
Using Fixed Face windows

When using fixed Face windows, PartMaker displays a single Face window for the currently selected Face in the Job Explorer pane. The window has no title bar and expands to fill the main PartMaker window to provide a larger working area. For example:



Working with a Solids window

If you are using a Solids window, it is embedded into the current Face window. For example:

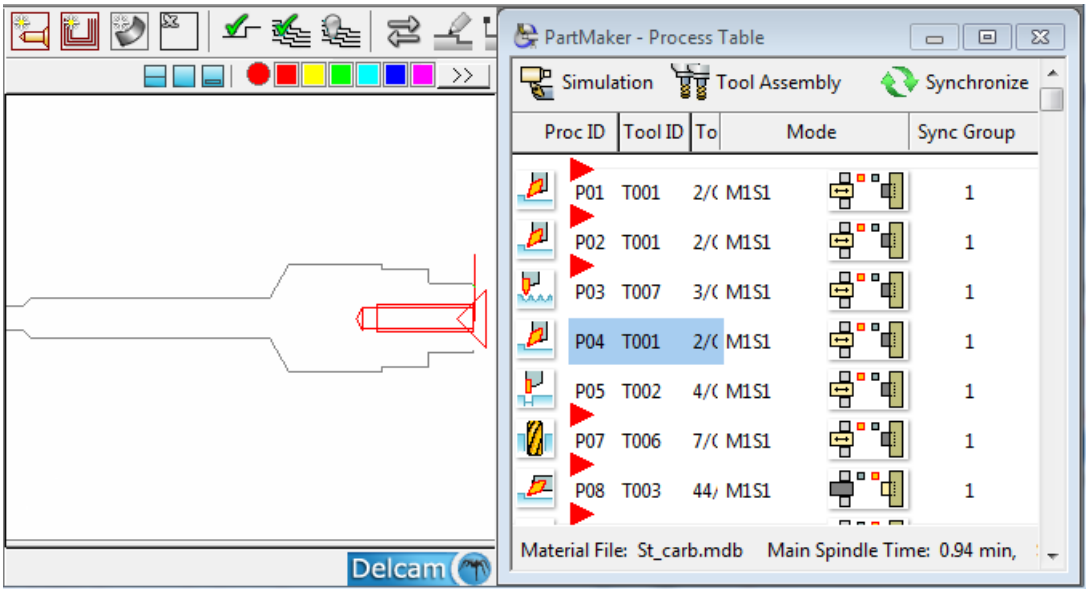


This works in a similar way to the overlapping windows in previous versions of PartMaker.

*The **View > Overlapping Windows** menu option is no longer applicable and has been removed from PartMaker 2013.*

Arranging windows

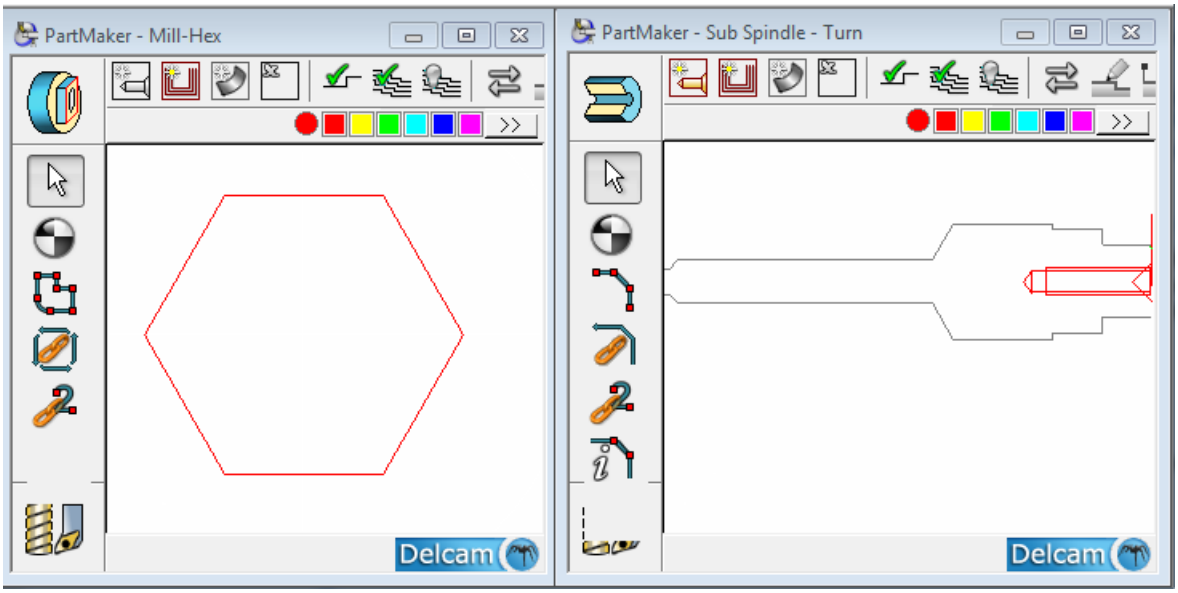
When working with Fixed Face windows, selecting **Window > Arrange Windows** automatically sizes and positions all open windows (including the Process Table and Simulation windows, if open), so they are visible in the main PartMaker window. For example:



If you close any open windows, such as the Process Table and Simulation window, the fixed Face window remains at its reduced size. To re-size it so that it fills the available space, use the **Maximize Face Window** button at the end of the **Main** toolbar:

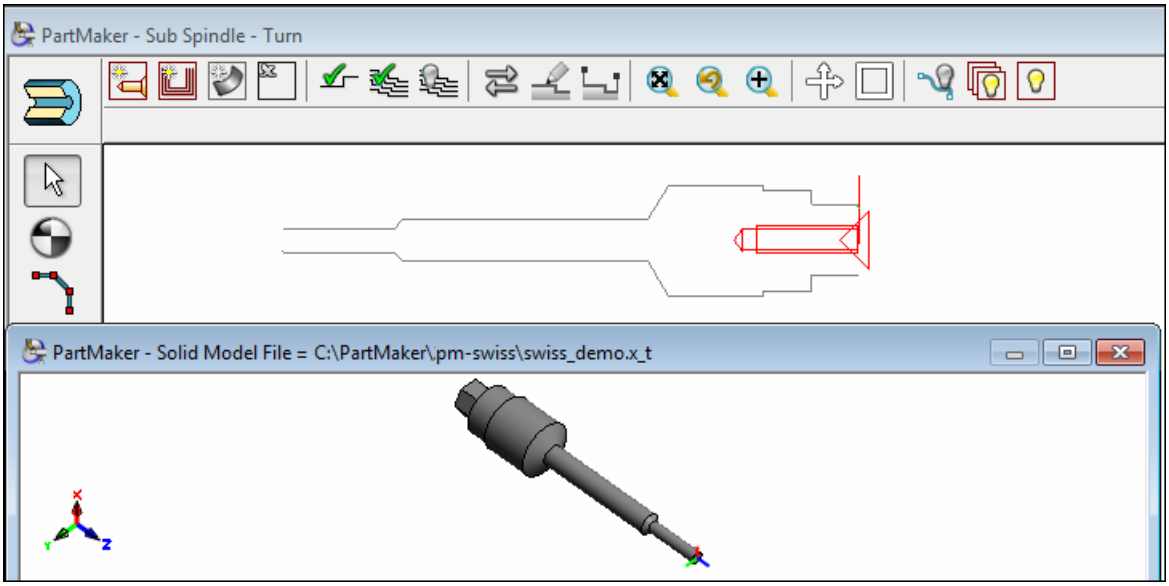
Using Floating Face windows

When using floating Face windows, PartMaker displays multiple Face windows in the main PartMaker window. As you select a Face window from the Job Explorer pane, PartMaker displays it in its own window. Each window has a title bar and can be sized and positioned independently. For example:



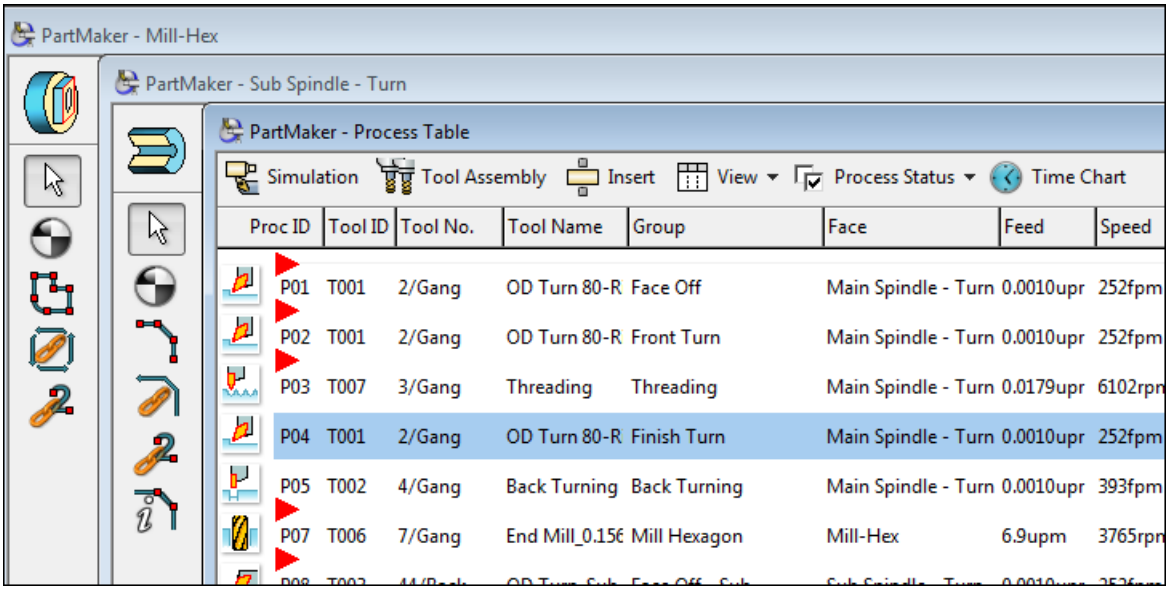
Working with a Solids window

If you are using a Solids window, it is displayed as a separate window. For example:



Arranging windows

When working with floating Face windows, selecting **Window > Arrange Windows** cascades all open windows, including the Process Table and Simulation windows. For example:



Changes to the Main toolbar

PartMaker 2013 includes the following changes to the Main toolbar:

Button	Description
	A new toolbar button for displaying a Face window. Click this button to display the currently selected Face window on top of all other open windows.
	An updated icon is used for the **Show Process Table** button. Click this button to display the Process Table window on top of any other open windows.
	A new toolbar button for displaying the **Simulation** window. Click this button to display the Simulation window on top of any other open windows. *The image displayed on the button varies depending on the PartMaker application you are using.*
	An updated icon is used for the **Arrange Windows** button. Click this button to automatically resize and/or position any open windows.

Redesigned Color Palette

The Color Palette has been redesigned so the currently selected (sample) color is displayed in a circle. This makes it easier to distinguish it from the colors that are available for selection:

Previously, the **>>** button (for displaying the **Color** dialog) was displayed on the Color Palette in CAM mode only if you selected the **Extended Color Palette in CAM Mode** setting on the **Preferences** dialog. To be consistent with the new method of changing a group's color from the Job Explorer pane (see page 2), where the **Color** dialog is displayed for selecting a new color, PartMaker 2013 always displays the extended Color Palette in CAM mode. Therefore, the **Extended Color Palette in CAM Mode** option has been removed from the **Preferences** dialog.

Using the Process Table

The design and layout of the Process Table has been updated in PartMaker 2013 to make it easier to use.

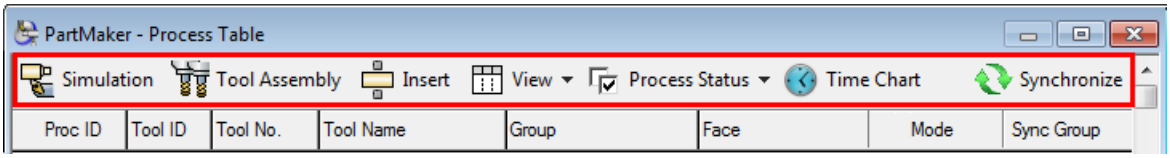
In particular, you can now quickly:

- Access common tasks from a new **Process Table** toolbar (see page 10).
- Locate the group in which a process has been programmed and view its details. (see page 12).

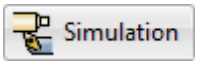
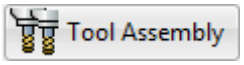
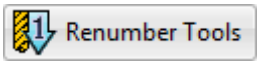
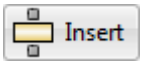
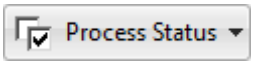
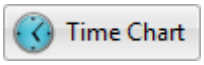
Using the Process Table toolbar

A new **Process Table** toolbar contains buttons for the common tasks you perform when working with the Process Table.

The buttons available vary depending on the PartMaker application you are using. The following example shows the **Process Table** toolbar in PartMaker/SwissCAM:



The following buttons may be available in the toolbar.

Button	Description
	Displays the Simulation window, where you can visualize the part being machined and identify any errors before machining.
	Displays the **Tool Assembly** dialog, which lists all the tools used by the processes in the Process Table. Available only in PartMaker/SwissCAM, PartMaker/Turn-Mill and PartMaker/Mill.
	Renumbers the tool numbers (as displayed in the **Tool No**. column) to reflect the order in which the tools are used in the Process Table. Available only in PartMaker/Mill and PartMaker/Turn.
	Displays the **Material Control Process Parameters** dialog for inserting a material control process into the Process Table. Available only in PartMaker/SwissCAM, PartMaker/Turn-Mill and PartMaker/Turn.
	Click ▼ to display options for controling the display of columns: **Full View** — Select to display equally spaced columns using all the available space. **Default View**— Select to position the columns in their default positions.
	Click ▼ to display options for the **Status** column in the Process Table. When the **Status** option is selected for a process, PartMaker includes the process in simulation and postprocessing. **Show Process Status/Hide Process Status** — Select to show or hide the **Status** column in the Process Table. **Enable All Processes** — Select to enable the **Status** option for all processes. **Disable All Processes** — Select to disable the **Status** option for all processes.
	Displays a graphical representation, known as a Time Chart, of how processes in the Process Table are synchronized. Available only in PartMaker/SwissCAM and PartMaker/Turn-Mill.

Button	Description
Synchronize	Groups consecutive processes that are machined using the same Synchronization Mode into Synchronization Groups. For Swiss machining, you can use Synchronization Groups to machine two or more processes simultaneously on different tool posts and/or different spindles. Available only in PartMaker/SwissCAM and PartMaker/Turn-Mill.

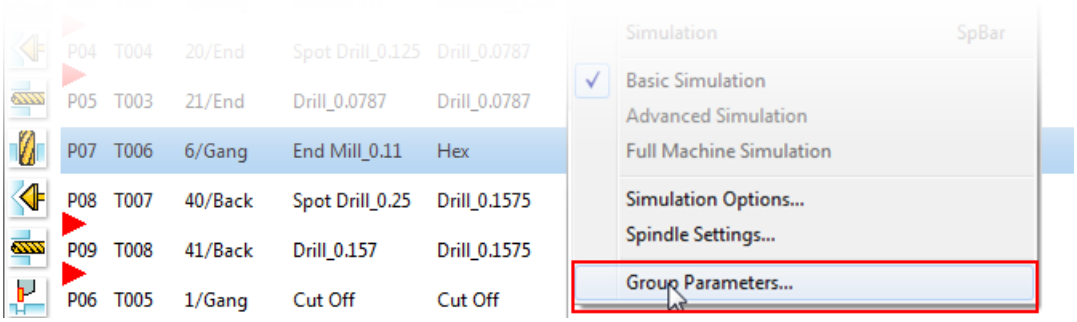
Viewing group details from the Process Table

In PartMaker 2013 you can now locate the group used to program a process from within the Process Table.

Previously, it could be time consuming to locate the Face window and group in which a process had been programmed, particularly if the .job file contained faces or groups with similar names.

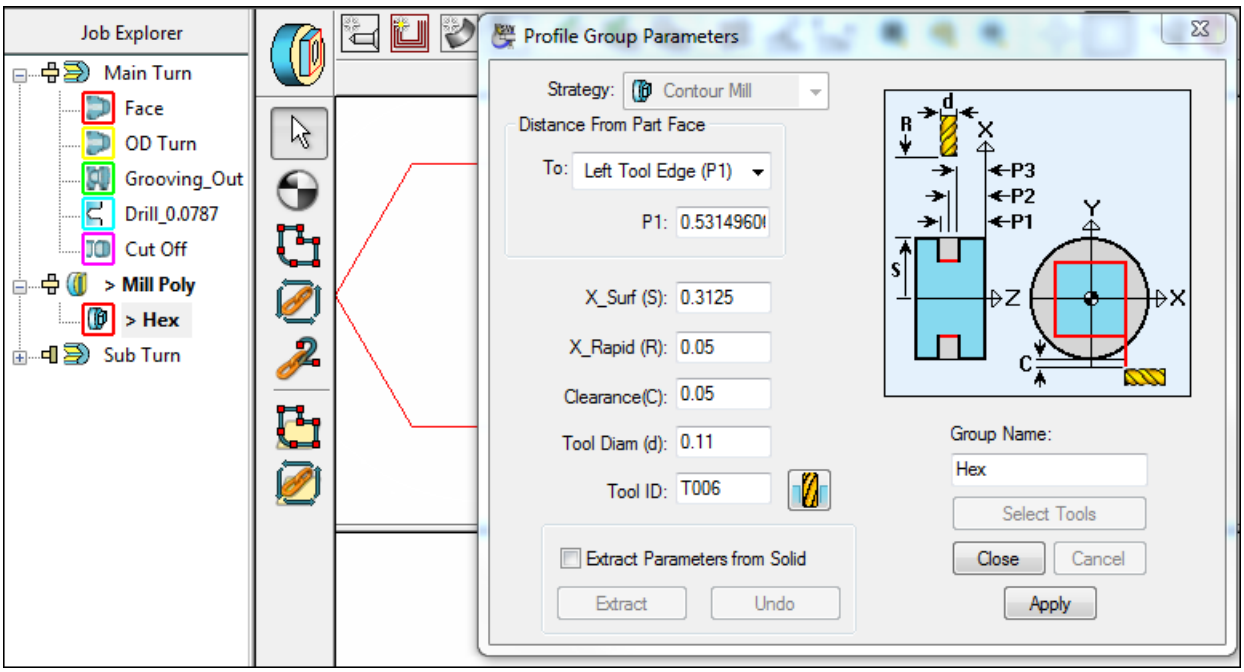
To locate the group used to program a process in the Process Table:

1 Click to select the process in the Process Table.



2 Right-click and select **Group Parameters** from the menu.

PartMaker closes the Process Table, opens the Face window containing the group and selects the group in the Job Explorer pane:



Advanced Surface Machining

A new Advanced Surface Machining (ASM) module is available for PartMaker/SwissCAM, PartMaker/Turn-Mill and PartMaker/Mill.

To use the ASM module, you must purchase the Advanced Surface Machining (ASM) cost option. All customers with a Surface Machining Wizard (SWM) license, who have a current maintenance agreement prior to the release of PartMaker 2013, will be eligible to upgrade to ASM free of cost.

The ASM module ensures the accurate machining of complex shapes and includes a comprehensive set of fast and reliable milling strategies for all phases of surface milling:

- Roughing;
- Finishing;
- Remachining; and
- Projection.

The milling strategies support milling operations on various machining platforms, including CNC mills, Turn-Mill centers, bar-fed mills and Swiss-type lathes.

Moving from SMW to ASM

The Advanced Surface Machining (ASM) is intended as a replacement for the Surface Machining Wizard (SMW) module. ASM offers several advantages compared to SMW, including:

- Improved range of milling strategies that are based on the strategies used in Delcam's PowerMILL application, which is the leading CAM system for machining complex shapes.
- Faster toolpath calculation.
- Greater tool control.
- Improved surface finish.

To allow existing SMW users time to plan their move to ASM, SMW dialogs are still available in PartMaker 2013, but will be removed in a future release.

If you have access to both SMW and ASM, you can choose which module to use on the **Defaults for Milling** dialog.

All SMW dialogs now include 'SMW (Legacy)' in their title.

Getting started with Advanced Surface Machining

Use the following dialogs to work with Advanced Surface Machining:

- **Surfacing Defaults** dialog — Use this dialog to set default parameters for surface machining strategies and default colors for displaying toolpath moves.
- **Surface Group Parameters** dialog — Use this dialog to create a surface group and select the machining strategies required. From this dialog you can also access the:
  - **Define Block** dialog — Use this dialog to specify the maximum and minimum limits within which machining for the surface group can occur.
  - **Safe Area** dialog — Use this dialog to specify a safe area for the surface group.
- **Strategy** dialogs — Use this dialog to specify parameters that are specific to the selected surface group.
- **Curve Properties** dialog — Use this dialog to change the properties of a profile curve for a surface machining group. For example, to specify a curve for a projection (pattern) operation for **Pattern finishing.**

Defining custom shapes

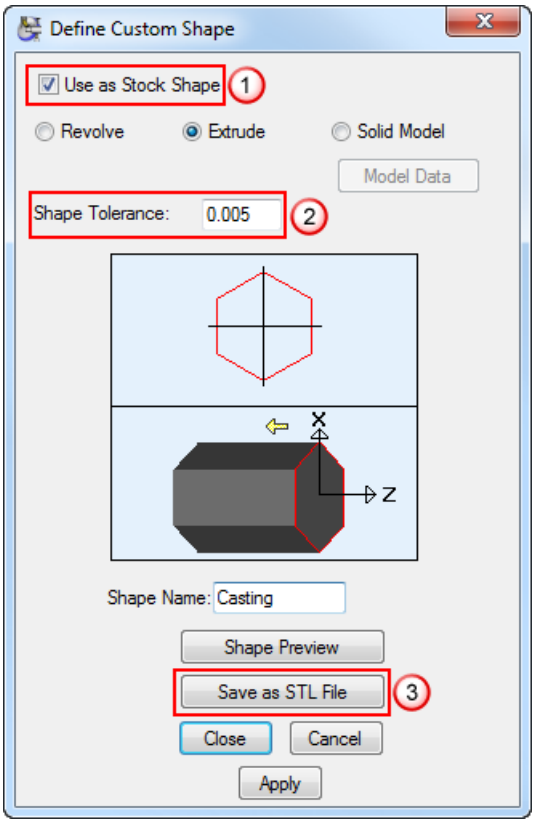
PartMaker 2013 includes several enhancements to custom shapes:

- Previously custom shapes could only represent custom stock types. Now, you can also use custom shapes to define the block limits for an **Advanced Surface Machining** group (see page 13).
- You can now save an extruded or a revolved custom shape that has been created from 2D profile geometry as an .stl file.

Because custom shapes are no longer only for custom stock types:

- The **Part Features > Define Custom Stock Shape** option has been renamed to **Part Features > Define Custom Shape.**
- The **Define Custom Stock Shape** dialog has been renamed to **Define Custom Shape** dialog.

The **Define Custom Shape** dialog includes several new settings:

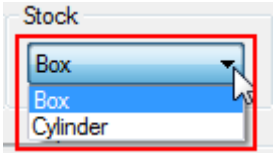
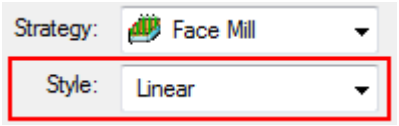
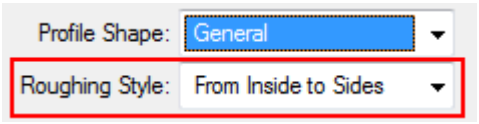


1. **Use as Stock Shape** — Select this option if the custom shape represents a stock shape. If you are using a custom shape to define cutting limits for Advanced Surface Machining, de-select this option.
2. **Shape Tolerance** — Enter a tolerance value for the shape. PartMaker uses this value when saving the custom shape to an .stl file and when calculating surface machining toolpaths whose cutting limits are defined using this custom shape.

3. **Save as STL File** — Click to save a custom shape, which has been created by revolving or extruding 2D Profile geometry, to an .stl file.

Terminology changes

To accommodate new terminology in PartMaker's Advanced Surface Machining module, some existing PartMaker terms have changed:

Old term	New term	Dialogs affected
Block	Box	This affects **Setup** dialogs for Mill XY Plane, Mill 4-Axis Plane or Mill 5-Axis Plane in PartMaker/Mill: 
Cycle type	Strategy	This affects **Profile Group Parameters** dialogs for milling, turning and WireEDM:
Cycle name	Group name	This affects **Profile Group Parameters** dialogs, **Hole Group Parameters** dialogs and the **PowerMILL Toolpath Group Parameters** dialog:
Strategy	Style	This affects **Profile Group Parameters** dialogs for Pocket Mill, Face Mill and Thread Mill strategies: 
Roughing method	Roughing style	This affects the **Profile Group Parameters** dialog (Turning) for General Grooves: 

Updated user interface

PartMaker 2013 includes many changes to improve the look-and-feel of the user interface and make it easier to use.

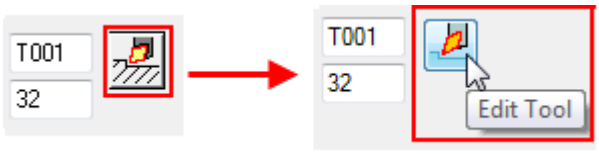
The major changes, which affect the way in which you work within PartMaker, are described in:

- Working with windows and groups (see page 1).
- Using the Process Table (see page 10).

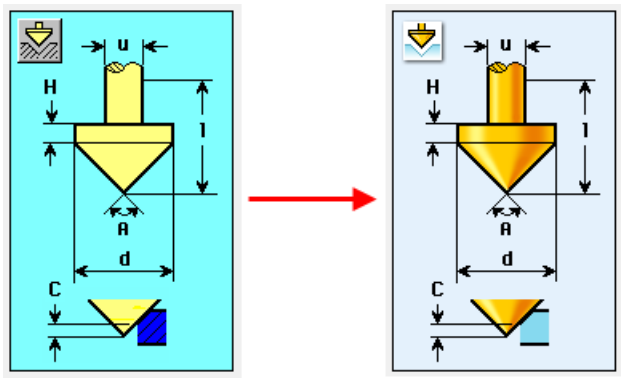
Additionally, PartMaker 2013 includes the following improvements to the look-and-feel of the user interface:

- Changes to the font used in some areas of PartMaker. For example:

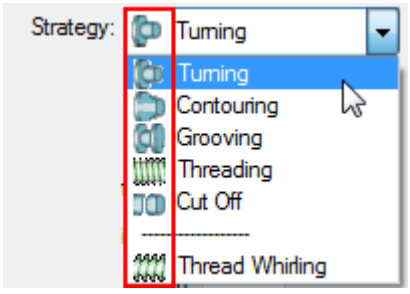
- Replacing images that perform actions with buttons, which include tool tips. For example:



- Updating images in all dialogs. For example:



- Adding new images to some dialogs. For example, the different **Strategy** options in the **Profile Group Parameters** dialog now include an image:

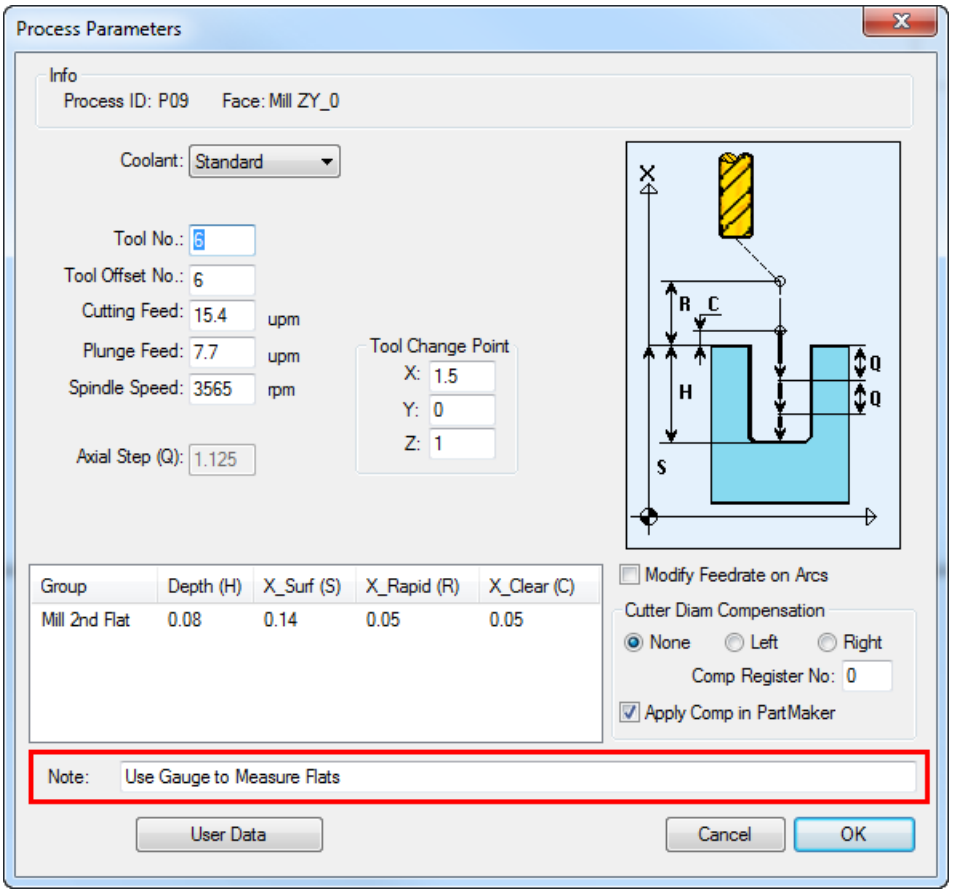


Creating notes for machining processes

PartMaker 2013 now enables you to add a note to a machining process, which can be included in setup sheets and/or NC programs.

To create a note for a machining process:

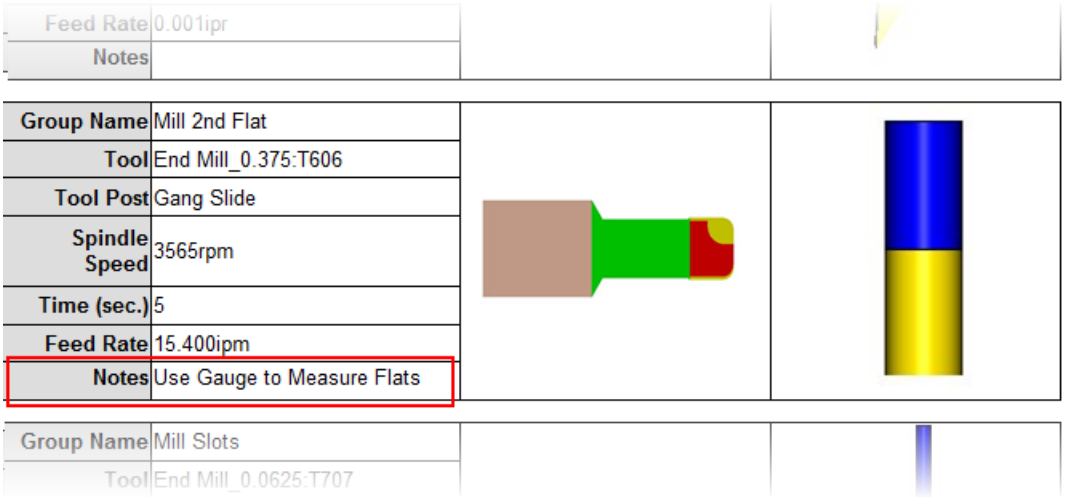
1. Double-click the process in the Process Table to display the **Process Parameters** dialog.
2. Enter the note in the **Note** field:



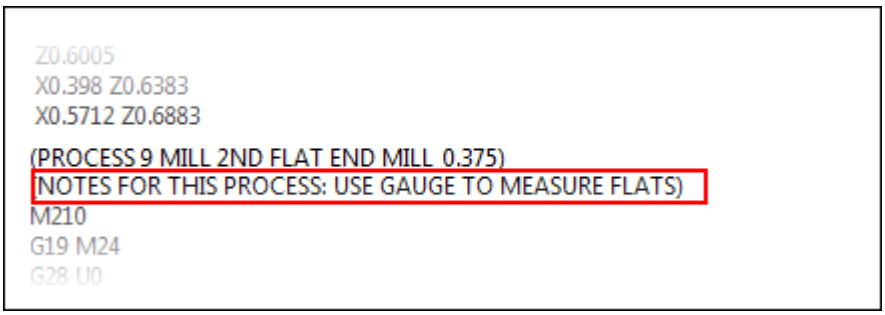
3 Click **OK** to close the dialog and return to the Process Table.

When you have created a note, PartMaker can include it in:

- Setup sheets that use the **{process-note}** setup sheet parameter; for example:



- NC programs where the postprocessor includes the **<process-note>** reserved word; for example:



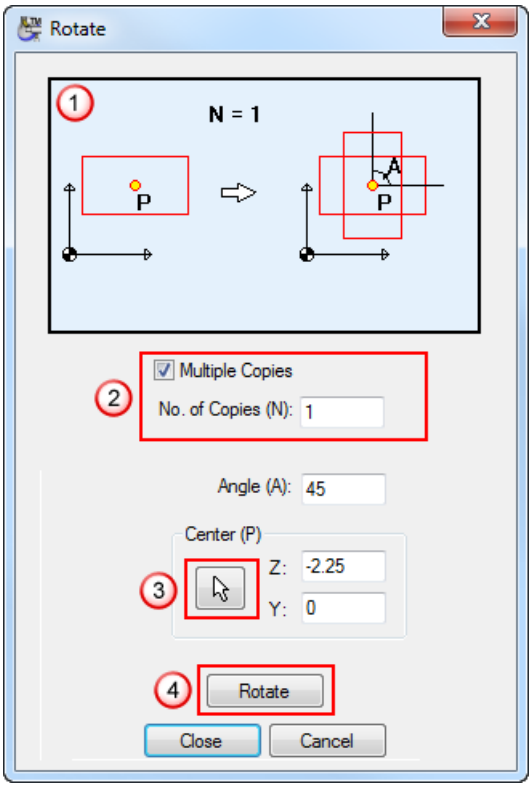
Transforming geometry, holes and profiles

You can use the **Rotate**, **Translate**, **Mirror** and **Scale** dialogs to transform selected geometry, holes or profiles. These dialogs contain the following enhancements in PartMaker 2013:

- An updated user interface to make the dialogs easier to use (see page 20).
- Enhanced settings for translating and mirroring elements (see page 21).
- Ability to select points for the transformation interactively using the selected snap mode (see page 21).

Updated user interface for Transformation dialogs

The **Rotate**, **Translate**, **Mirror** and **Scale** dialogs have an updated user interface:



1. New diagrams show the effect of the transformation you are performing.
2. A new **Multiple Copies** option, which you select to specify that you want to create a copy of the selected element(s). If more than one copy is allowed, enter the number of copies you want to create in the **No of Copies** field.

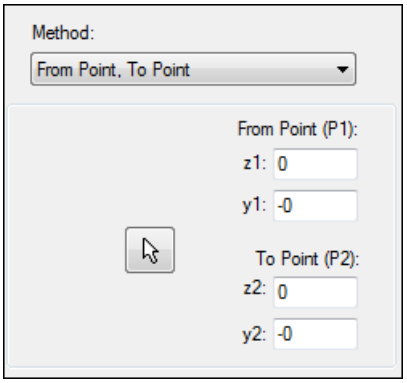
   Previously, the **No of Copies** field was always active and you had to enter **0** if you did not want to copy elements.
3. A new button for selecting points interactively in the Face window.
4. New **Rotate**, **Mirror, Translate** or **Scale** buttons that enable you to see the effects of the transformation in the Face window without closing the dialog.

Translating and mirroring elements

PartMaker 2013 contains additional settings for translating and mirroring elements.

Translating elements

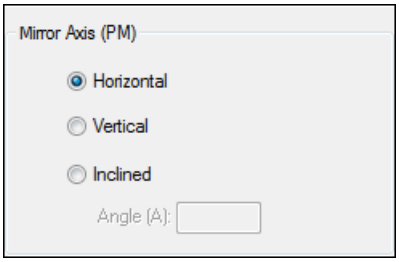
There is a new method of translating elements, specifying a **From Point** and a **To Point**:



You can specify these points by entering coordinate values directly into the fields or by selecting points interactively in the Face window.

Mirroring elements

You can now select which axis to use for mirroring elements (**Horizontal**, **Vertical** or **Inclined**):

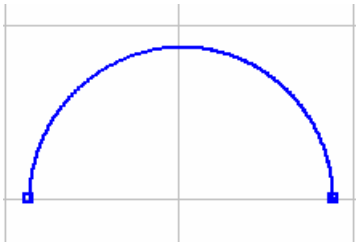


Selecting points interactively

When transforming elements in the Face window, you can now select points interactively. Snap modes are also available to ensure that your selection 'snaps' to the correct location (for example, you may want your selection to snap to a grid location).

The following steps describe how to select the center point for mirroring geometry, but the same principles apply to other types of transformation:

1 In the CAD Face window, select the element(s) that you want to mirror:



2 Select **Edit > Transform > Mirror** to display the **Mirror** dialog.

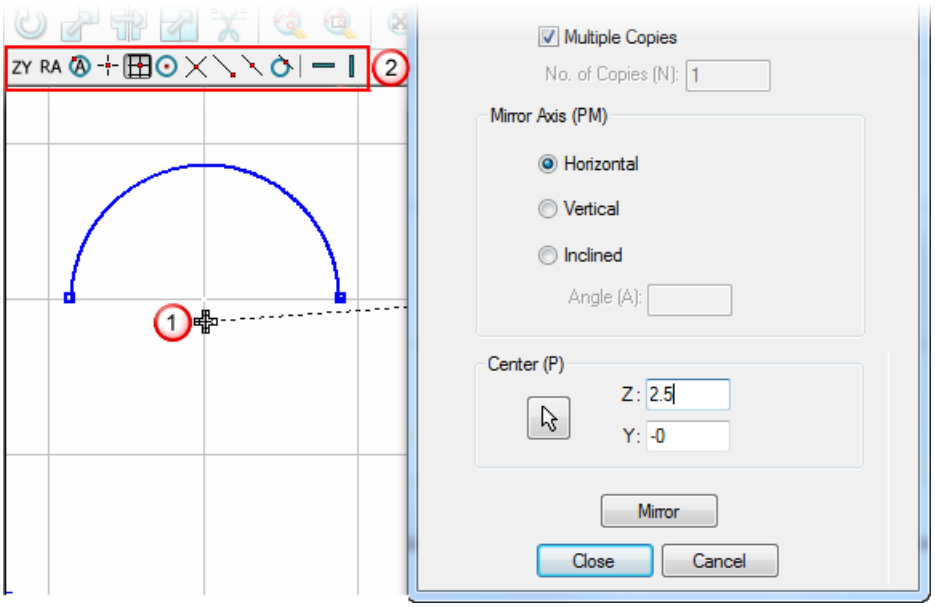
*You can also use the **Mirror** button the **Face Window** toolbar in CAD mode to display this dialog.*

3 Select **Multiple Copies** to specify that you want to create a single copy of the selected element.

4 Click to select the center point for mirroring the selected geometry interactively.

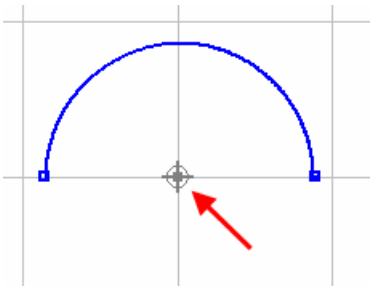
PartMaker displays:

- A cross-hair cursor, which you can drag to select the center point (see 1).
- The **Snap Modes** toolbar (see 2) so you can select a snap mode for positioning the cross-hair cursor. In this example, the **Grid Snap Mode** is selected so the cursor snaps to the nearest grid point.

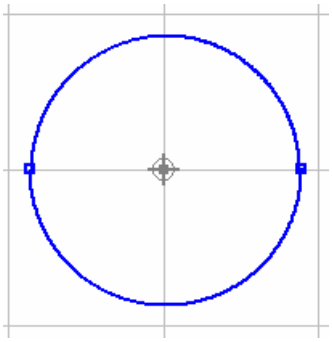


5 Select the axis for mirroring the element. This example uses the **Horizontal Axis**.

6 When the cross-hair cursor is positioned on, or near, the grid point, click the left mouse button. PartMaker updates the Face window to show the center point selected and updates the coordinate values in the **Mirror** dialog.



7 Click **Mirror**. PartMaker mirrors the selected geometry using the selected center point:

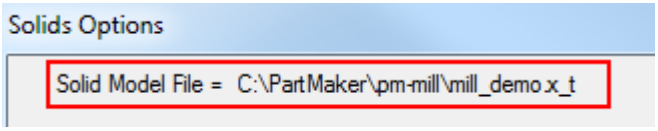


8 Click **Close** to save your changes and close the dialog.

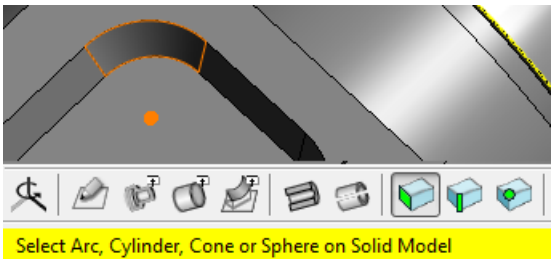
Working with solids

PartMaker 2013 includes several enhancements for working with solids:

- You can now view the name of the solid model file when using the **Solids Options** dialog. For example:



- When using the **Center** snap mode to program on a solid model, you can now select the center of an arc edge, sphere center or either end of a cylinder or cone. For example:



- The menu options referring to PowerSHAPE in the **Solids > Utilities** menu have been renamed to reflect that you can copy and paste selected surfaces or solids between various Delcam applications. The new menu options are:

  Solids > Utilities > Copy Solid Model

  Solids > Utilities > Paste Solid Model

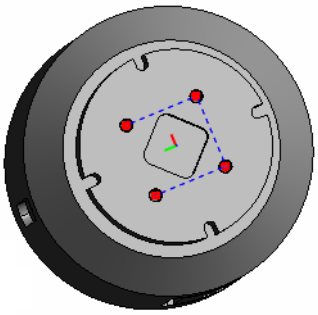
- When importing and exporting solid models, PartMaker 2013 is compatible with:
  - Solidworks 2013
  - Parasolid v24.0
- There are new menu options to control the display of:
  - The toolpath points in any toolpath on a solid model (see page 25).
  - The block limits for machining when using Advanced Surface Machining (ASM) (see page 25).
  - The tool axes used by some Advanced Surface Machining strategies on a solid model (see page 26).

Displaying toolpath points

When a toolpath has been verified, you can display each point in the toolpath on a solid model:

- Click on the Solids window toolbar and select the **Show Toolpath Points** option; or
- Select the **Solids > Set View > Show Toolpath Points** menu option.

For example:



*You can select the color used to display toolpath points on the **Solids Options** dialog.*

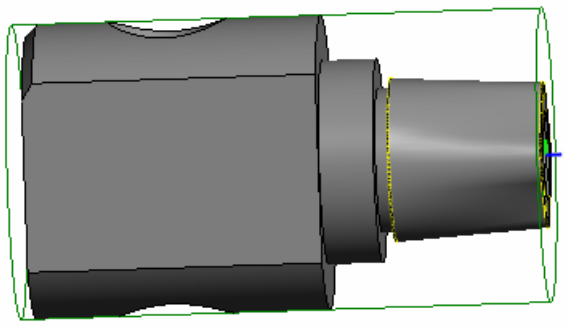
Displaying block limits

When using Advanced Surface Machining, you define the maximum and minimum limits within which machining can occur on the **Define Block** dialog.

To display the block limits on a solid model:

- Click on the Solids window toolbar and select the **Show Block Limits** option; or
- Select the **Part Features > Show Block Limits** menu option.

For example:



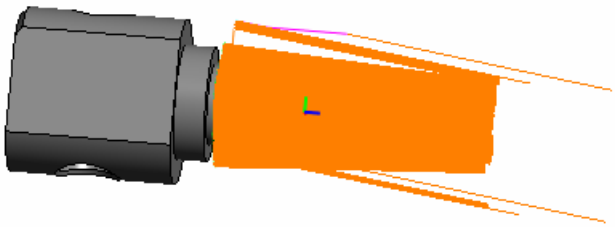
Displaying tool axes

When using the **Swarf** and **Wireframe Swarf** finishing strategies in Advanced Surface Machining, PartMaker uses the geometry to determine the tool axis.

To display the tool axes on a solid model:

- Click on the Solids window toolbar and select the **Show Tool Axes** option; or
- Select the **Solids > Set View > Show Tool Axes** menu option.

For example:



*You can select the color used to display the tool axes on the **Solids Options** dialog.*

General improvements

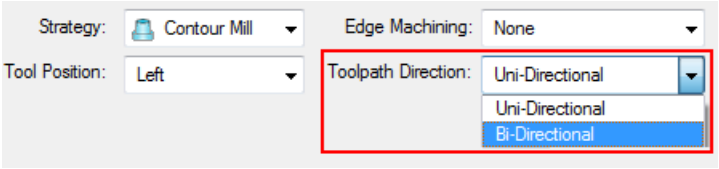
PartMaker 2013 contains the following general improvements:

- Ability to create bi-directional toolpaths for **Contour Mill** profile groups (see page 27).
- Improvements to the **Duplicate Face** dialog (see page 28).
- Ability to specify retract distances for cut-off operation (see page 29)
- New shortcut for returning to selection mode (see page 30).
- Changes to the **Table** options in PartMaker/Mill's **Setup** dialog (see page 30).
- Changes to the **Machining Function** options in PartMaker/Mill's **Setup** dialog (see page 31).
- Ability to set plunge and feed rates for groups containing imported PowerMILL toolpaths (see page 31).

Bi-directional toolpaths for Contour Mill

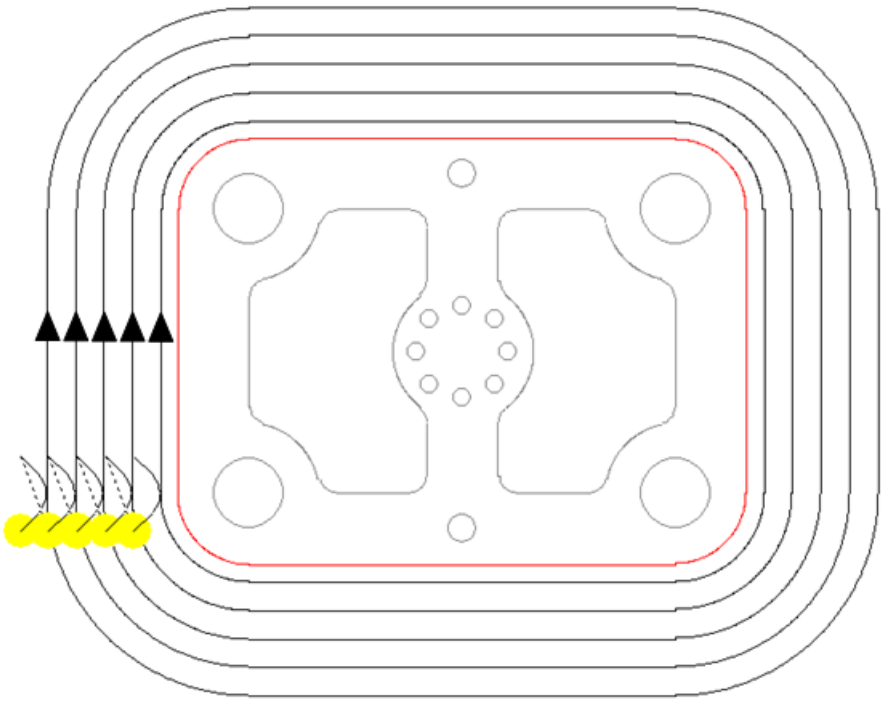
In PartMaker/SwissCAM, PartMaker/Turn-Mill and PartMaker/Mill 2013, you can now choose to create a bi-directional toolpath when using a **Contour Mill** strategy for roughing.

To create a bi-directional toolpath, select the **Bi-Directional** option on the **Profile Group Parameters** dialog:

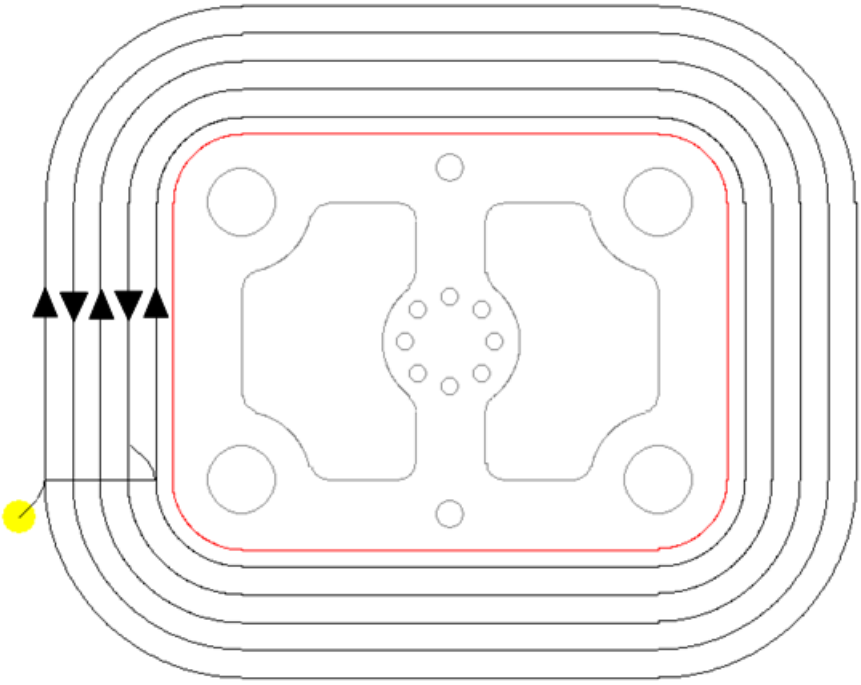


***Toolpath Direction** is available only when the **Tool Position** is set to **Left** or **Right**. You should also ensure that the **Initial Stock** value is greater than 0.*

When **Uni-Directional** is selected, the tool performs a rapid move to the Rapid Plane after each pass of the toolpath before starting the next pass in the same direction:

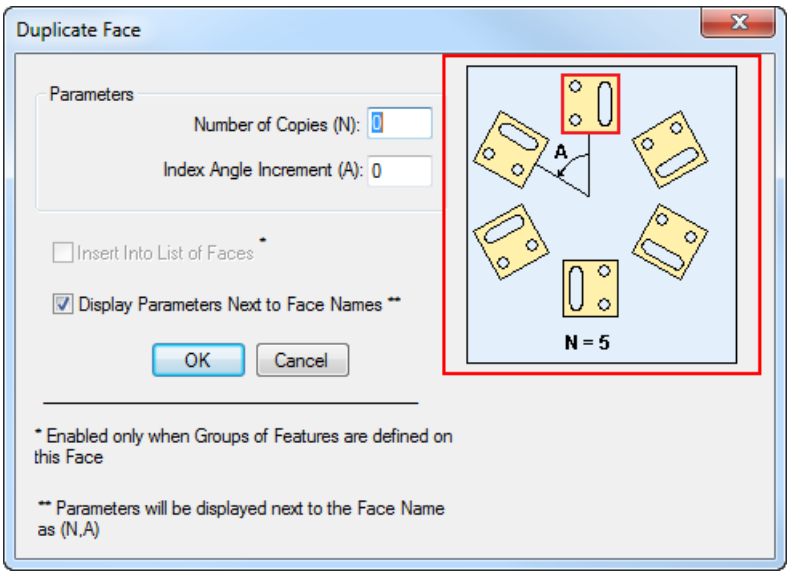


When **Bi-Directional** is selected, the tool does not retract to the Rapid Plane between passes. Instead, the tool completes one pass of the toolpath in one direction, before starting the next pass in the reverse direction:



Duplicate Face dialog

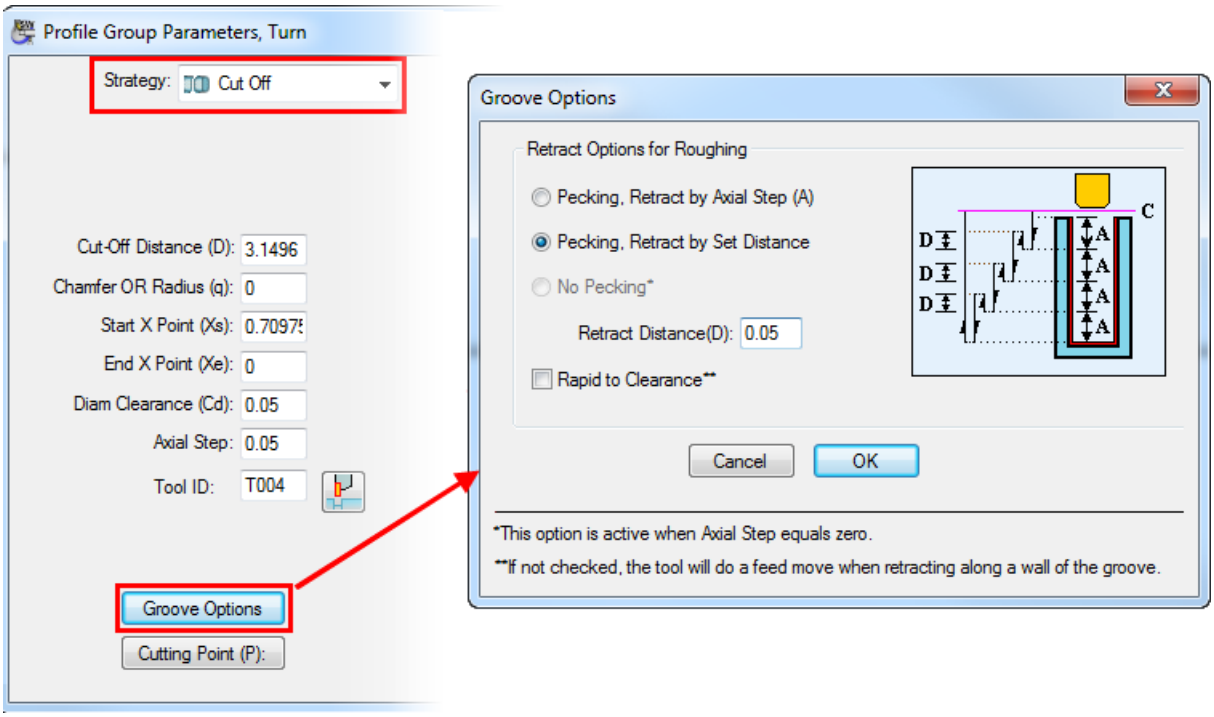
The **Duplicate Face** dialog now includes a diagram to illustrate how PartMaker uses the settings on the dialog to create duplicate copies of faces:



Retract distances for cut-off operations

In PartMaker/SwissCAM, you can now specify retract distances for tools in cut-off and grooving profile groups using the **Groove Options** dialog. Previously, this dialog was available only when programming a profile group for a rectangular or general groove.

To set these options for a cut-off operation, click the **Groove Options** button when a **Cut-Off** strategy is selected for a profile group in a Turn Face window:



*The Retract options for pecking in the **Groove Options** dialog are available only if **Axial Step** value in the **Profile Group Parameters** dialog is greater than 0.*

Shortcut for returning to selection mode

In PartMaker 2013 you can use the **Esc** key in both CAD and CAM mode to return to selection mode. This cancels any incomplete tasks in the Face window.

For example, in CAD mode:

1 If you select to add a line through two points, PartMaker displays:

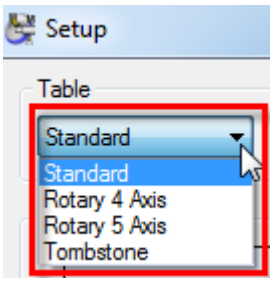
- The cursor in the CAD Face window; and
- Coordinate fields at the bottom of the Face window for you to enter the coordinates:

2 Press **Esc**, so PartMaker removes the coordinates fields and returns to selection mode (with the arrow cursor displayed):

Table options in PartMaker/Mill

In PartMaker/Mill, the **None** option is no longer available when selecting a table on the **Setup** dialog. The **None** option was previously available to provide compatibility with much older versions of PartMaker, but is no longer needed.

The **Table** options now available are:

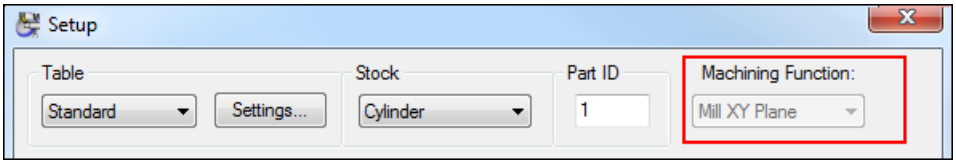


*If you open a file from an earlier version of PartMaker, where **None** has been selected as the **Table,** PartMaker 2013 automatically changes it to a **Standard** table and displays a message to inform you about the change.*

Mill 5-Axis Plane in PartMaker/Mill

The **Mill 5-Axis Plane** option is no longer available in the **Machining Function** list on the **Setup** dialog when using a **Standard** table in PartMaker/Mill, as PartMaker does not support the type of machine needed to perform this machining function on a **Standard** table.

The **Mill XY Plane** option is now the only option available when using a **Standard** table:

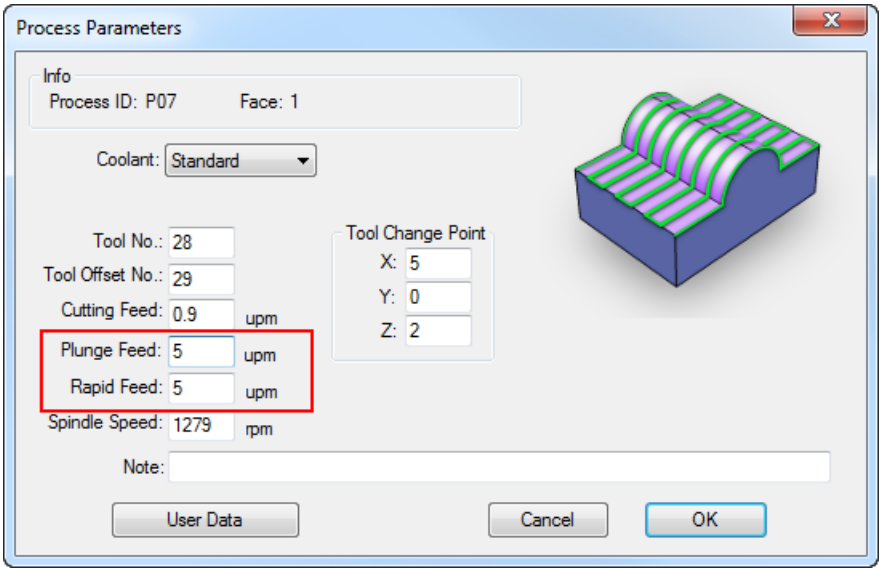


*If you open a file from an earlier version of PartMaker, where **Mill 5-Axis Plane** has been selected as the **Machining Function** for a **Standard** table, PartMaker 2013 automatically changes it to a **Mill XY Plane** and displays a message to inform you about the change.*

Plunge and feed rates for imported PowerMILL toolpaths

PartMaker 2013 enables you to specify the **Plunge Feed** and **Rapid Feed** rates for a machining process that has been created from an imported PowerMILL toolpath. Previously, PartMaker used the default **Rapid Feed** rate from the **Defaults for Milling** dialog to set the **Feed Rate** for these processes, which could not be changed.

The new **Plunge Feed** and **Rapid Feed** settings are available on the **Process Parameters** dialog:



ConfigPost enhancements

ConfigPost 2013 includes the following changes to reserved words on ConfigPost:

- `<process-note>` has been added so you can include notes associated with machining processes (see page 18).
- `<is-c-axis-smw>` has been renamed to `<is-c-axis-surf-mill>` for use with Advanced Surface Machining.
- `<is-smw>` has been renamed to `<is-surf-mill>` for use with Advanced Surface Machining.