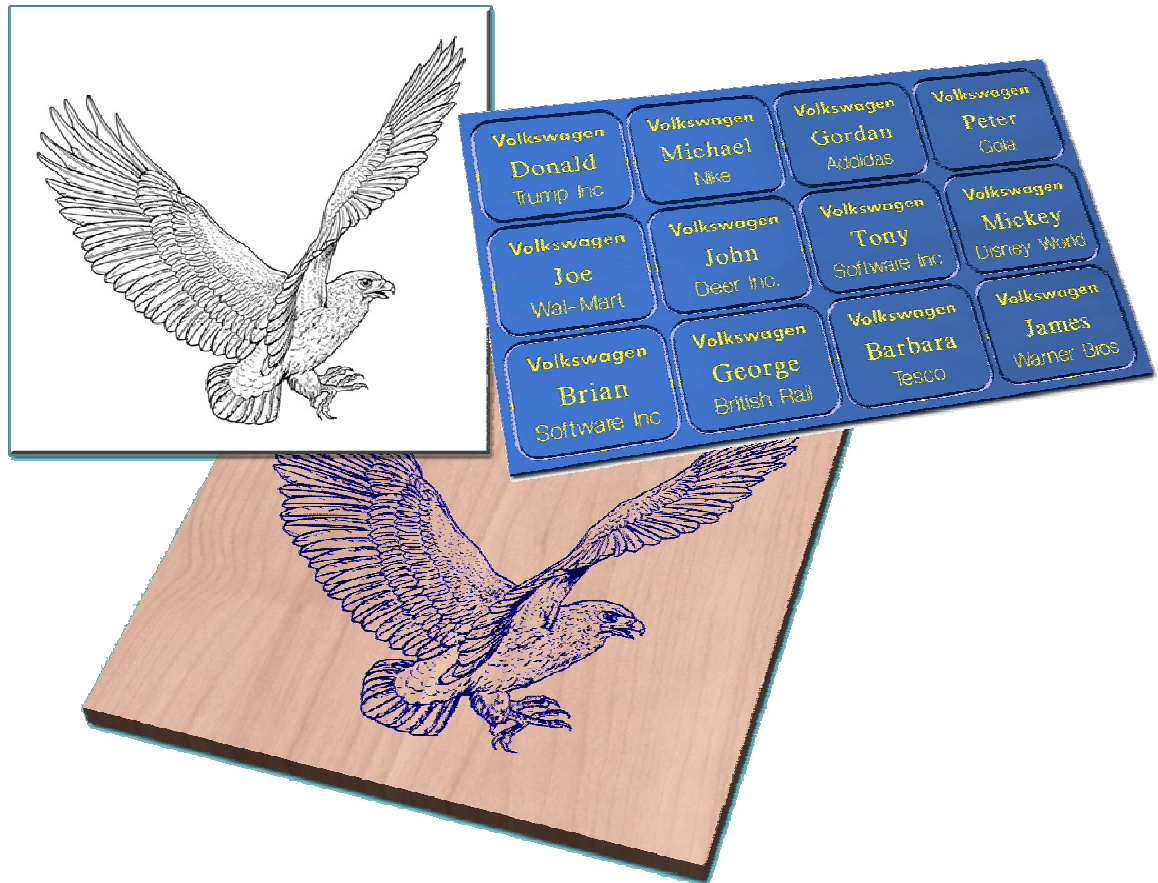


What's New In VCarve Pro 4



Vectric

VCarve Pro

Disclaimer

All CNC machines (routing, engraving, and milling) are potentially dangerous and because Vectric Ltd has no control over how the software described in this manual might be used. Vectric Ltd or any associated Resellers cannot accept responsibility for any loss or damage to the work piece, machine or any individual, howsoever caused by misusing the software. Extreme care should always be taken and the output from the software thoroughly checked before sending it to a CNC machine.

The information in this manual may be subject to change without any prior notice. The software described in this manual is supplied under the terms and conditions of the software license agreement and may only be used in accordance with the terms of this agreement.

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Table of Contents

Installation.....	2
New License Code.....	2
Updating the Tool Database	3
New Interface.....	3
2D View	3
3D View	3
Drawing Tab	4
Layer Controls.....	4
Import Bitmap for Tracing	6
Trace / Vectorize Image Files	7
Text along a curve	10
Interactive Text Arcing	11
Break Text Tool.....	11
Engraving Fonts.....	12
Measuring Tool	13
Block Copy Paste.....	14
Draw Rectangle	15
Copy vectors along a Curve.....	15
Node Editing Options	16
Production Plate functionality.....	17
Toolpaths Tab.....	24
Toolpath List	24
New Quick Engrave / Marking.....	25
New Profile Machining Options	26
Lead In / Out	27
Ramps	27
Pocket Machining with Raster strategy & Ramps	28
Import Cut3D Toolpaths	29
Recalculate All Toolpaths	31
New Cutter Shapes Supported	31
Machining Tabs.....	31
Toolpath Link-up Moves.....	31
Faster Toolpath Calculation	32
The 3D Graphics Engine.....	32
Support	32

Introduction

The new layout and machining functionality developed for this release lifts VCarve Pro from being a decorative toolpath engine, to an industrial strength CNC CAM product that has the tools and flexibility demanded by commercial shops and users.

Installation

VCarve Pro version 4 replaces version 3 and is installed as totally separate product on your PC.

An e-mail will be sent to you with information on how to download and install the new software..

Downloaded the software and select the option to **Install** the software.

Follow the instructions and click the **Next button** to complete the installation process

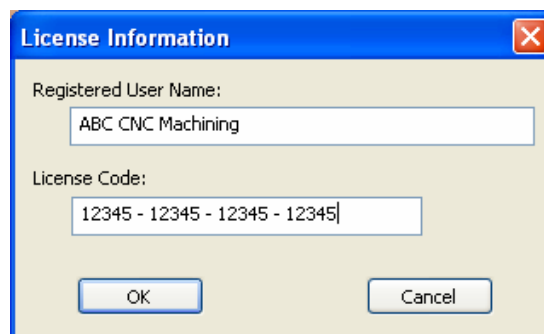
If you experience any difficulties or require assistance please e-mail - support@vectric.com

New License Code

Vectric will also e-mail a new License code to you that authorizes the use of VCarve Pro version 4.

Entering the New License Code,

1. Run the new version 4 software and the following dialog will be displayed asking you to enter the new license code details.



The image shows a screenshot of a Windows-style dialog box titled "License Information". The dialog has a blue title bar with a close button (X) in the top right corner. The main area is light beige. It contains two text input fields. The first is labeled "Registered User Name:" and contains the text "ABC CNC Machining". The second is labeled "License Code:" and contains the text "12345 - 12345 - 12345 - 12345". At the bottom of the dialog are two buttons: "OK" and "Cancel".

2. Enter your User Name and the License Code numbers
3. Click the **OK button** to update your license.

If you have not received a new license code or you need assistance with updating the code, please contact Vectric or your software supplier.

Updating the Tool Database

If you have created your own Tools in the VCarve Pro 3.102 Tool Database, this information can be transferred and used in Version 4.0.

Important - DO NOT Uninstall Version 3.1

1. Install the new Version 4.0 software
2. Open a Windows Explorer Window and navigate to where the original copy of VCarve Pro 3.102 is installed and go into the ToolDatabase folder.

Unless you have specifically installed the software in a different folder this will typically be,

Either C:\Program Files\VCarve Pro 3.1\ToolDatabase

Or C:\Program Files\VCarve Pro 3.1\Exec\ToolDatabase

3. Select the file named,

tools.tool_db

4. **Copy** this file and Navigate to where the new VCarve Pro 4.0 is installed,

Typically C:\Program Files\VCarve Pro 4.0\ToolDatabase

5. **Paste** your original Tool database file into this folder - Replacing the original file

Notes You may wish to make a safe / backup copy of the version 4.0 tool database.

If you need assistance with this e-mail - support@vectric.com

Your tooling will now be available when working in VCarve Pro version 4.0

New Interface

The VCarve Pro interface retains the Drawing Tab on the Left and the Toolpaths Tab on the Right of the screen, but now includes additional icons for the new functionality that make it more powerful and easier to use. This document explains what the key enhancements are.

2D View

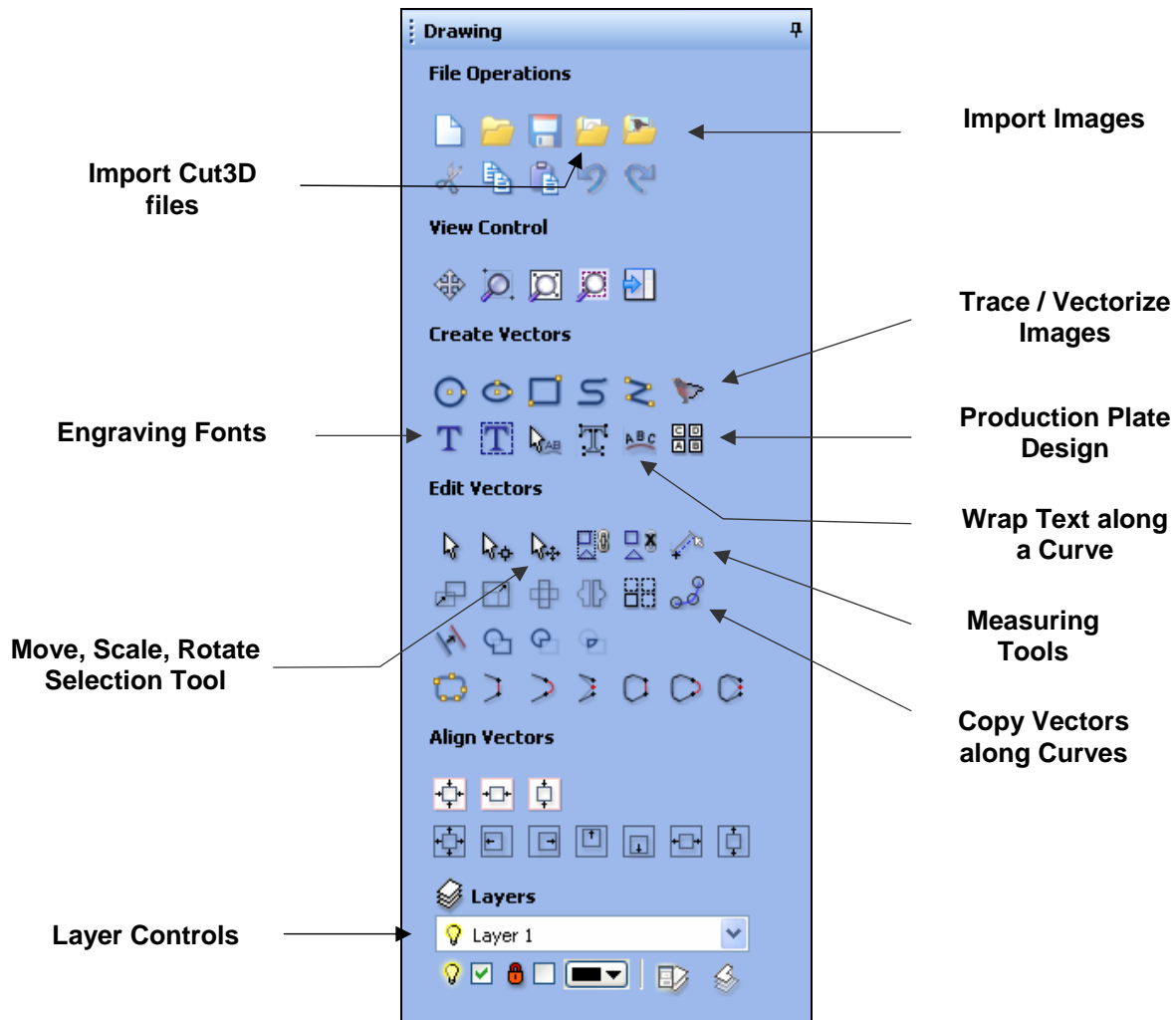
If the main application window for VCarve Pro is changed the 2D view automatically rescales to fit inside.

3D View

The 3D engine has been totally rewritten to make twiddling and working in this view much easier. Previously, when zooming into a region the 3D model would start to twist making it difficult to accurately assess fine detail.

Drawing Tab

The drawing tools have been updated with new icons for the new functionality.

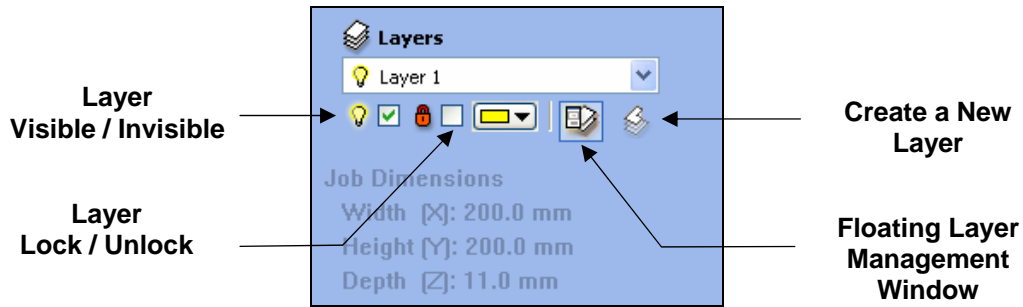


Layer Controls

The new Layer control allows vectors to be assigned to different layers making it much easier to manage and work on complicated designs.


For example, a project that requires decorative VCarving plus pocket machining, drilling and finally profile cut out passes can be setup so the vectors for each machining operation is assigned to different layers. Each layer can be assigned a specific colour and be either visible or invisible, making it much easier to work on complex designs. Being able to quickly and easily turn layers on or off makes selecting and viewing elements in a project much easier.

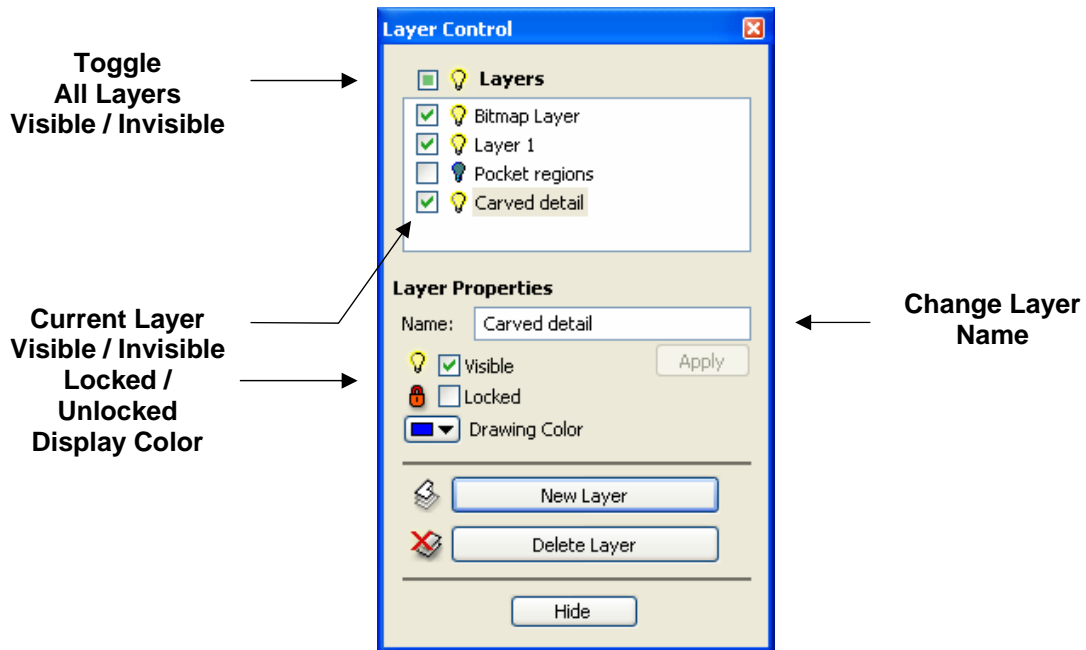
The Layer controls are positioned at the **Bottom of the Drawing Tab** on the left side of the interface.



Layers can be,

- Created and Deleted
- Renamed
- Displayed in a specific colour
- Made Visible or Invisible
- Locked / Unlocked - Locked layers cannot be selected


The **Layer Control Manager**  makes it very easy to work with layers and gives access to all of the control options. This window can be left open while working and dragged and resized as required.

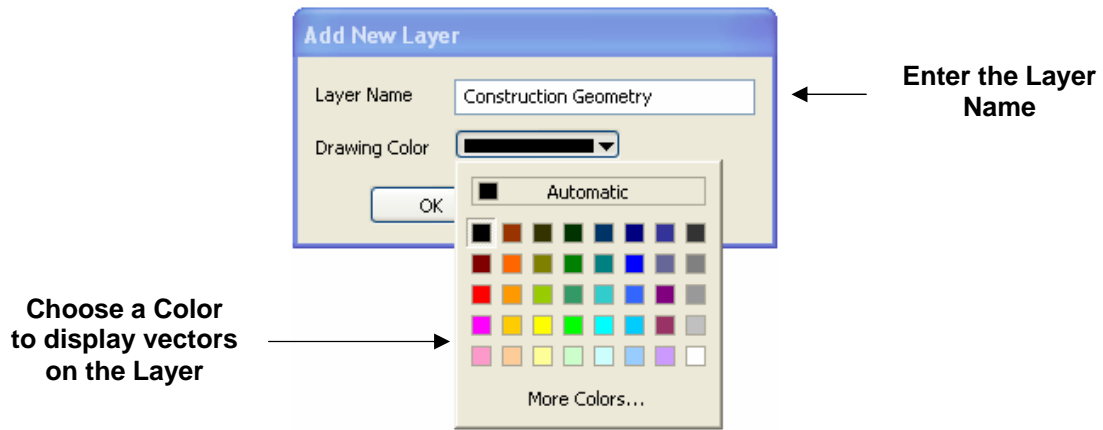


Floating Layer Manager Window

Notes Imported DXF files retain the layer and colour properties from the original file.

Imported images (jpg, bmp, gif, png, tif) are automatically placed on a layer called **Bitmap Layer**. This allows images to quickly and easily be turned off in the 2D view when they are not required. Images can also be moved onto another layer if required.

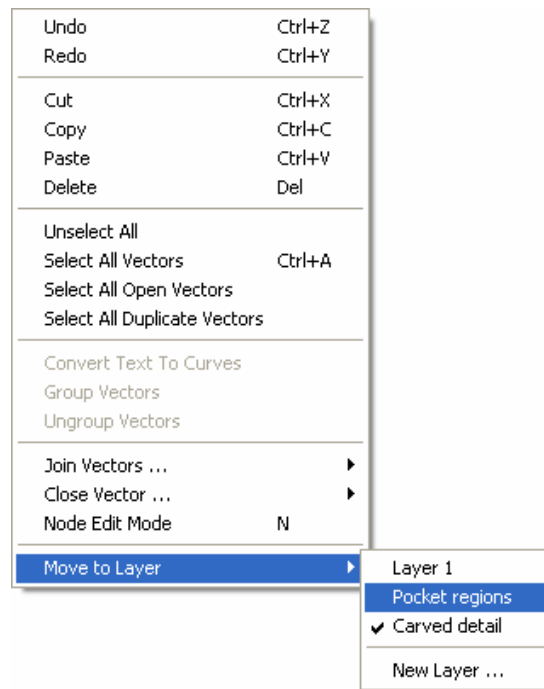
New Layers can be added using the **Create New Layer** button . The dialog for adding the new layer is displayed with options to specify the name and colour of the vectors on the new layer.



Vectors on any layer can be **Moved** onto another layer using the **Right Mouse menu** or using the layer control manager. The quickest way to move vectors from one layer to another is to use the Right mouse button.

Select the vectors to move

Click the **Right Mouse button** and select **Move to Layer** and select the required option.



Moving vectors to another or new layer

Import Bitmap for Tracing

Colour and black & white image files can be imported, interactively or precisely positioned and scaled and then automatically traced or sketched over to create vectors for machining boundaries.



The **Import Image** option is available from the **Main File menu** or from the File Operations menu on the Drawing Tab.

File types that can be imported are - **BMP, JPG, TIF, GIF, PNG**

Unselected images are displayed 'washed-out' in the 2D window and selecting an image switches it to be displayed in full color.



Selected image

Unselected 'washed out' image

Clicking with the **Left mouse button** selects the image and the complete image becomes fully visible.

Clicking **Twice** with the **Left mouse** button (or selecting the new Move, Scale, Rotate selection cursor) on an image starts the **Transformation mode** that allows the image to be interactively dragged / moved and scaled using the cursor. The standard Move, Scale, Mirror tools can also be used with images.

Note Images cannot be rotated

Imported images are placed on a layer named **Bitmap Layer** by default. Images can also be moved onto any other layer if required as well as being made visible / invisible using the layer control tools.

Trace / Vectorize Image Files

Machining image files is now much easier and faster using version 4.0 - no need for InkScape or Corel Trace.

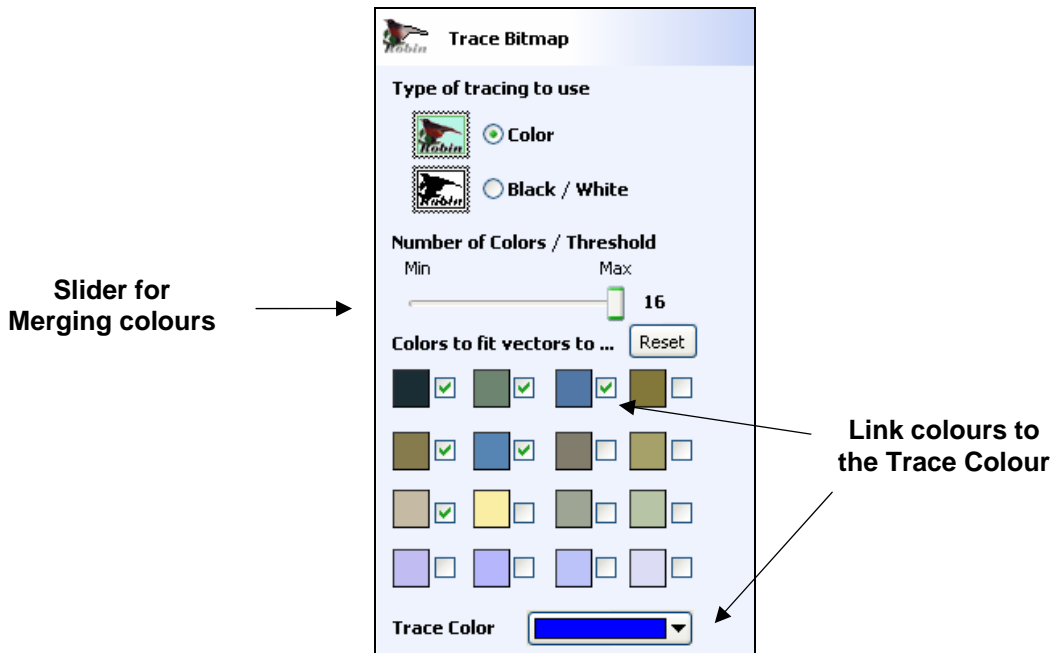


Images can be **Imported** and **Traced / Vectorized** using the new **Fit Vectors to Bitmap** option that automatically creates vector boundaries around regions in the selected image.

Colour or black and white images can be imported and traced.

Working with Colour Images

Colour images are automatically reduced to 16 colours and an interactive slider allows the visible number of colours to be set as required. Colours are merged with the closest match.



Tracing Colour images

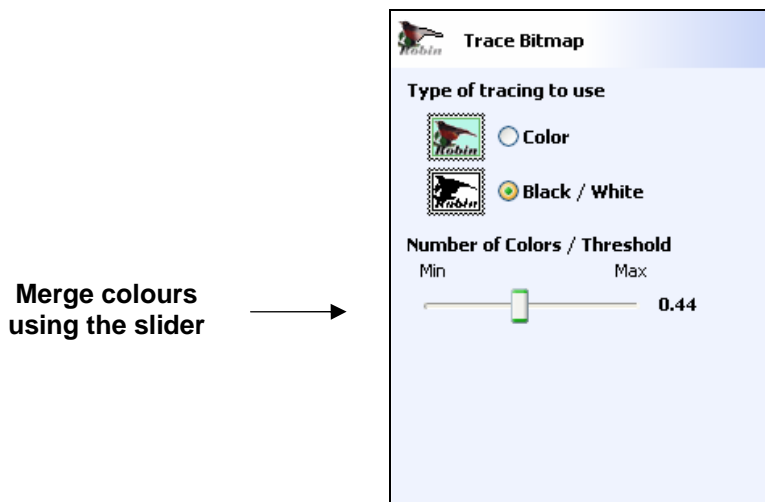
Colours can be temporarily linked together by clicking the check boxes next to each of the colours displayed. Linking colours changes the colour displayed in the 2D view to the selected **Trace Colour**. This is very useful for merging similar colours together to allow complete regions to be traced.

If a new Trace Colour is selected the linked colours are displayed using this colour in the 2D view.

The **Reset button** unlinks all the checked colours and the image displayed in the 2D view reverts back to the original 16 colour image.

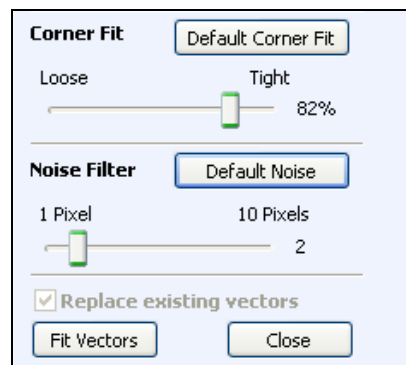
Working with Black & White Images

When working with Black & White images the slider can be used to change the Threshold and merge the levels of gray between all white (min) or all black (max).



Black & White images

When the image displayed in the 2D view has been colour reduced / linked or thresholded to show regions where boundaries can be calculated. Clicking the **Fit Vectors** button automatically creates vector boundaries either around the selected **Trace Colour** or the **Grayscale**.



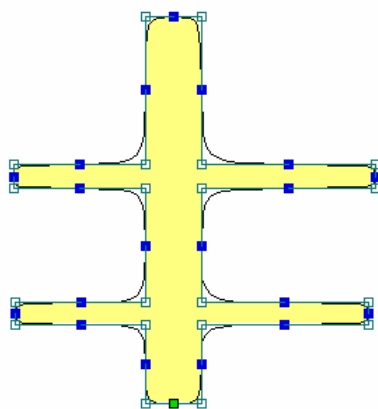
Vector Fitting Properties

The options available on this form control how closely the vectors fit / follow the selected colour boundaries and these can be modified to obtain improved results.

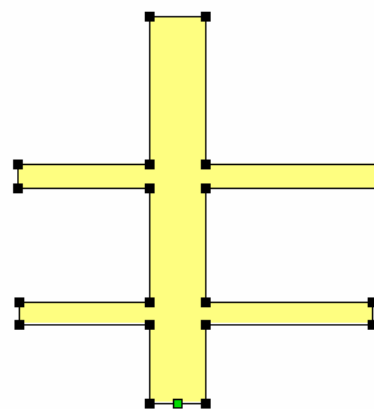
The **Corner Fit** control determines how accurately the vectors are fitted to the corner edges in an image.

Loose will create curves that may not follow corners very precisely but will create smooth free-flowing vector boundaries with few nodes.

Tight inserts nodes to ensure the vector accurately follows the colour boundary, to create sharp detail.



Loose Fit



Tight Fit

When **Replace Existing Vectors** is selected, clicking the Fit Vectors button will delete the last set of calculated vectors with the new vectors. This is very useful as it allows the settings to be modified and a new set of vectors calculated to see what the results will look like without ending up with lots of duplicates

Un-checking **Replace Existing Vectors** will add a new set of vectors every time the **Fit Vectors** button is clicked. This will typically result in unusable duplicate vectors.

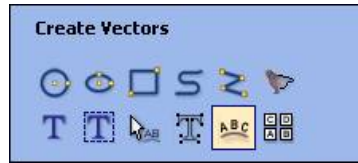
When using the **Trace Colour** option it's sometimes useful to link a region of colours together, fit vectors and then link a new region or colours together, un-check the replace existing vectors option and fit another set of vector boundaries.

The **Noise Filter** slider controls the minimum size / block of pixels that are traced / vectorized, preventing small unwanted vectors / noise being created

For example, if an image contains single or very small clusters of pixels that aren't needed for machining the design. Using the noise filter slider set at 4 pixels will ignore 2 x 2 or smaller pixel clusters.

Text along a curve

A single line of Text can be fitted to any open or closed vector curve with options for controlling the size and position of the text.



Select the Curve and holding the Shift key select the text to fit to the curve. The options are,

Space the Text along the curve →

Align the Text along the curve →

ABC Text On A Curve

Select a SINGLE LINE of text and the curve to wrap it onto.

Text Size

Maintain text size

Scale text to fill curve

10% 100%

Text Spacing

-50% | 300%

Text Position

Above Curve

On Curve

Below Curve

Text on other side

Offset Distance inches

Text Alignment

Left

Middle

Right

Align to Curve

Keep Vertical

Retain the original Text size or Scale it to fit the selected curve

Position the Text relative to the curve

Offset the Text relative to the curve

Align the Text characters relative to the curve

The Text fitting options,

Wrap above, below and on the line with a specified offset if required

Stretch to fit or keep size

If stretching limit percentage of curve stretched to

Align to curve or keep vertical

Justify left, centre or right

'Stretch' spacing of text

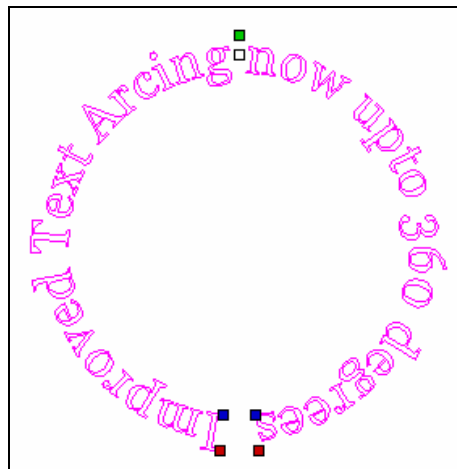
Put text on either side of the line

Keep trying options and pressing apply – previous setting is 'undone' so only one wrap operation left on undo stack

Note When using a closed vector the text is aligned relative to the Start Node. This position can be changed using the Node editing tools

Interactive Text Arcing

A Single line of Text can now be interactive arced through 360 degree (previously 180 degrees) using the Edit Text Spacing and Curve selection tool.

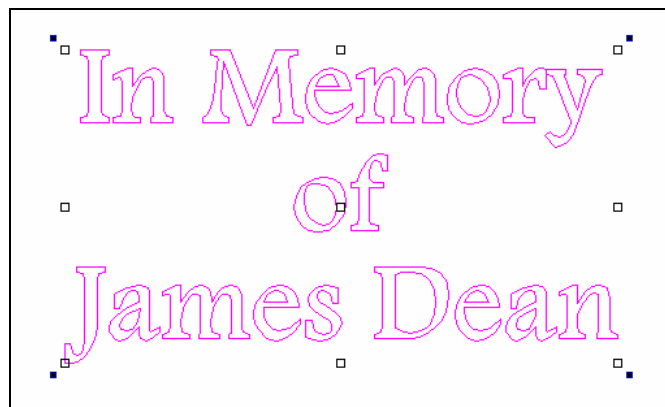


Click on the **Green Handle to arc** the text and drag the **Blue Text Handles** allows to increase the arc angle.

Break Text Tool

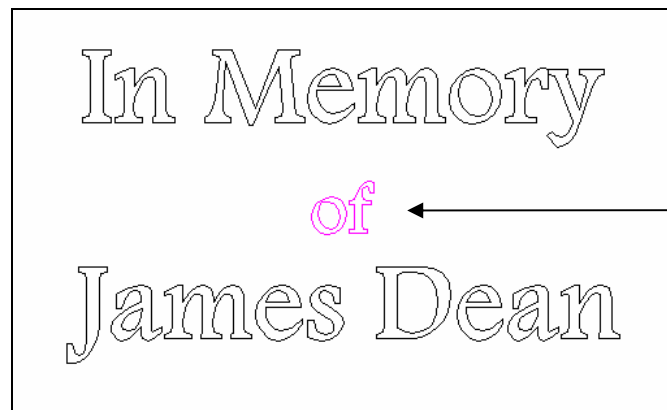
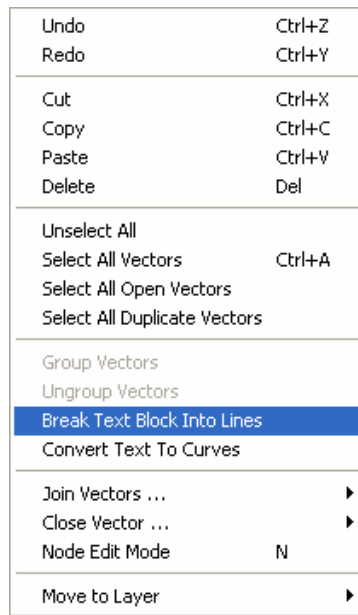
A block of multiple lines of text that has been added using either of the 2 text entry modes - Text at a specific height or Text scaled automatically scaled to fit using the Auto Layout option. Can be broken into separate lines of text so each line can then be edited independently.

This option is available from the **Right-hand mouse button**.



Single block of 3 text lines

Using the **Right hand mouse** button select the option - **Break Text Block into Lines**



**Each line of Text
can then be edited**

**Reduced font size
etc.**

Text separated into separate lines can then be edited as required.

Engraving Fonts

A new set of single and multi-line engraving fonts has been added for fast and efficient engraving of nameplates and badges etc. These are often referred to as 'stick' fonts and the tip of an engraving cutter is used to engrave or diamond drag (mark) on the selected lines.

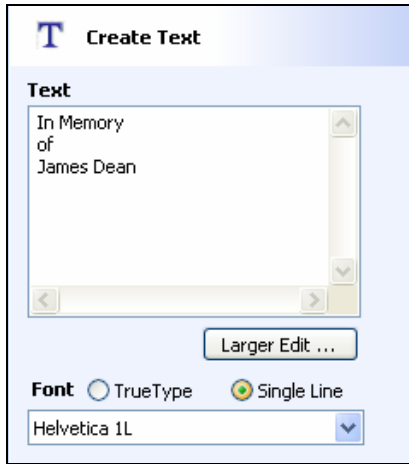
Note These engraving fonts are created from 'open vectors' and can only be machined using toolpath strategies using the option to cut On the lines

Quick Engrave = Outline

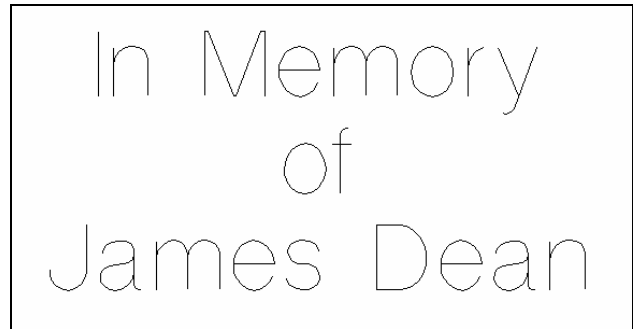
Profile Machining = On

The Engraving fonts **cannot be used** for VCarving, Pocket or Quick Engrave = Fill pattern.

The new fonts are available when using either of the 2 Text entry modes. Simply check the radio button to list the Single Line fonts as shown below.



Single Line Font list



Single Stroke Engraving Font

Measuring Tool



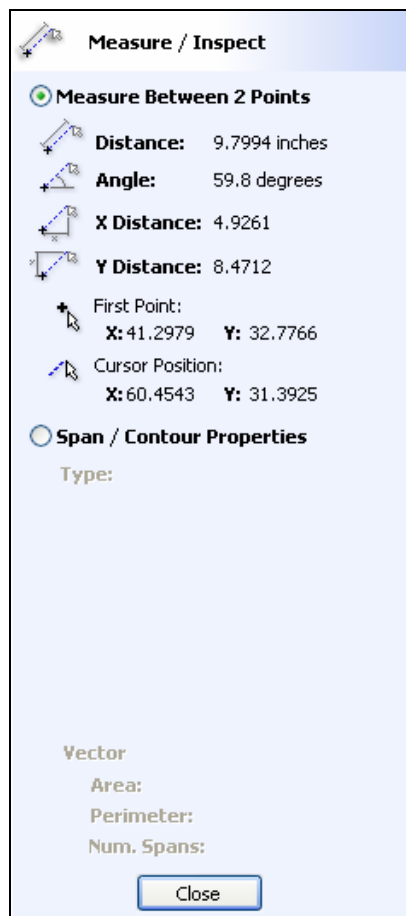
The new interactive **Measuring Tool** is used in the 2D view to check the size and position of objects.

The default mode is to **Measure Between 2 Points**.

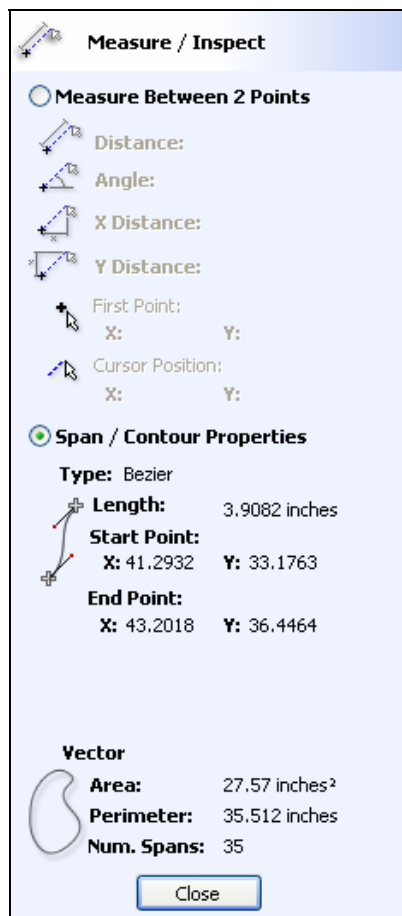
Place the cursor at the point to start measuring from and click the Left mouse button

Move the cursor to the point to measure to and click Left mouse button.

Distance between 2 points



Distance between points



Properties of the selected vector

Properties of the selection

Selecting the **Distance between 2 points** displays,

- Distance, Angle
- X Distance, Y Distance,
- Cursor XY coordinates
- Snapping onto underlying nodes

Selecting the **Span / Contour Properties** option calculates the,

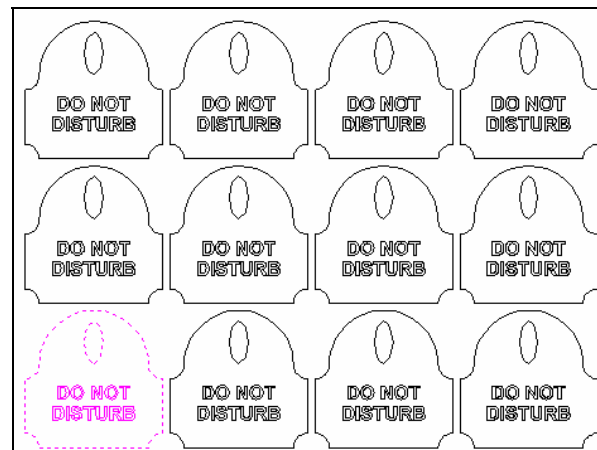
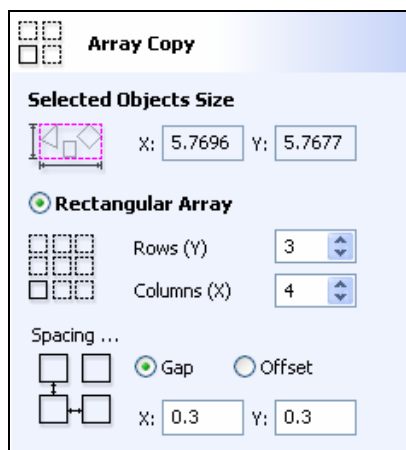
- Selection type - Line, Arc, Bezier
- Length, Start and End coordinates
- Radius and Center Point
- Area, Perimeter and number of spans

Block Copy Paste



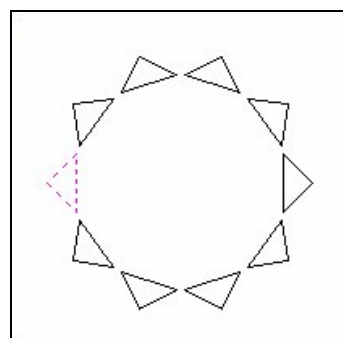
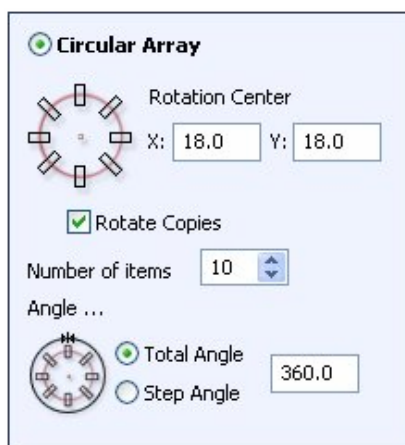
Multiple copies can quickly and easily be created using the Copy Vectors in a Linear or Circular Array

Linear Array creates rows and columns of pasted objects.

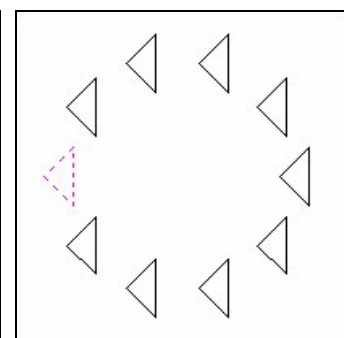


The example above shows a sign blank copied to create a 3 x 4 array = 3 Rows x 3 Columns with a Gap of 0.3" between each sign blank.

Circular Array rotates the pasted objects around an XY coordinate position.




Rotate Copies selected



Rotate Copies not selected

Draw Rectangle



The Draw Rectangle form  has been enhanced to include the option to create filleted corners.

Corner Type

Square

Radiused External

Radiused Internal

Radius inches

Internal Radius

Corner Type

Square

Radiused External


Radiused Internal

Radius inches

External Radius

Copy vectors along a Curve



A selected vector or Group of vectors can be copied along any number of Curves . This technique is often used by sign makers for creating holes around shapes that can then be drilled and LED's then fitted into the holes.

Copy Along Vectors

Copy object
Select object to copy followed by one or more vectors to create copies along.

Copy Circles
Diameter inches

Specify ...

Distance between copies
 inches
 Force even spacing

Number of copies

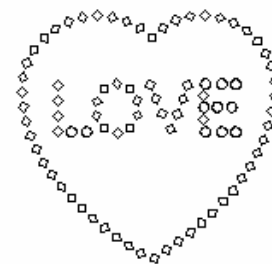
Align vectors to curve
 Create copies on new layer

Any selected vector or group of vectors can be used

Circles can be specified

Control over the distance or number of copies

Additional control options



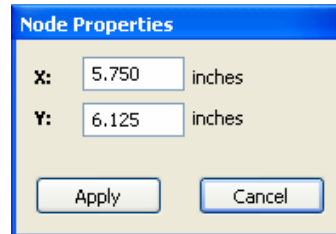
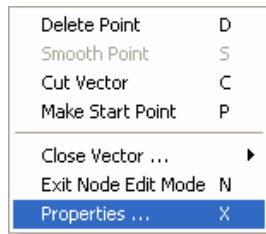
Select the vector to copy along the curve or specify the required circle diameter, then holding the **Shift key** select the curve or curves to paste the vector along.

Node Editing Options

Additional Node Editing functionality has been added to make fixing and positioning geometry even easier and more accurate.

Accurate Positioning

The precise coordinates for a Node can be specified by **placing the cursor over a node** and clicking the **Right mouse button** and selecting the **Properties** from the menu or pressing the **X** key.



Automatic Alignment

Multiple nodes can be aligned horizontally, vertically or simply in a straight line between the start and end nodes using keyboard shortcuts.

In Node Edit mode (N) select the multiple nodes to align and press,

X = Align vertically

Y = Align horizontally

L = Delete intermediate nodes to leave a single straight line

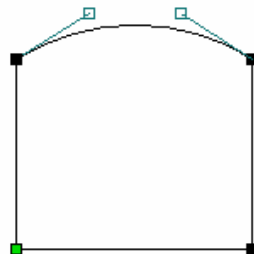
Smooth Blend Bezier to Line

A new Node editing option for creating a smooth blend between a bezier curve and a line has been added using a combination of the right-hand mouse and the keyboard

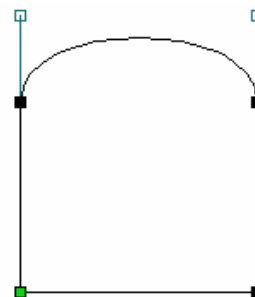
Place the cursor over the node where the bezier and line meet

Hold the **Ctrl** key and click the **Right mouse** and select **Smooth** option

**Discontinuities
where the bezier
span and line meet**



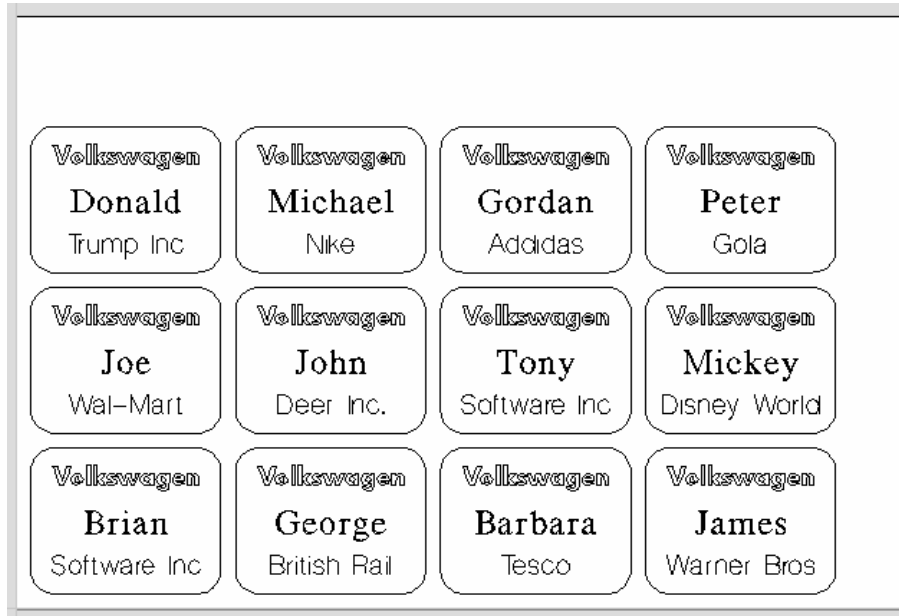
**Smooth blend where
the bezier span and
line meet**



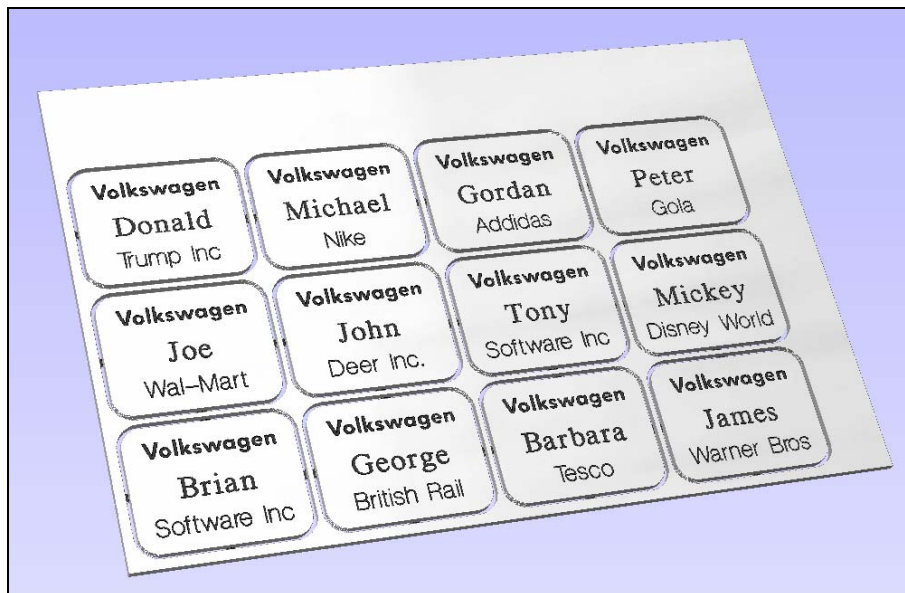
Production Plate functionality

The Production Plate functionality is used when multiple identical badges or plates need to be engraved with different content such as people's / company names. The data needs to be available as a text / database file that contains all the names etc. required on each badge. By setting up a master template that represents the finished badge, all of the additional badges can then be engraved using this for the format and placement.

This functionality is typically used by engravers making badges from a database file supplied by a customer, but could also be useful for making nameplates for hotel rooms with consecutive numbering.



Multiple Badges automatically designed ready for engraving



3D Preview of toolpaths for engraving the badges

The general procedure for using the Production Plate functionality is described below.

1. Draw and Setup the Master Template

Create a New job and specify the **Material Size = the Sheet size** the badges will be engraved from.

For example you may have 300mm x 200mm (12" x 8") sheet of plastic laminate.

Draw and layout the badge / plate at the required size and using the Vector drawing and Text Tools add variables where imported data / text is required.

Variables are defined using **double exclamation marks !!** at the start and end of the variable name.




Master Template for the plate / badge

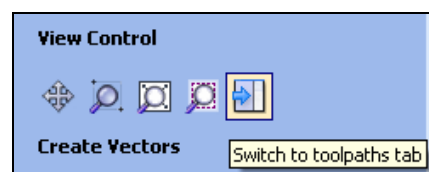
Notes Logos, borders and graphics etc. can also be imported and added to the template.

The Draw Text within a Box to Auto Text Layout and ensure imported text is always sized to fit on the badge.

2. Calculate Toolpaths

When the Master Template has been drawn open the **Toolpath Tab** on the right side of the interface.

From the **View Control** section click on the icon to **Switch to the Toolpaths Tab**  that closes the left hand interface and opens the toolpath options on the Right Side of the screen.



This automatically **closes** the **Drawing Tab** and **opens** the **Toolpath Tab** on the **Right** side of the screen as shown below.

Select the different elements in the template design and calculate the required engraving toolpaths for each part of the badge design.

For example, calculate a Quick Engraving toolpath for the text and logos and a separate Profile cut-out toolpath around the outer edge to cut out the design.

Quick Engrave Toolpath with Fill patterns for logos and True Type fonts



Quick Engrave Toolpath with Outline pattern for the Single stroke engraving fonts

Notes The Profile cut out toolpath can also include Tabs and these will be added to each of the badges holding them in place if required.

Toolpaths are optional and Production Plate functionality can be used to simply create the necessary vectors and text etc. for a batch of plates.

3. Open the Production Plate window

Select all the vectors that make up the Master Template by clicking and dragging to select the vectors.



Click on the **Production Plate** icon to open the form and specify the settings required to lay the badges / plates onto the for the Template

Material Sheet Size →

Margins from the edge of the material sheet →

Spacing between each badge / plate →

Optional →

Plate Production

Sheet Size
 Width inches Height inches

Plate Size
 Width inches Height inches

Sheet Margins
 Top
 Left Right
 Bottom
 Equal Margins

Spacing

Number of plates
 Number in X Number in Y Auto calculate

Toolpath Options
 Create toolpaths

Badge / Plate size is automatically calculated from the template selection

The total number of plates that can be cut from each sheet is based on the Plate size and specified margins & spacing

The size of the selected Template and the number of badges / plates that can engraved from each sheet is displayed on the left side of the Production Plate form.

4. Import the Data to be Merged into the Template

The right-hand side of the Production Plate form is used to specify the data that will be used to engrave onto each plate / badge.

Specify the type of column separator

Import Data File
TXT
CSV

Import the required text / data file and select the appropriate format separator. The separator is the method used in the data file for dividing each set of information into columns. The most commonly used options are,

Comma, Tab, Semicolon and a Space

The data file is commonly created using a spread sheet such as Windows Excel. Use the option to Save As or Export to obtain the required file format that includes the correct Separator information.

Note It's very common for the first row of data in a file to simply show what each of the field names are, and this information is not used on the badge or plate. Checking the box **First row is column names** tells the software to start working with data from row 2.

5. Assign the Variables to the data in the text file

All of the variables specified on the template - text with double exclamation marks !! on either side !! are automatically listed on the form. These variable names are each assigned to a data field (column of text) inside the data file.

Click to select a **Variable name** and select the data field from the imported file that is required on each badge / plate. ie the persons name

Variable Assignment

Variable Name	Type
Name	Text
Company	Text

Variable Assigned To: **Name** Type: **Text**

Number Format: [Counter] [First Name] [Surname] [Company] [Vehicle] [MPG]

Calculate

Repeat for each of the Variable Names listed on the form

Variables can be assigned to **Text** from a data file - Names, Dept etc. or to a **Counter number** that can be formatted and incremented using the Number Format options.

6. Calculate all Badges and associated Toolpaths

If toolpaths have previously been calculated for the vectors in the Master Template, the option to automatically **Create Toolpaths** for each badge / plate is switched on in the bottom left corner of the form.

Number of plates

Number in X: 4 Number in Y: 3 Auto calculate

Toolpath Options

Create toolpaths

Un-checking this option creates the vectors for each badge with the specified spacing and sizing.

Multiple Layers are automatically created if multiple sheets of material are required to engrave all of the badge data from the imported text file. Layer named **Sheet 1** is displayed in the 2D view showing the badges on this sheet.

Each of the Sheets is on a different layer and can be set visible or invisible using the Layer Manager.

Use the Layer visibility options to display each sheet of badges

Layer Control

Layers

- Bitmap Layer
- Layer 1
- Sheet 1
- Sheet 2

Layer Properties

Name: Sheet 1

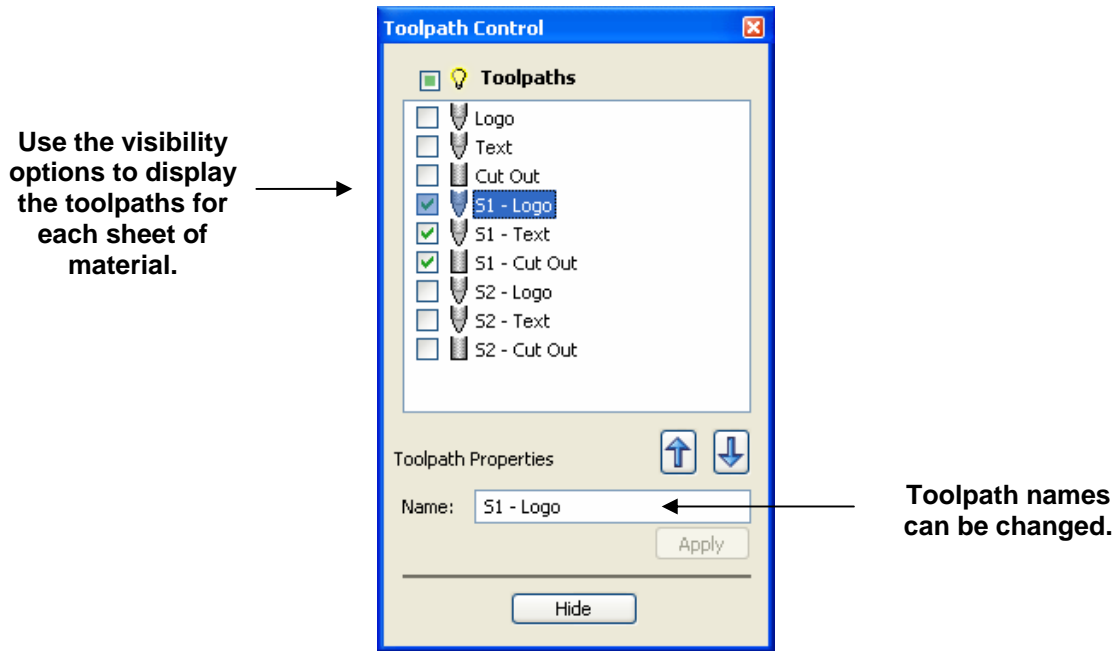
Visible Locked

Drawing Color: [Black]

New Layer Delete Layer Hide

If Toolpaths are automatically calculated a separate toolpath for each operation on each sheet of material is calculated and named using the convention **S1 - Name**. Where the Name is the name of the toolpath previously calculated for the template.

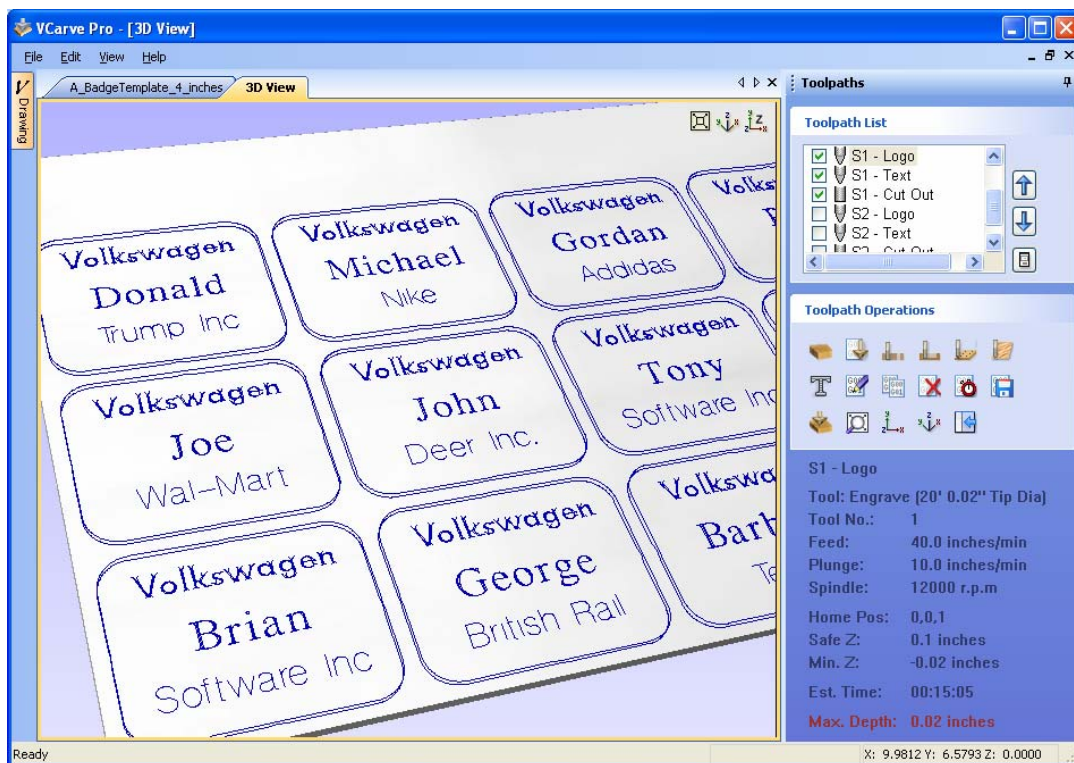
The example below shows 2 sets of toolpaths have been created to engrave onto 2 sheets of material.



Sheet 1 3 toolpaths - Logo, Text and Cut Out

Sheet 2 3 toolpaths - Logo, Text and Cut Out

Note Edit Undo will delete all the layers and toolpaths calculated using the Production Plate operation.

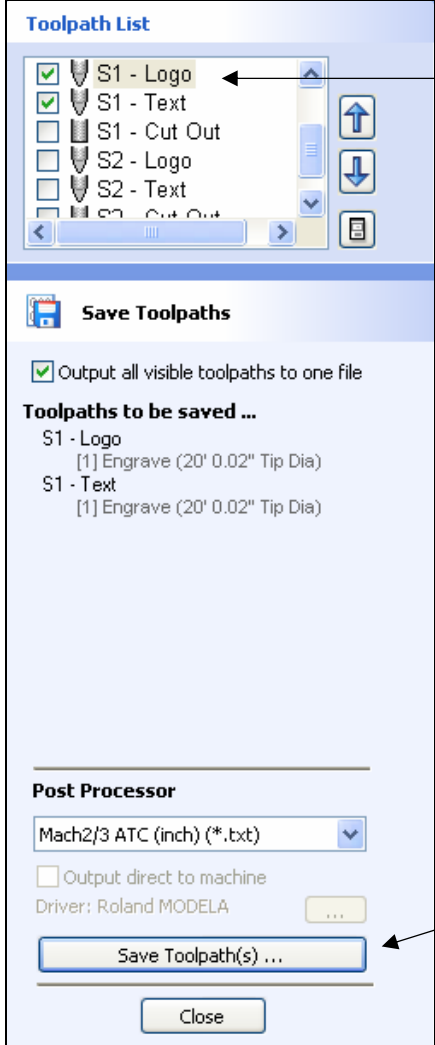


3D window showing the 3 toolpaths for sheet 1

7. Saving / Outputting Toolpaths

After calculating the engraving toolpaths the final stage is to save or output them.

Save / Output the Toolpaths by clicking the **Save Toolpath**  icon.



The screenshot shows the 'Save Toolpaths' dialog box. It is divided into three main sections: 'Toolpath List', 'Save Toolpaths', and 'Post Processor'. The 'Toolpath List' section contains a list of toolpaths with checkboxes: S1 - Logo (checked), S1 - Text (checked), S1 - Cut Out (unchecked), S2 - Logo (unchecked), S2 - Text (unchecked), and S2 - Cut Out (unchecked). The 'Save Toolpaths' section has a checked option 'Output all visible toolpaths to one file' and a list of 'Toolpaths to be saved ...' including 'S1 - Logo [1] Engrave (20' 0.02" Tip Dia)' and 'S1 - Text [1] Engrave (20' 0.02" Tip Dia)'. The 'Post Processor' section has a dropdown menu set to 'Mach2/3 ATC (inch) (*.txt)', an unchecked option 'Output direct to machine', and a driver field 'Driver: Roland MODELA'. At the bottom are 'Save Toolpath(s) ...' and 'Close' buttons. Annotations with arrows point to the checked checkboxes in the list, the 'Output all visible toolpaths to one file' option, the dropdown menu, and the 'Save Toolpath(s) ...' button.

Toolpaths that use the same cutter can be saved into a single file

Select each Toolpath and Save / Output the file

Select the appropriate postprocessor

Click the **Output Toolpaths** button to send the selected Toolpath to the machine.

Important Take extreme care to ensure the material and cutter are setup correctly before running the toolpaths on the engraving machine.

Notes Toolpaths that use the same cutter can be output to the machine together by making the toolpaths **Visible** and checking the option to **Output all visible toolpaths to one file**.

Calculated toolpaths can be edited by either,

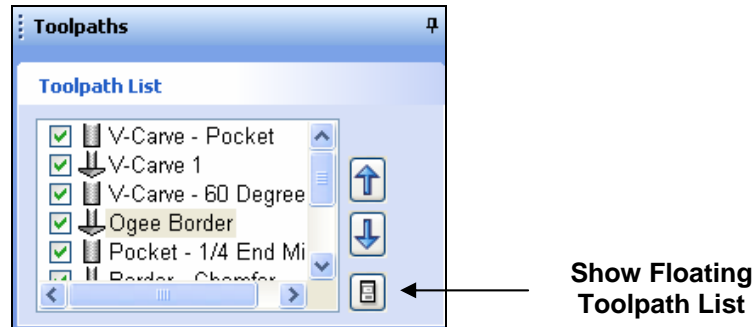
Clicking the **Edit Toolpath** icon  or **Double clicking** on the name of the Toolpath name in the Toolpath List.

Toolpaths Tab

The Toolpath functionality has been significantly enhanced in Version 4 with the addition of powerful and efficient machining strategies and an enhanced, easier to use interface.

Toolpath List

The **Toolpath Tab** has been updated with a new floating **Toolpath Management List** that makes working with large numbers of toolpaths much easier.



The Toggle Toolpath List button opens the Floating List Window

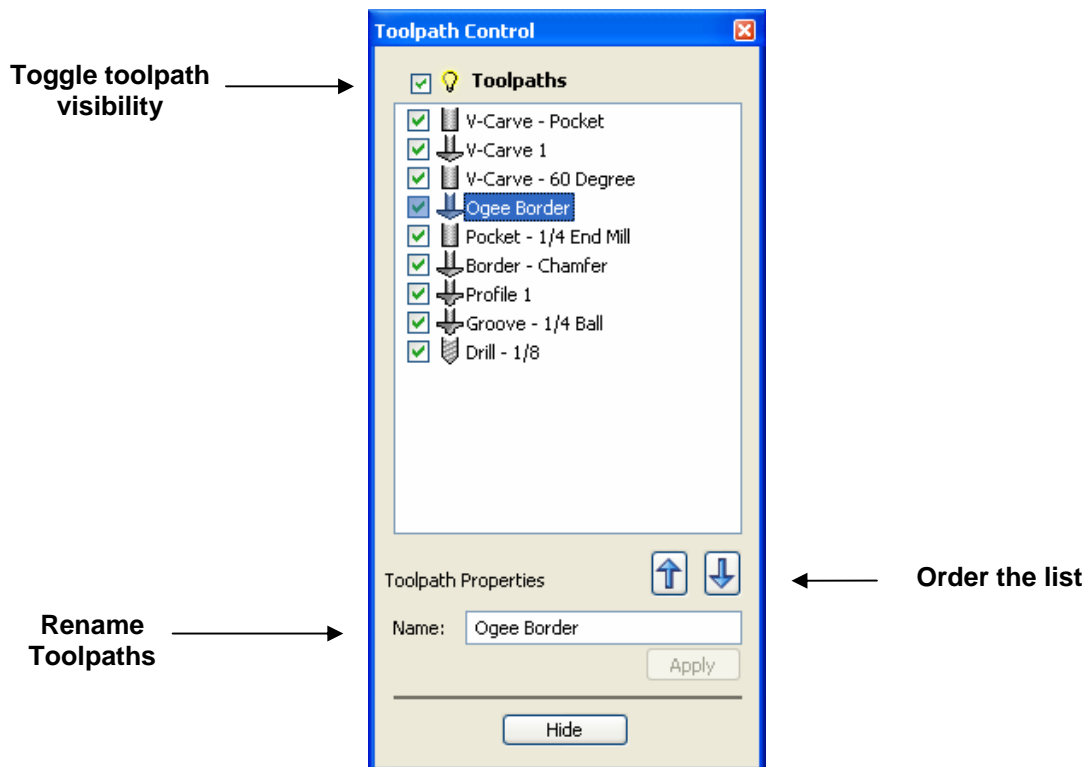
The new floating list provides quick and easy access to the important functionality such as being able to,

Make all toolpaths Visible / Invisible with a single click

Rename toolpaths without having to recalculate them

Order the toolpath list

Work with the floating list continually visible and resize the window as required



Floating List

The Toolpath Operations menu has been updated with the addition of Quick Engraving button.

New Quick Engrave Toolpaths



New Quick Engrave / Marking



The **Quick Engrave** form is used to create a new set of engraving / marking toolpath strategies. These toolpaths are typically used for very shallow engraving / marking onto awards, gifts and nameplates etc. using the tip of an engraving cutter or diamond drag tool.

A screenshot of the 'Quick Engrave' dialog box. The dialog is titled 'Quick Engrave' and contains several sections: 'Tool' with a dropdown menu showing 'Diamond Drag (90 deg 0.02 inches)' and buttons for 'Select ...' and 'Edit ...'; 'Depth / Pressure' with a text input field containing '0.080 inches'; 'Outline / Fill' section with radio buttons for 'Outline' and 'Fill' (selected); 'Stepover' with a text input field containing '0.020 inches'; 'Offset / Hatch' section with radio buttons for 'Offset' and 'Hatch' (selected), and a 'Hatch Angle' input field containing '45.0 degrees' and a 'Cross Hatch' checkbox; 'Use Nose Cone' section with a checked checkbox, 'Tool Depth' input field containing '0.01 inches', and 'Number of Passes' spinner set to '2'; 'Safe Z' and 'Home Position' both set to 'Static'; 'Name' input field containing 'Quick Engrave 1' and a 'Calculate' button; 'Post Processor' section with a dropdown menu showing 'Mach2/3 ATC (inch) (*.txt)', an 'Output direct to machine' checkbox, and 'Driver: Roland MODELA'; and finally 'Save Toolpath(s) ...' and 'Close' buttons.

Select the required cutter / diamond tool

Enter the Depth to Engrave/ Pressure to load the spring


Select the required Fill Pattern

Select this option when using a Nose Cone

Enter a suitable name and click Calculate

After Calculating a Toolpath click the Output button to send to the machine

New Profile Machining Options

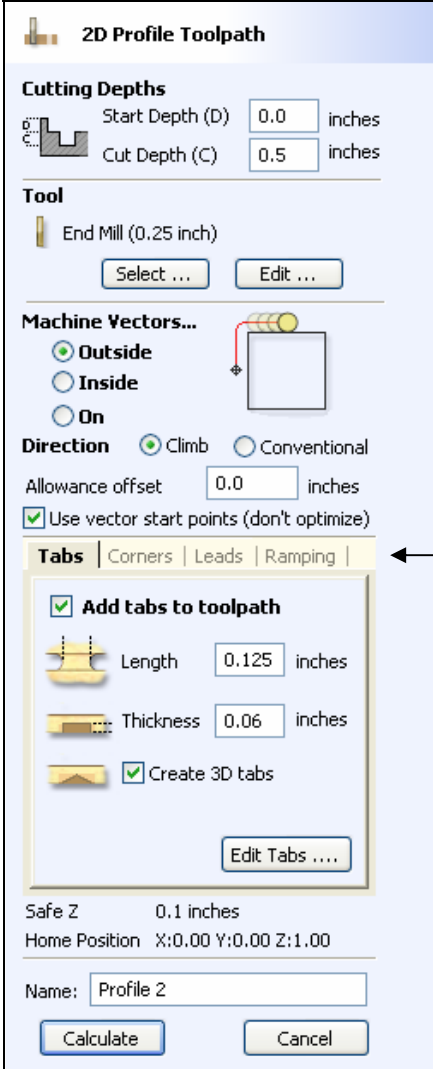
Profile Machining  now includes options that make VCarve Pro perfect for production profile machining where high quality edge surfaces are required.

New options have been added for,

Lead In and Lead Out starts machining off the required edge to prevent dwell marks that are often created when the cutter plunges vertically into the material. The cutter can arc onto the part using a tangential arc or a linear move at a specified angle.

Ramping options make machining hard / tough materials much easier by reducing the vertical Z axis load on the spindle when plunging into the material. Ramping is particularly useful when using low cost spindles / routers that are not designed for vertical loading.

The new Profile form has been enhanced to make it easier to understand and the new options are shown and explained below.

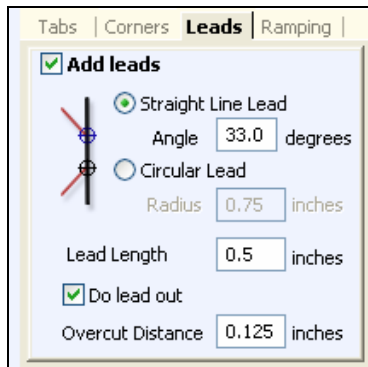


The screenshot shows the '2D Profile Toolpath' dialog box. It is divided into several sections: 'Cutting Depths' with fields for 'Start Depth (D)' (0.0 inches) and 'Cut Depth (C)' (0.5 inches); 'Tool' section showing 'End Mill (0.25 inch)' with 'Select ...' and 'Edit ...' buttons; 'Machine Vectors...' section with radio buttons for 'Outside' (selected), 'Inside', and 'On', and 'Direction' radio buttons for 'Climb' (selected) and 'Conventional'; 'Allowance offset' (0.0 inches) and a checked 'Use vector start points (don't optimize)'; a 'Tabs' section with sub-tabs for 'Corners', 'Leads', and 'Ramping' (selected). The 'Ramping' sub-tab is active, showing a checked 'Add tabs to toolpath' option, 'Length' (0.125 inches), 'Thickness' (0.06 inches), and a checked 'Create 3D tabs' option, with an 'Edit Tabs ...' button. At the bottom, there are fields for 'Safe Z' (0.1 inches), 'Home Position' (X:0.00 Y:0.00 Z:1.00), 'Name:' (Profile 2), and 'Calculate' and 'Cancel' buttons.

Tabbed form for selecting the profile options

New Profile Toolpath form

Lead In / Out

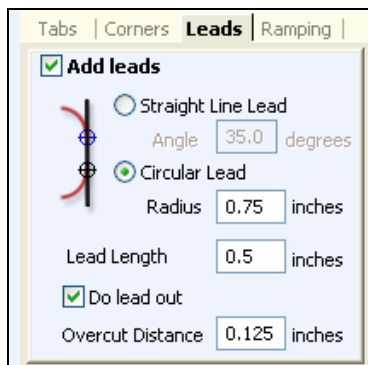


Straight Line Lead

This option creates a linear lead onto the cutterpath using the **Angle** and **Lead length** distance specified.

Un-checking the **Do lead out** option results in no exit lead off the machined edge.

The **Overcut Distance** forces the cutter to machine past the start point and is often used to help produce a better edge quality on parts.



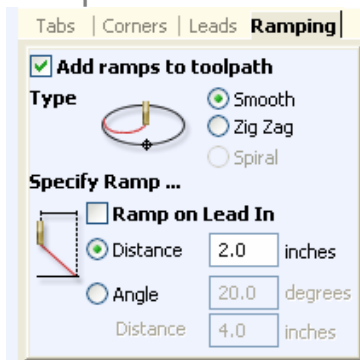
Circular Lead

This option creates a arc lead onto the cutterpath using the **Radius** and **Lead length** distance specified.

Un-checking the **Do lead out** option results in no exit lead off the machined edge.

The **Overcut Distance** forces the cutter to machine past the start point and is often used to help produce a better edge quality on parts.

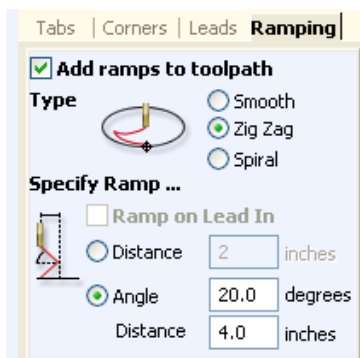
Ramps



Smooth

This option creates a smooth ramp into the material using either the specified Distance or Angle.

The **Ramp on Lead In** disables the distance and angle options and automatically limits the ramp moves to only be on the lead in portion of the toolpath.

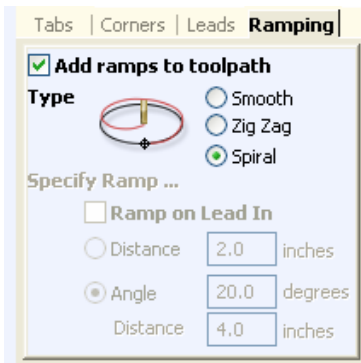


Zig Zag

This option ramps into the material by Zig-Zag backwards and forwards using either the specified Distance or Angle.& Distance.

The Distance option ramps into the material, zigging for the specified distance in one direction then zagging back over the same distance.

The Angle and Distance option is typically used for cutters that cannot plunge vertically but have an entry angle specified by the manufacturer.



Spiral

This option ramps into the material over the complete circumference of the profile pass. The angle is automatically calculated to ramp from the start point to full depth over the perimeter distance around the job.

The rate at which the cutter ramps into the material is determined by the **Pass Depth** specified for the cutter. For example, Spiral Profiling 0.5" deep with a cutter that has a Pass depth of 0.5 or greater will spiral down in 1 pass. Editing the Pass depth to be 0.25" results in the 2 spiral passes around the profile.

Notes

If multiple passes are required due to the Pass Depth being less than the Cut Depth, the ramp moves are applied at the start of each level.

Spiral Ramping is not available when a toolpath has a Lead In specified.

Pocket Machining with Raster strategy & Ramps

The Pocket machining form has been enhanced with Raster Toolpaths strategy and optional Ramp moves into the material.

Allowance to leave on the pocket edge for a final cleanup pass →

New Raster clearance strategy ←

Machining Angle ←

Add Ramp moves to the Plunge regions of the toolpath ←

Import Cut3D Toolpaths

Files from **Cut3D** can now be imported in the same way that files from **PhotoVCarve** and **Vector Art 3D-Machinist** could in the previous version. The toolpaths from these files be imported, positioned, previewed and saved inside VCarve Pro.

Cut3D	.V3D
Vector Art Machinist	.V3M
PhotoVCarve	.PVC

The **Cut3D design** must first be scaled to the required size, toolpaths calculated and the complete file saved ready for importing into VCarve Pro. These files can only be moved and positioned inside VCarve Pro and cannot be scaled.



From the File Operations area on the Drawing Tab, select the **Import** icon and the PhotoVCarve PVC and VA3D-Machinist V3M files can be selected. Alternatively, from the Main Menu click,

File > Import

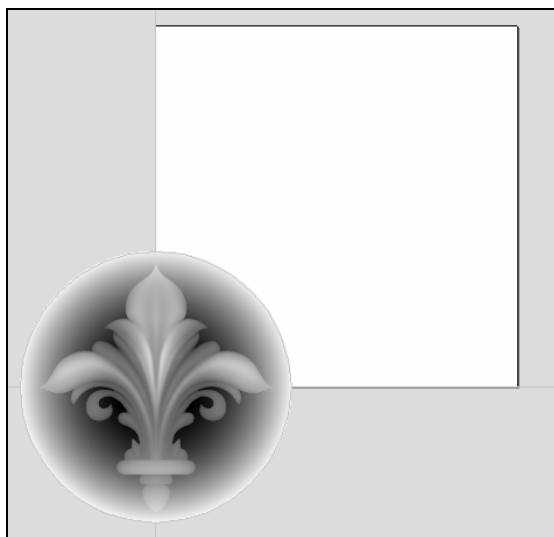
A Greyscale thumbnail of 3D job is drawn in the 2D window with the X0 Y0 origin at the position it was set in PhotoVCarve or VA3D-Machinist. The associated toolpath(s) are also drawn in the 3D window and the names appear in the Toolpath list.

To move the 3D design toolpaths interactively,

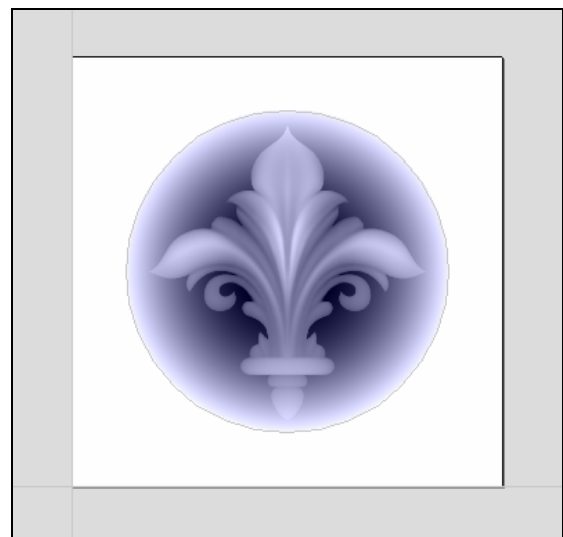
- Open the 2D Window
- Click the **Left mouse Twice** on greyscale image (turns light Blue to indicate it's selected)
- Drag to the required position

The files can also be accurately moved and aligned using the vector drawing tools.

The toolpath(s) are automatically moved in the 3D window to the same XY position as the image.



Origin for the 3D data at X0 Y0




Greyscale image moved to middle of job

Toolpaths for the example above have been calculated with the X0 Y0 in the middle of the 3D design. When imported into VCarve Pro the data is automatically positioned using the same coordinates, which

places three quarters of the design off the job. In the second image the greyscale image has been moved to the middle of the job.

The 2D mirror and rotate drawing tools to can also be used to edit the 3D data set.

3D toolpaths from Cut3D can also be Copied using the Toolpath Operations  making it very easy to use multiple elements from a single design on a job. The thumbnail preview is also copied for each toolpath, making it very easy to position additional copies of a 3D toolpath.

For example, a single design can be copied and mirrored to create Left and Right versions of a 3D design or to place multiple copies of a decorative design in the corners of a cabinet door panel as shown below.



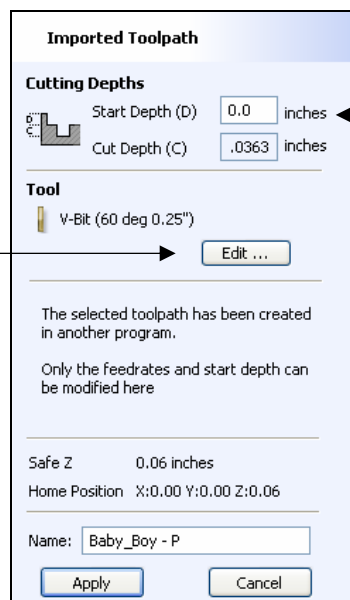
The 4 corner roses are all copied from a single file

Toolpaths for the 3D elements can be previewed along with the conventional VCarved, Engraving, 2D and Drilling toolpaths, and everything saved ready for machining.

Imported toolpaths can also be edited to drop them into the material or to change the cutting parameters - speeds and feedrates can be changed.

Click the **Edit toolpath** icon  or **Double click** on the toolpath name to open the edit form.

The Cutting parameters can also be edited
Speeds and feeds



Imported Toolpath

Cutting Depths

Start Depth (D) 0.0 inches

Cut Depth (C) .0363 inches

Tool

V-Bit (60 deg 0.25")

Edit ...

The selected toolpath has been created in another program.

Only the feedrates and start depth can be modified here

Safe Z 0.06 inches

Home Position X:0.00 Y:0.00 Z:0.06

Name: Baby_Boy - P

Apply Cancel

The Start Depth can be edited

For example, after machining a 0.5" deep pocket a PhotoVCarve design can then be edited to have a Start Depth = 0.5" and this will carve the photograph onto the base of the pocket surface.

Important When using a Cut3D or VA3D-M file that includes multiple toolpaths, you must remember to edit the Start Depth for all of the imported 3D toolpaths.

Note Vector boundaries can be traced around the imported greyscale thumbnail images.

Recalculate All Toolpaths

The option to recalculate all toolpaths after changing the Job or Material size or Editing the Clearance Gap etc. is now possible using the Re-Calculate All Toolpaths. This is a big time saver when a project contains multiple toolpaths.

Available off the **Edit Menu**

Edit > Recalculate All Toolpaths

Note This option does not recalculate all toolpaths imported PhotoVCarve, Cut3D or Vector Art 3D Machinist.

New Cutter Shapes Supported

The Tool Database has been updated to support Radiused End Mill and Engraving cutters plus Diamond Dragging Tools.



Radiused Conical
Engraving



Radiused End Mill



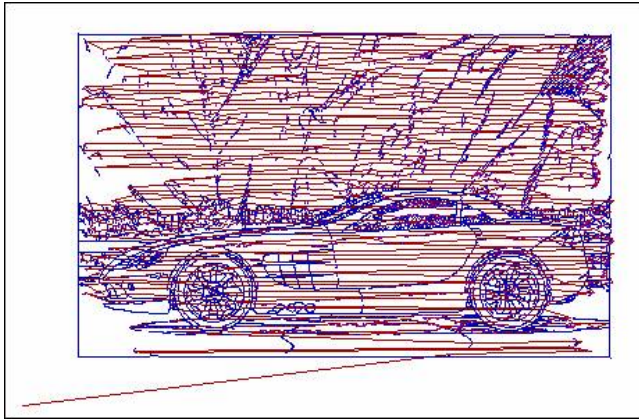
Diamond Drag
marking tool

Machining Tabs

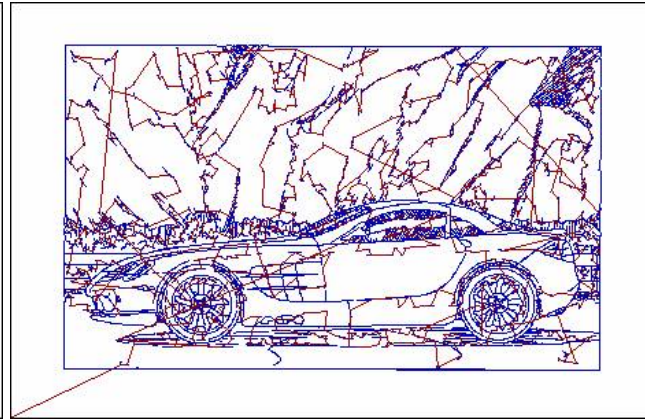
Toolpath moves running over 2D Tabs were previously always cutting at the XY surface cutting speed. This has been changed and the plunge moves at the end of the tab are now at the specified plunge feed rate.

Toolpath Link-up Moves

The algorithm for linking multiple sections of a toolpath has been updated giving a significant reduction in 'fresh-air' moves at the clearance height across the job. Resulting in optimized link-up moves that results in faster machining times.



Version 3



Version 4

Previously wasted time running backwards and forwards at the Clearance Height

Faster Toolpath Calculation

When working with complex designs that include many thousands of vectors, some VCarving calculations would appear to 'hang for a few seconds' while computing the toolpath. The math engine has been improved and now even the most complicated of designs are calculated in seconds.

The 3D Graphics Engine

The 3D Graphics engine has been totally re-written for version 4 and the new 3D view is now much easier to control and work in. Zooming close on an area in version 3 resulted in the job starting to look skewed / twisted, but not in version 4.

Also, switching off the Colour Shaded View disables the perspective drawing and this makes it much easier to review the 3D toolpaths.

Support

If you need assistance or have any questions about the new features in VCarve Pro version 4 please use the following options to contact the Vectric Support Team.

E-mail the Support Team

support@vectric.com

Visit the Vectric User Forum

www.vectric.com/forum