
What's New in VCarve Pro 6 & 6.5

A quick start guide for VCarve Pro
upgraders

Vetric Ltd.

Document V.1.0

Overview

This *What's New* document is intended for those of you who are already familiar with VCarve Pro and just want to check out the new stuff, which is highlighted here. To aid this process, the changes associated with version 6.5 and version 6 have been separated into the two major sections of this document. If you are upgrading from version 6, the second section of this document should already be familiar to you and you may wish to focus only on the very newest stuff in section one. However, if you are upgrading from VCarve Pro 5.5 or earlier you will benefit greatly from both sections of this document.

This document is structured as follows:

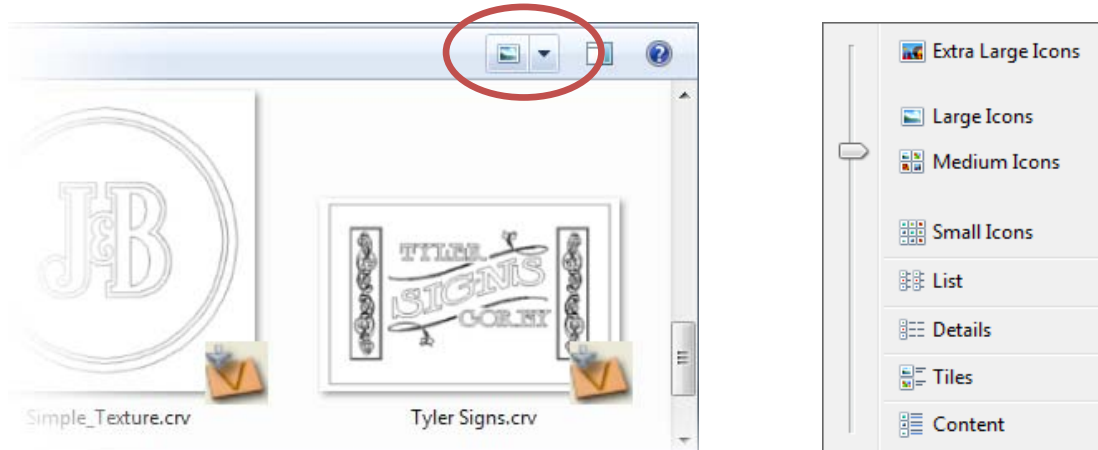
- *New for VCarve Pro 6.5*
 - New Features
 - Enhancements
- *New for VCarve Pro 6*
 - New Features
 - Enhancements

If you are completely new to VCarve Pro, this probably isn't the right document for you. Instead you should refer to the VCarve Pro User Guide and VCarve Pro Reference Manual for a full overview of VCarve Pro's capabilities and a comprehensive explanation of each tool and feature of the software.

New for VCarve Pro 6.5

Integrated Windows Explorer Thumbnail Support From VCarve Pro 6.5 onwards, CRV files automatically include thumbnails when they are saved. Windows Explorer can make use of these thumbnails to show you a preview of each file when you browse a folder.

When browsing a folder of CRV files in Windows 7, select **Medium Icons** or larger from the available options in the **Change your view** control, located at the top of the Windows Explorer view.



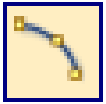
Thumbnails are supported for Windows XP and later, but the method of selecting thumbnail view in Windows Explorer described above is specifically for Windows 7 and will differ slightly for other Windows versions.

Drag & Drop

If no file is currently open, VCarve Pro supports Windows drag and drop functionality to open a file directly from Windows Explorer. Simply click and drag the thumbnail of the file you wish to open from the Explorer Window into VCarve Pro's window.

Note: You will only see thumbnails for CRV files saved from VCarve Pro version 6.5 or later. If you are only able to see the default VCarve Pro file thumbnail, you should open and re-save the file using the normal **File>Open** and **File>Save** commands in the latest version of VCarve Pro.

Create Arc



The **Create Arc** tool allows a single arc span to be created using precise values, or dynamically within the 2D View.

Left click the mouse in the 2D View to set the start point of an arc. Click again to set the end point position.

Move the mouse and click a third point to set the arc's radius or, alternatively, select **Radius**, **Height** or **Mid Point** on the **Create Arc** form and enter the precise value you need.

Notes

- Clicking the Right mouse button or pressing the Esc key finishes the operation
- The properties of an arc can be edited at any time by selecting the arc before choosing the **Create Arc** tool. This opens the form with the current properties and position of the selected arc and these values can then be edited. Click **Apply** to update the selected arc with the new values.

Drawing

Create Arc

Start Point
X: 11.222 Y: 37.913

End Point
X: 24.172 Y: 45.076

Radius -25.0

Height -1.12

Mid Point
X: 17.155
Y: 42.475

Create Close

Printing & Print Preview

The contents of either the 2D or 3D view can be printed using the **Print** command on the **File** menu. Simply select the view you wish to print (2D or 3D) and then click the Print command. The standard Windows printer dialog allows you to select the printer and adjust its properties. When the **OK** button in this dialog is clicked, the view will be printed. To adjust the printer settings without printing, you can open the same dialog using the **Print Setup...** command on the **File** menu. When used in this way, the **OK** button on the dialog will store the settings without printing immediately.

By default printing the 3D view does not print the shaded background; this behavior can be changed using the options dialog, which is opened using the **Options** command on the **Edit** menu.

The **Print Preview** command on the **File** menu allows you to check the layout of your page before you print. If you are happy with the preview, use the **Print...** button to begin printing the document directly from the **Print Preview** page.

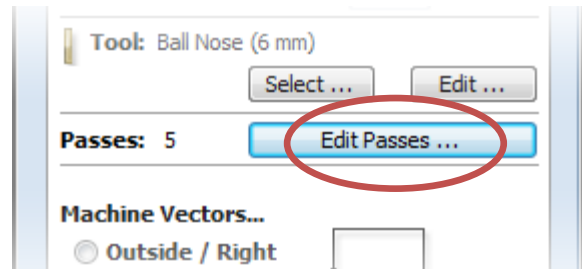
The printed view is always scaled to exactly fit the currently selected page size (including allowance for margins). Drawings are not, therefore, printed at actual size and are not printed across multiple pages.

New Options for Existing Tools for VCarve Pro 6.5

As well as completely new features, this version of VCarve Pro includes a number of enhancements and new options to the existing features of VCarve Pro 6.

Pass Depth Control for Profiling

When a profile toolpath is created, the **Pass Depth** value associated with the selected tool (part of the tool's description in the **Tool Database**) is used to determine the number of passes needed to profile down to the specified **Cut Depth**. However, by default VCarve Pro will also modify the tool step down by up to 15%, if by doing so it is able to reduce the total number of passes required to reach the desired cut depth. It is usually desirable to benefit from the significantly reduced machining time of cutting profiles using less passes if possible. Nevertheless, there are some occasions where the exact step down for a given profile pass needs to be more precisely controlled - when cutting into laminated material, for example. The **Passes** section of the **2D Profile Toolpath** page indicates how many passes will be created with the current settings. The **Edit Passes...** button will open a new dialog that enables the specific number and height of passes to be set directly.



Specify Pass Depths

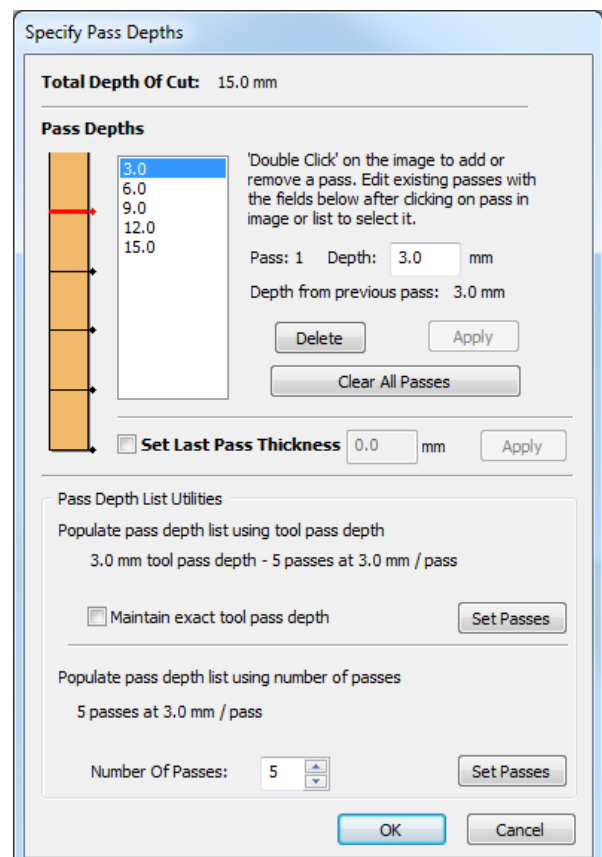
The **Pass Depths** section at the top of the form shows a list of the current pass depths. The relative spacing of the passes is indicated in the diagram next to the list. Left click on a depth value in the list, or a depth line on the diagram, to select it. The currently selected pass is highlighted in red on the diagram.

To edit the depth of the selected pass, change the value in the **Depth** edit box and click **Apply**.

The **Delete** button will delete the selected pass.

The **Clear All Passes** button will delete all the passes.

To add a new pass, double left click at the approximate location in the passes diagram that you wish to add the pass. A new pass will be



added and automatically selected. Edit the precise **Depth** value if required and then click **Apply**.

The **Set Last Pass Thickness** option will enable an edit box where you can specify the last pass in terms of the remaining thickness of material you wish to cut with the last pass (instead of in terms of its depth). This is often a more intuitive way to specify this value.

Pass Depth List Utilities

This section of the form includes two methods for creating a set of passes in one go.

The first method simply sets the passes according to the Pass Depth property of the selected tool. By default, this is the method used by VCarve Pro when it creates profile passes initially. However, the **Maintain exact tool pass depth** option checked, VCarve Pro will not vary the step size to try and optimize the number of passes (see above).

The second method creates evenly spaced passes according to the value entered in the **Number Of Passes** edit box.

To apply either method click the associated **Set Passes** button to create the resulting set of pass depths in the passes list and diagram.

Note: Setting the number of passes with either of these utilities will discard any custom passes you may have added.

Miscellaneous Improvements in VCarve Pro

6.5

Improved Font Previews

When browsing the installed fonts in the Create Text tool, VCarve Pro shows a small preview sample of text using each font. The set of characters in the preview now includes some numbers, which can often be valuable in aiding font selection for some projects.

Extensions to the embedded Calculator

The number edit boxes on most VCarve Pro forms and dialogs can also interpret simple sums and equations. In VCarve Pro 6.5 there are now two new constants, **M** and **I**, which you can use in number edit boxes to simplify conversion to millimeters and inches, respectively.

Example: Thus entering **1.0*M=** into a number edit box will result in 25.4, the number of millimeters in one inch.

Faster start-up time

VCarve Pro 6.5 takes advantage of multi-threaded processing to significantly reduce the time it to start VCarve Pro and start working.

Saving PNG images of your 3D View

It is often useful for advertising or customer approval to be able to capture an image of your 3D simulation. When using **View>Save Shaded Image**, a new file type option has been added in VCarve Pro 6.5 enabling you to save PNG files. The PNG has the unique benefit of supporting background transparency so that your image can be cut and pasted into other images or documents without including the 3D View background. To enable this feature, simply switch off the gradient background setting in the 3D View Options – subsequently saved PNG images will have transparent backgrounds.

New for VCarve Pro 6

This chapter describes the new tools in VCarve Pro 6

- The *Interactive Distortion Tool* allows you to bend or flex a vector or component using VCarve Pro's node editing tools to manipulate a distortion envelope surrounding the target object.
- *Toolpath Tiling* allows you to overcome any limitations of your machine's bed, or available material block size so that you can still cut large projects.

Distort Tool



This tool allows you to bend and flex a vector by manipulating a distortion envelope using VCarve Pro's standard node editing tools. You can select one or more vectors or components and then use one of the three different tool modes to create your initial

Once the distortion envelope has been created, you can use VCarve Pro's node editing tools to add or edit its nodes and spans. As you alter the shape of the envelope the associated object will be distorted to reflect the changes.

Distorting a Previously Distorted Vector

Once a vector has been distorted, node editing will always relate to the object's distortion envelope. If you wish to edit a distorted vector directly again, you will first need to permanently apply the distortion to the shape. To do this, use the *Convert to Curves* command.

Bounding Box

This option is available if you have a selection of vectors. It creates a distortion envelope based on the closest bounding box that can be drawn around your selection. Thus the resulting envelope is always initially a rectangle, comprising four line spans and a node at each corner. Using the normal node editing tools, however, you can modify this envelope as much as you like and the shape within it will be distorted accordingly.

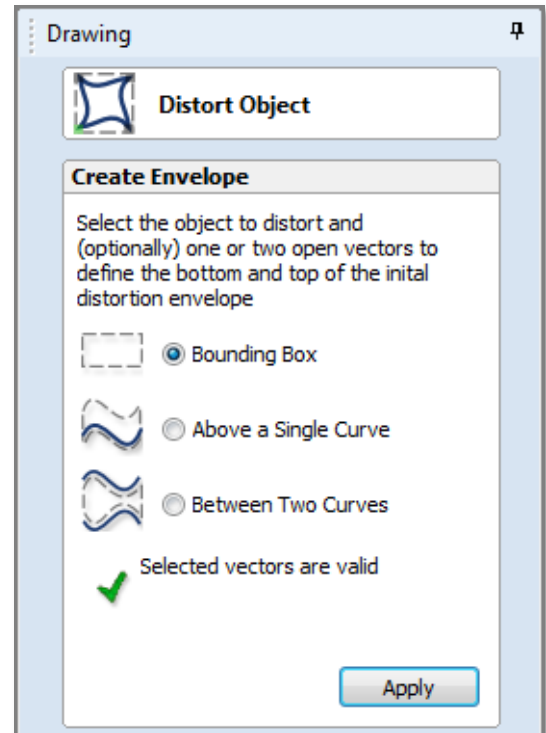
Along A Curve

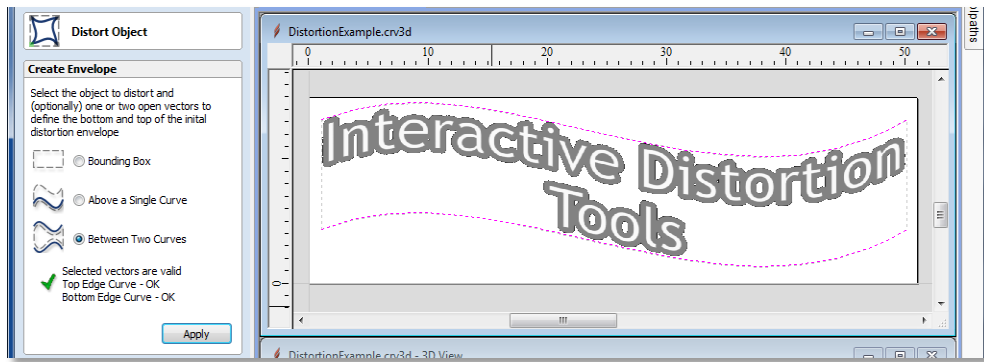
This option is only available if the last item in your selection is an open vector that VCarve Pro can use to define a curve along which the other selected objects will be distorted.

Using this option, you will usually end up with your objects bent to match the curve in your original selection. The distortion curve itself is left unchanged by this operation.

Between Curves

This option will become available if the last two objects in the current selection are open vectors, between which the other objects can be distorted.





The selected objects will be stretched and squeezed between the two curves that were last in the selection. Neither of the contributing distortion curves in the selection will be altered by the operation.

Toolpath Tiling



Using the Toolpath Tiling options it is possible to machine objects and designs that are many times larger than the available area of your CNC machine bed. This process is also invaluable if the maximum sizes of your material pieces are limited. In both case, a much larger project can still be achieved by breaking the toolpath down into manageable tiles or strips, each of which can fit within the machineable area of your CNC machine, or on the available material blocks. Once cut, the tiles can then be re-assembled to form the finished piece.

The process of tiling begins by creating toolpaths based on the final object entirely as normal – at this stage you do not need to take any account of the available machining bed size. Once you have calculated required toolpaths, click on the toolpath tiling button in the toolpaths pane to open up the toolpath tiling form.

The Toolpath Tiling Manager

The toolpath tiling form will 'split' the full-size toolpaths into a number of discrete, but precisely aligned, toolpath tiles as soon as you click the Update Tiles button. While the Tile Toolpaths mode is enabled (using the checkbox on this form) any toolpaths that you save will automatically divided into tiles.

The top section of tiling form allows you to set the type of tiling you require (see below for more information) and the appropriate settings for each tiling strategy.

The lower section of the tiling form allows you to select and activate each of the tiles. The currently active tile can be previewed in either the 2D or 3D View.

Tiling Options

There are three layout strategies for tiled toolpaths, the most appropriate one will depend on your machines capabilities and the available material.

Individual Tiles

The first tiling option is for individual tiles. This splits the current job in both X and Y, to form a series of entirely separate toolpaths. This is generally the preferred option if you have independent pieces of material to

machine, or if you have a moving-bed type CNC machine that will not allow you to ‘overhang’ material outside of the machineable area.

With this option selected, you are asked to specify the width and height of each tile, and the required overlap (which will be applied in each direction). Tiles are created from the bottom left of your model. The overlap for independent tiles is particularly important for 2.5D toolpaths that utilize the shape of your tool bit (such as V-bit carving). 2.5D toolpaths will need to ‘overrun’ the edges of your tile in order to complete their cuts using the side of the bit. For this reason, the overlap distance for Independent Tiles will typically need to be at least equal to the radius of your tool bit.

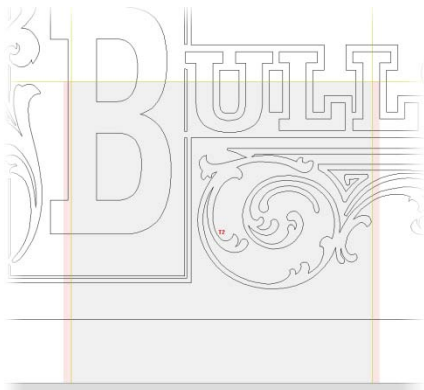
Feed-through in X or Feed-through in Y

Instead of cutting a series of individual pieces of material and assembling them later, it can also be convenient to cut a single strip of material using a series of set-ups – moving the material through the machineable area between cuts. VCarve Pro specifically supports this technique using the Feed-through in X/Y options. In these cases you will only need to define either the Tile Width or Height (which corresponds to your intended feed-through distance), as the other dimension is assumed to correspond to the shorter side length of your material and will match the equivalent current job dimension. Similarly, the overlap distance is only applied in the direction of the draw-through. Because you will typically be cutting the same piece of material with each toolpath tile, the overlap distance for Feed-through is not as critical as for Individual tiles and is typically used to allow for a margin of error in your set-up accuracy.

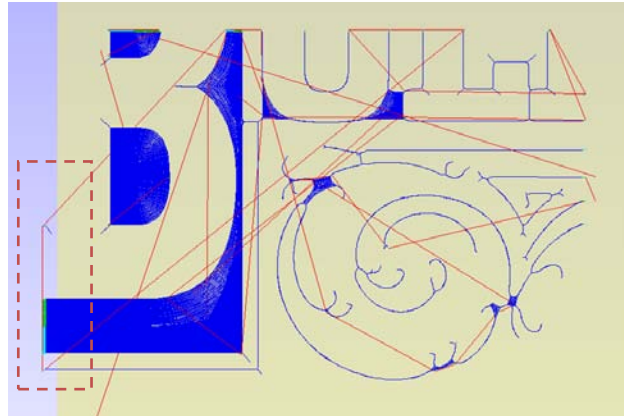
Once you have set your tiling option, click the Update Tiles button to see your settings reflected in the Tile Previews in either the 2D or 3D Views.

Tile Previews

The 2D View indicates how the model area is split into tiles. The yellow lines indicate the tile sizes, but the light red areas also indicate the overlap region for each tile. You should pay particular attention to the fact that this overlap can take the toolpath outside of the tile boundary – this is necessary to ensure that 2.5D toolpaths, in particular, form the correct shapes at the tile edges.



An independent toolpath tile preview in the 2D View. The light red areas indicate the current overlap settings for this tile.



This image shows the same toolpath tile's 3D preview, positioned relative to the machining origin. You should note that the tool will machine negative, as well as positive, relative to its origin in this case. You must allow for this necessary effect when setting up your material and origin for machining.

When you come to machine these tiles you should take care to allow for the overlap distance when setting your machining origin on your material. Internal tile toolpaths can machine negative, as well as positive, relative their origin.

The currently active tile can be set directly from the 2D View by double-clicking on the background of one of the indicated tile regions.

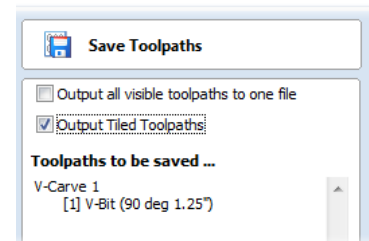
Simulating Tiled toolpaths

You can also view and simulate individual toolpath tiles in the 3D View. To view the toolpath tiles, simple ensure that the toolpaths are visible (checked in the Toolpath List) and then select the tile you wish to see either from the Tile Toolpaths from, or the 2D View (see above).

Since tiles are created so that they will all be cut within the same machineable area (i.e. they are all located in a similar position relative to the machining origin), this can make them difficult to visualize using Preview Toolpaths. Simulating each toolpath tile in its absolute position will result in the toolpaths being cut in the same region of your preview block and they will overcut the same area. The Tile Toolpaths form has an option *Draw toolpaths in original position for visualization* to allow you to simulate the tiles as if they were arranged in their final pattern. With this option enabled, you can visualize how your final piece will look by previewing all your toolpath tiles together, but you should note that it will not reflect the true offset of each toolpath from your machining origin.

Saving toolpath tiles

Provided you have created toolpath tiles using the Tile Toolpaths form, an additional option, Output Tiled Toolpaths, will be available in the toolpath saving form.



It will be checked or unchecked to match the current state of the Tile Toolpaths check box in the Tile Toolpaths form.

Note: If the Output Tile Toolpaths option is grayed-out this means that no tiles have been created. You will need to close the Save Toolpaths form and use the Tile Toolpaths form to create the toolpath tiles before continuing.

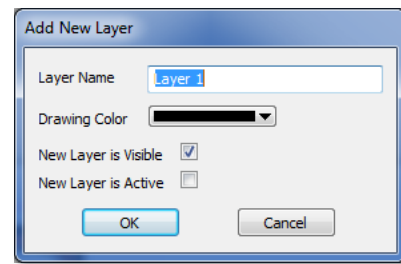
New Options in Existing Tools for VCarve Pro 6

A number of tools have been enhanced or updated in VCarve Pro 6 to add new functionality or to improve the workflow when using them.

- Layer management has also been improved with additional control over layer ordering, and the ability to automatically activate new layers as and when they are created.
- Tool Templates are a powerful new way of applying commonly used toolpath settings and strategies to your project, rapidly and efficiently.
- The Tool Database can now be organized into groups of similar tooling, and notes can be added to your tool definitions.
- Additional Preview Control tools have been added. These give you precise control over the toolpath simulation process. In addition you can now single-out a sub-set of your calculated toolpaths and easily simulate them in isolation.
- Where appropriate, the numerical edit fields on VCarve Pro's tool forms can now perform simple calculations in-situ, saving you time and helping to reduce errors.

Layer Management

A number of improvements have been made to the way that VCarve Pro helps you to manage your 2D drawing layers. A simple but very useful addition is the New Layer is Active option on the Add New Layer dialog. With this option checked, newly created layers will become active and subsequent actions will automatically use it.



Layer Ordering

While the visibility of vectors is largely unaffected by the order in which they are drawn, Bitmap & 2D Component Previews can easily obscure one another if drawn in the wrong order (see [Component Preview Drawing Order](#) for a longer discussion on this issue). Layer order can be changed from layer management dialog using the up and down arrow icons below the layer list control.

New Copy to Layer pop-up command

When you right-click an object in the 2D view an additional option to copy (rather than move) to a new or existing layer is now available.

Ungroup to the group's layer

By default, when grouped objects are ungrouped they revert to the layers on which they had previously been located before the grouping operation. However this is sometimes inconvenient. For example, when you have copied a group of vectors to a new layer, it is easier for subsequent editing if the copied vectors to remain on the new layer, even after ungrouping. An alternative right-click pop-up menu command has been added to make this process easier.

A new shortcut key combination has also been added to provide support for both of the ungroup operations.

Shortcut	Action
G	Group the selected objects
U	Ungroup the selected objects to their <i>original layers</i> , sub-groups remain grouped.
Ctrl + U	Ungroup the selected objects to the <i>group's layer</i> , sub-groups remain grouped.
Shift + U	'Deep' ungroup the selected objects to their <i>original layers</i> . Sub-groups are also ungrouped.
Ctrl + Shift + U	'Deep' ungroup the selected objects to the <i>group's layer</i> . Sub-groups are also ungrouped.

Quick select all vectors on a layer

The layer manager now allows you to quickly select all of the vectors (automatically excluding other objects, such as component previews) on a particular layer. Simply double-click the layer name in the layer list of the Layer Manager. VCarve Pro will activate the clicked layer, and select all the vectors on it.

Toolpath Templates



Toolpath templates allow you to improve the efficiency of your production processes by saving the complete toolpath settings for common operations. These settings can then be re-used at any time on different design geometry. Frequently used strategies and tooling can thus be applied to similar jobs, quickly and easily.

Simple Toolpath Templates

Using the *Toolpaths* → *Templates Save Selected Toolpath as Template* menu command (or the associated icon), all the settings for the currently selected toolpath can be saved as a template.

When you reload this file (using *Toolpaths* → *Templates* → *Load Template...*) you will have an empty toolpath which can be edited by double clicking on its name in the toolpath list or selecting the *Edit Toolpath* icon in the Toolpaths tab. Once the toolpath form is open, the vectors to be machined can be selected and the toolpath calculated using all the saved settings.

The *Toolpaths* → *Templates* → *Save All Visible Toolpaths as Template* menu command (or the associated icon) allows a group of toolpaths to be saved as a single template. As an example, the toolpaths may have all the settings used for Profiling and Pocketing operations for a particular type of job and material combination. These toolpaths settings can then be recalled simply by opening the template and selecting the appropriate vectors for each toolpath.

Vector Selection

To help with selecting the vectors used for a particular toolpath, the **Vector Selector** tool has been added. The dialog for this tool allows you to easily select vectors which meet a set of criteria, such as open, closed, circular and also matching constraints based on layers. The dialog can be accessed from the *Edit* → *Vector Selector* menu item, or from the **Selector...** button on each toolpath form. When the command is executed the dialog shown on the left is displayed.

The dialog is used to configure a set of 'filters' that determine which vectors will be selected. As a filter is enabled by clicking on its check box, or selecting a different 'radio button' option, the current selection will be updated with all the objects in the file which match the current filter options.

Generally you will start at the top of the dialog and work downwards, specifying more and more explicit filters to determine the required selection exactly.

The simplest option is just to use the form to *Select Closed Vectors* in the job or *Select Open vectors* (you can specify both, in which case *all* vectors will be selected as long as they are on a visible layer).

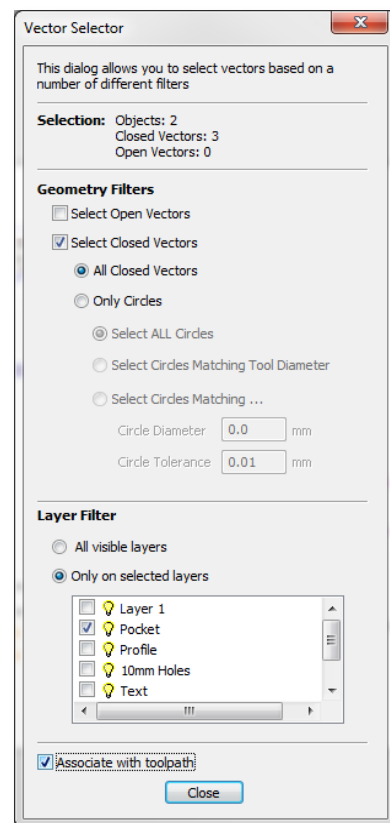
The most common way to use the **Vector Selector** is to select all the vectors on a given layer as shown in the screenshot of the dialog below.

In this example, the dialog has been used to select *All Closed Vectors* on the layer with the name *Pocket*.

The **Selection:** section at the top of the dialog is continuously updated to show the results of the current filter and the 2D view is also updated to show what is currently selected. The *Objects:* entry shows the total number of objects selected, if these objects include Text or Groups, this number may be less than the total of *Closed* and *Open* vectors displayed on the following line. For instance, a block of text is one object but will usually consist of many closed vectors. If a group contains both open and closed vectors, it will be selected as matching both *Open* and *Closed* filters.

The **Geometry Filters** section is used to specify constraints on the type of vectors to select. You can choose to select open vectors and/or closed vectors. Instead of selecting *All Closed Vectors*, the dialog can be used to select *Only Circles* and can even be used to specify an exact diameter and tolerance for the circles to be selected. This can be very useful for selecting vectors for drilling toolpaths, particularly if the vectors have not already been sorted into layers.

The **Layer Filter** section allows you to pick one or more *visible* layers on which to select vectors which match the geometry filter. Alternatively, the *All visible layers* option disables the filtering by



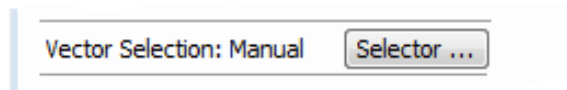
layer and selects all vectors which match the geometry filter regardless of the layer they are on, as long as that layer is visible.

The *Associate with toolpath* option will be explained in the next section.

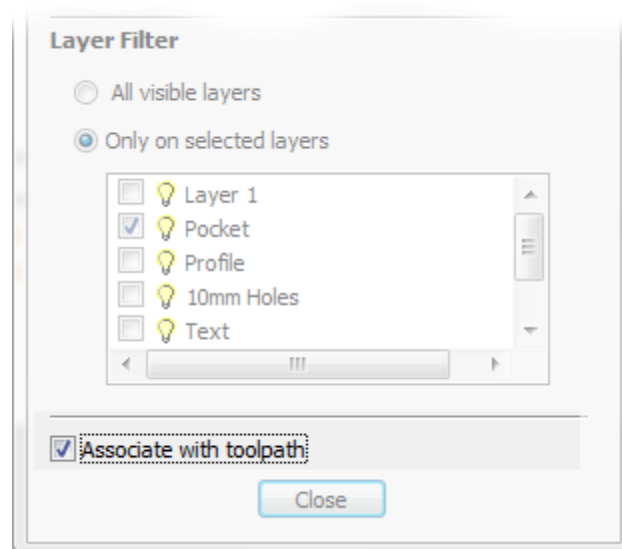
Advanced Toolpath Templates

By associating a template with the result of a *Vector Selection* filter, we can make a template automatically select the vectors it is intended to machine. A simple case would be to create a template which consisted of a Pocketing toolpath set up to machine all closed vectors on a layer called *Pocket*. After loading this template into a new job and choosing **Toolpaths** → **Recalculate All Toolpaths** the toolpath would be recalculated, automatically selecting all closed vectors on the layer called *Pocket*.

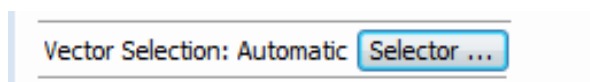
The advanced templates are created by selecting the vectors for a toolpath using the **Selector...** button on the toolpath form. When a toolpath form is first opened, the **Vector Selection:** section on the form will show that vectors are being selected manually as shown below...



Pressing the **Selector...** button will display the **Vector Selector** form as shown previously. After making your geometry selection and before you close the form, select the *Associate with toolpath* option on the form as shown below.



After the **Vector Selector** form closes, the Toolpath form will indicate that Vector Selection is now 'Automatic' as shown below...

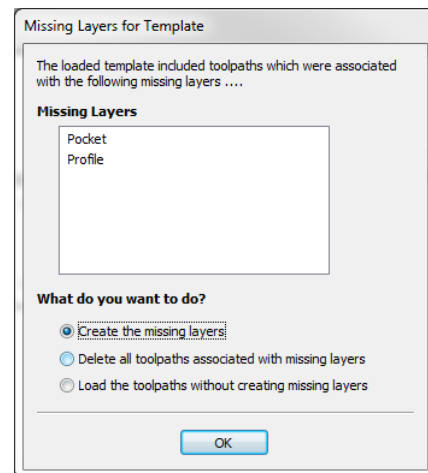


IMPORTANT: Calculate the toolpath to apply the changes you have made.

When you re-calculate or edit a toolpath that has the **Vector Selection** mode set to automatic, the vectors which match the filter when the toolpath is re-calculated or edited will be selected. To cancel the *Automatic* vector selection mode, you can just select the vectors to machine normally with the mouse, or use the **Selector...** button to bring up the **Vector Selector** dialog again (the settings are remembered) and uncheck the *Associate with toolpath* option.

If toolpaths with the **Vector Selection** mode set to *Automatic* are saved as templates, these settings are saved with the template. When the template is re-opened and the toolpaths recalculated, they will automatically select all vectors which match the filters specified with the **Vector Selector** for that toolpath.

If you load a toolpath template which has toolpaths associated with layers which don't exist in the current file, the **Missing Layers for Template** dialog will be displayed. It lists all the missing layers and offers you the choice of having them created automatically, deleting toolpaths associated with missing layers or just loading the toolpaths as is.



Choosing to allow the dialog to automatically create the missing layers allows a toolpath template to be used to create 'standard' layers for machining operations and load the toolpaths ready to be calculated. All you then need to do is move vectors to the appropriate layers and recalculate all the toolpaths.

Choosing the *Delete all toolpaths associated with missing layers* option allows you to create a single template with many toolpaths and have the ones which aren't appropriate to the current job automatically deleted.

Tool Database

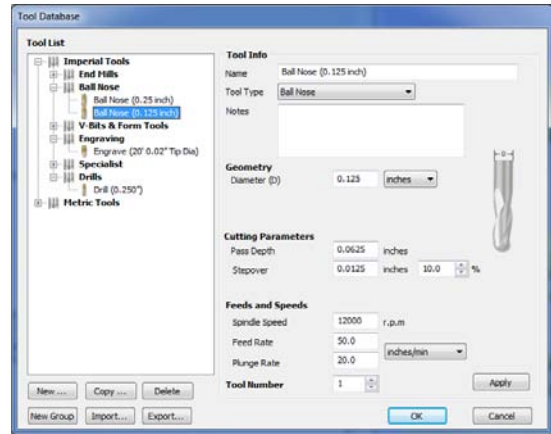


The tool database has seen a significant overhaul in VCarve Pro 6. The most immediately obvious change is that you can now group tools in any way you like.

As with many lists in VCarve Pro, you can reorder your tool database by simply dragging and dropping the tools in the locations that you want them.

Creating a new tool group

Click on the add **New Group** button then give your new group a name and press **Apply** to add it to the database. Click and drag tools from the database over the top of the newly created group icon in the tool database tree to add them to the group. Alternatively, select the group and then click the **New...** button to create a new tool directly within the selected group.

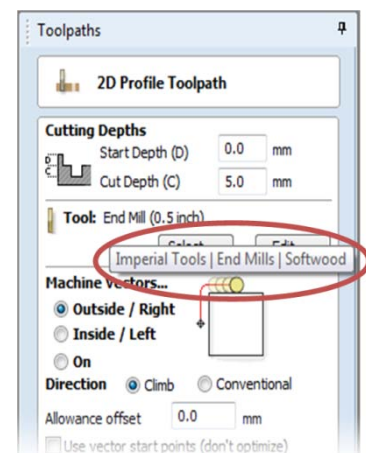


Tool Notes

The tool notes section simply allows you to save any additional text descriptions, special instructions or relevant information you may require, within your tool definition.

Tooltip of group hierarchy

When a tool is selected within a toolpath strategy page, the tool name does not always provide enough information for you to know whether the tool's settings are appropriate. This will become particularly significant if you import a toolpath template (see Toolpath Templates) with a tool that has been pre-defined (perhaps by a 3rd party) when the template was created. It is always possible to click Edit and see the full set of the tool's properties & settings. However, if you hover your mouse over the tool's name, VCarve Pro will now also provide a tooltip telling you what the tool group hierarchy was for this tool when it was added to the toolpath strategy or template. This can be extremely useful for quickly distinguishing between tools in your database that have similar names, but have been grouped according to their properties.



Importing and Exporting tool definitions

Individual tools or complete tool group hierarchies can now be saved to disk using the **Export...** button. Similarly, you can now import previously saved tools, groups or even entire tool databases using the **Import...** button.

Note: VCarve Pro 6 will import database files from VCarve Pro 5, so you can easily add any previously defined tools to your new database. Please note, however, that you will not be able to open VCarve Pro 6 database files in earlier versions of VCarve Pro.






Toolpath Previews & Simulation

The toolpath preview form has a number of additional commands to help with controlling the toolpath previewing process.

Preview Control Simulation

The preview controls provide full video-like playback control of your toolpath. You can use this mode to analyze the tool moves in detail, step-by-step. To begin using Preview Control, click on the Run button.

The Preview Control buttons are summarized below:

				
<i>Run</i>	<i>Pause</i>	<i>Single Step</i>	<i>Run to Retract</i>	<i>Stop</i>
Begins Preview Control simulation	Temporarily halts the tool in its current position and enables the Stop button so you can exit Preview Control mode	Moves the toolpath on by one tool move.	Runs the toolpath to the next retract move, then pauses the tool.	Exits Preview Control mode.

Note: To cancel the process of previewing a toolpath using Preview Control, first click the *Pause* and then the *Stop* buttons.

Preview Visible Toolpaths

The Preview Visible Toolpaths command on the Toolpath Preview form allows you to single-out a subset of toolpaths to be simulated, quickly and easily. Simply isolate the toolpaths you wish to preview by un-ticking the visibility checkboxes of the other toolpaths in the list. The 3D View should now only be displaying the toolpath previews of the toolpaths you are interested in. Click the

button to begin the simulation.

Calculation Edit Boxes

Where appropriate, numerical edit boxes on all of VCarve Pro's forms support simple calculations. Instead of working out a value from a calculation, a sum can be entered directly into the edit box.

x: y:

When the '=' character is entered, VCarve Pro will perform the entered calculation and fill the edit box with the answer.

Special Calculation Characters

As well as the simple numerical calculations, VCarve Pro also supports several special characters to simplify common measurements. These characters are not case-sensitive. When used, VCarve Pro substitutes the character with the appropriate value in the calculation. The following table summarizes the currently supported characters:

Character	Name	Example	Description
W or X	Material Width	w/2=	Half of the material width
H or Y	Material Height	H*2=	Twice the height of the material
T or Z	Material Thickness	t-0.25=	0.25 units less than the material thickness
P	Pi (3.1415...)	P*10^2=	Circumference of a 10 radius circle (πr^2)
I	Inch Conversion		
M	Mm Conversion		
'	Feet	2'+10=	2 feet & 10 inches (34")

Miscellaneous Improvements in VCarve Pro

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- User Interface Improvements
 - New form layout to more easily identify common areas on toolpath forms etc.
 - User editable files (such as postprocessors & shading materials) moved out of program files.
 - 2D and 3D views resize with main window size.
 - Explicit command for importing PhotoVCarve and Cut3D toolpaths.
 - Holding ctrl down with calculate will keep form open
 - 'Intelligent' join-close commands to simplify interface
 - In earlier versions of VCarve Pro, closing a single vector required a separate set of commands compared to joining multiple vectors. VCarve Pro 6 intelligently applies the appropriate operation, according to the selection, using a single command. If the current selection is just a single, open vector then VCarve Pro will apply the 'close' version of the selected command. If the selection comprises several open vectors, VCarve Pro will apply the 'join' version of the selected command.
- Toolpath Improvements
 - An optional border can now be specified on Texturing toolpath form.
 - Toolpath sequencing improvements
 - Machining order for text blocks has been much improved
 - Manual selection of machining order option for profiling, pocketing, drilling, carving
- General Performance Enhancements.
 - VCarve Pro's data files are now compressed automatically on saving, which can provide up to a 50% reduction in file size for complex models.
 - VCarve Pro 6 has had its DWG & DXF file formats updated to improve compatibility with newer versions of 3rd party software, such as AutoCAD 2010.
 - 'shortest path' algorithm option added for machining order