
ArtCAM Express 2013

Getting Started



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Patents

The technique of using a wall-mounted scanner to capture a photographic side profile of a human face, which is then used to create a 3D relief in ArtCAM, is subject to a patent.

Patent No: GB 2 387 731 "Deriving a model from a scan of an object"

The functionality of preparing a 3D relief of the side profile of a human face direct from a photograph in ArtCAM is subject to a patent.

Patent No: GB 2 403 883 "Photo to 3D"

The functionality of the 3D layers used to design and machine an article in ArtCAM is subject to a patent application.

Patent No: GB 2 434 287 "3D Layers"

The functionality of creating a low relief from an imported 3D object in ArtCAM without losing low-level detail is subject to a patent.

Patent No: GB 2 455 966 "Method and System for Generating Low Reliefs – a.k.a. Scan to Low Relief"

The functionality of filling an area with geometric or natural textures using pattern elements and a controlling direction line in ArtCAM is subject to a patent application.

Patent Application: GB 2492225 "Texture Flow"

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Overview


ArtCAM Express is an entry-level 3D machining solution for professional CNC engravers and router users. Designs can be created using ArtCAM Express's comprehensive vector and bitmap drawing tools, its vector and relief clipart libraries, or imported from other graphics packages.

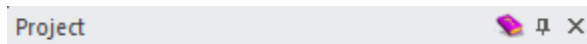
ArtCAM Express handles complex designs with ease and provides flexible machining strategies that are fast, accurate and, most importantly, very reliable. Realistic 3D toolpath simulations can be used to verify all toolpaths, and picture the end product, before sending them to the CNC machine.

Information about ArtCAM Express

You can find information about the features in ArtCAM Express from the following sources:

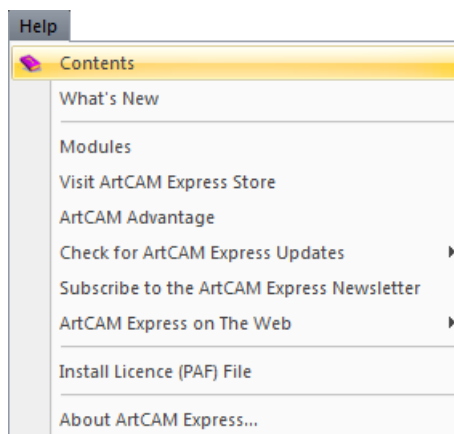
- Inline-help.

Click  on a panel's header to toggle the display of its in-line help.



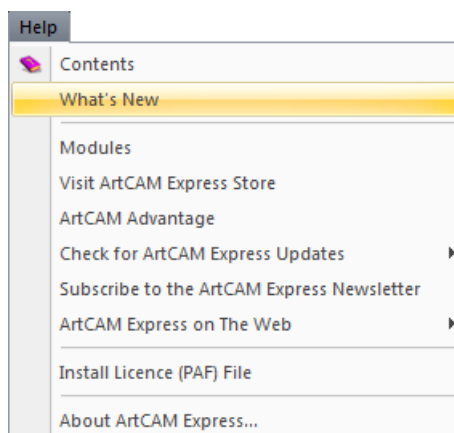
- The ArtCAM Express Reference Help system.

In the **Main Menu** bar, click **Help > Contents**.



- The ArtCAM Express What's New system.

In the **Main Menu** bar, select **Help > What's New**.



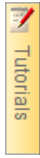
- The **Live!** panel.

Move the cursor over the **Live!** tab in the right docking area:



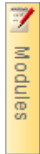
- The **Tutorials** panel.

Move the cursor over the **Tutorials** tab in the right docking area:




- The **Modules** panel.

Move the cursor over the **Modules** tab in the right docking area:



- The **Start** panel.

Click  in the **Other Features** area to display details of new features and enhancements.

- The ArtCAM Express website.

In the **Main Menu** bar, select **Help > ArtCAM Express on The Web > ArtCAM Express Home Page**.

- The ArtCAM Express User Forum.

In the **Main Menu** bar, select **Help > ArtCAM Express on The Web > ArtCAM Express Forum**. You can also access the forum at <http://forum.artcam.com> (<http://forum.artcam.com>).



*If you have not yet registered as a forum member, click the **Register** option on the forum's home page to do so. Registered users are able to download images, example ArtCAM Express models and relief clipart files attached to posts.*

- Subscribe to the ArtCAM Express Newsletter.

In the **Main Menu** bar, select **Help > Subscribe to the ArtCAM Express Newsletter** to send an e-mail requesting subscription to the quarterly newsletter.

Files compatible with ArtCAM Express

You can create a new model by opening a file saved in any of the following formats:

- ArtCAM Model (*.art)
- ArtCAM Relief (*.rlf)
- Windows or OS/2 Bitmap (*.bmp)
- Windows or OS/2 DIB (*.dib)
- Windows or CompuServe RLE (*.rle)
- JPEG Image - JFIF Compliant (*.jpg, *.jpeg, *.jpe and *.jfif)
- CompuServe Graphics Interchange (*.gif)
- Windows Enhanced Meta File (*.emf)
- Windows Meta File (*.wmf)
- Tagged Image File Format (*.tif and *.tiff)
- Portable Network Graphics (*.png)
- Windows Icon (*.ico)
- Drawing Interchange Format, including PowerSHAPE and AutoCAD (*.dxf)
- AutoCAD 2D Drawing (*.dwg)
- Lotus, PC Paint or DUCT picture (*.pic)
- Delcam DGK (*.dgk)
- Portable Document Format (*.pdf)

You can import vector artwork saved in any of the following formats into an open ArtCAM model:

- Adobe Illustrator Image (*.ai)
- Encapsulated PostScript (*.eps)
- Drawing Interchange Format, including PowerSHAPE and AutoCAD (*.dxf)
- AutoCAD 2D Drawing (*.dwg)
- Lotus, PC Paint or DUCT picture (*.pic)
- Delcam DGK (*.dgk)
- Windows Meta File (*.wmf)

You can import triangle models saved in the following file formats into an open ArtCAM model:

- 3D Assembly (*.3da)

- ArtCAM Project (*.3dp)
- 3D Studio (*.3ds)
- Drawing Interchange File (*.dxf)
- Binary or ASCII STL (*.stl)
- Universal 3D File (*.u3d)
- Wavefront Object File (*.obj)
- Delcam Machining Triangles (*.dmt)

You can import surface models saved in the following file formats into an open ArtCAM model:

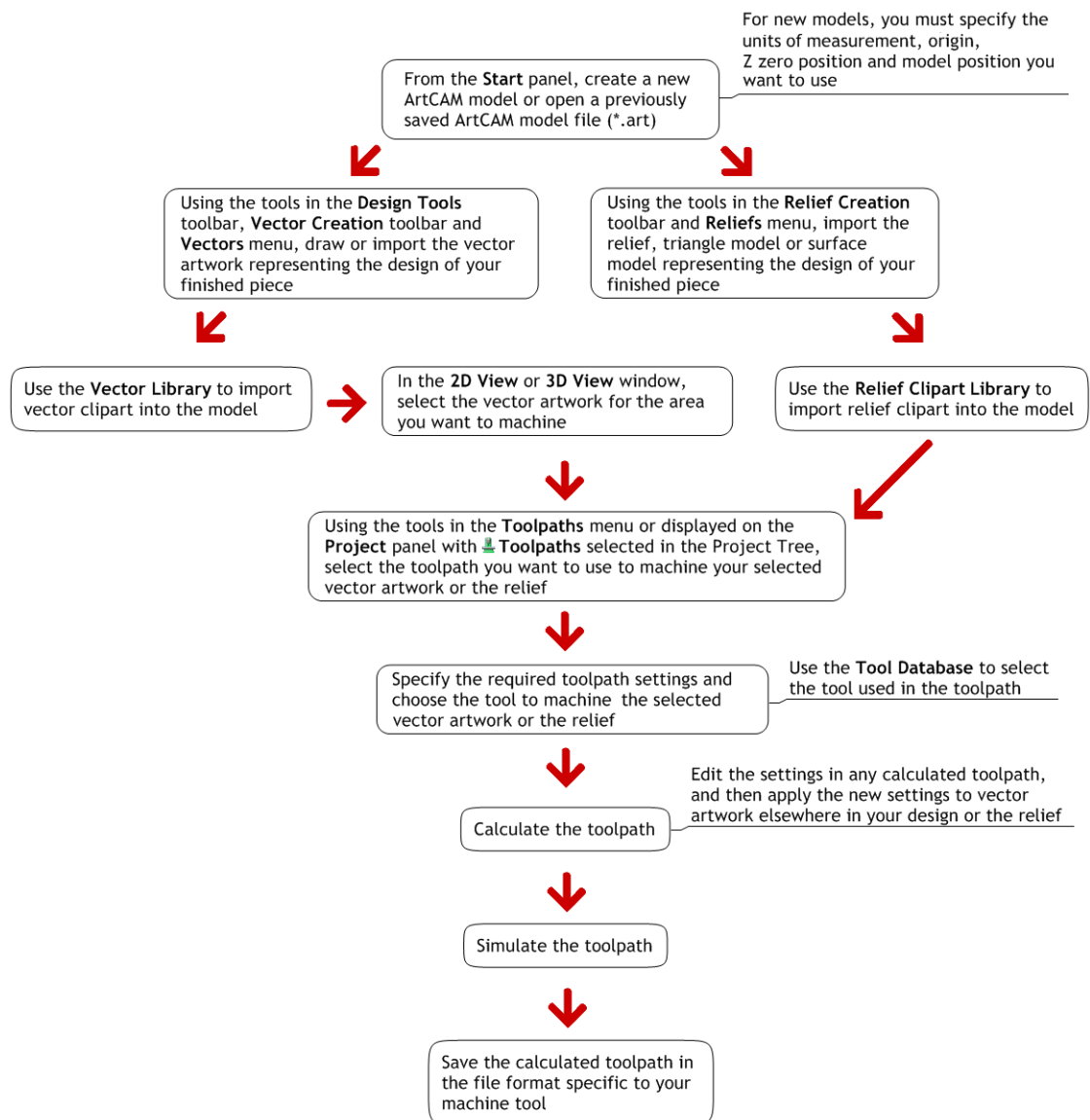
- 3D NURBS Modeller - Rhinoceros (*.3dm)
- Delcam DGK (*.dgk)



You must have Exchange 7.0.1005 or above installed on your computer to import all triangle and surface models.

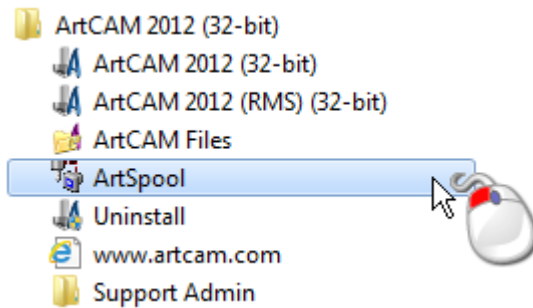
The ArtCAM Express process

The following diagram shows the basic steps involved in turning your ideas into machined pieces using ArtCAM Express:



Using ArtSpool

ArtSpool is an application tool you can use to send toolpath data to your CNC machine tool through a serial cable. It is installed alongside ArtCAM Express:



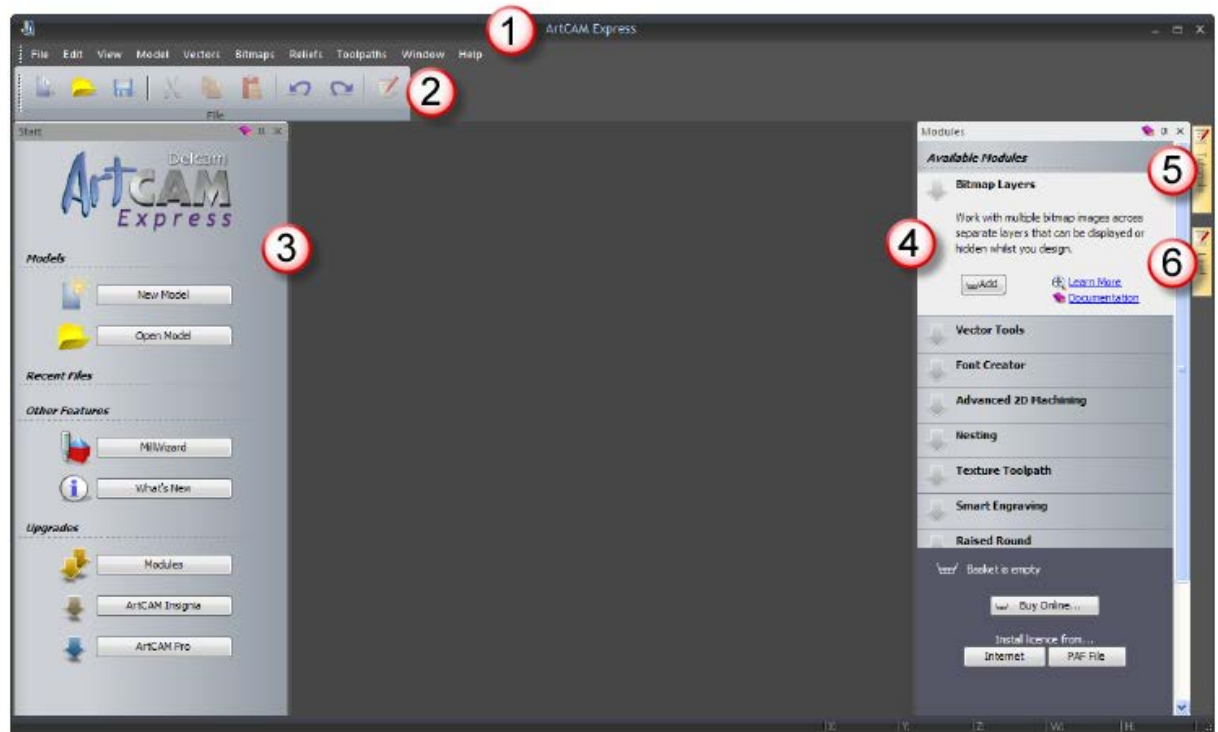
ArtSpool runs as a background task in Windows. This means that instead of your computer being inaccessible for hours at a time processing and sending data to your CNC machine tool, you can continue to use it while ArtSpool handles your machining jobs.

ArtCAM Express layout

The ArtCAM Express screen layout is designed to help you work effectively and efficiently; the layout depends on whether or not you have a model open.

The starting layout

When you start ArtCAM Express, the layout includes six key areas:



- 1 **Main Menu** bar — Select a menu item associated with part of ArtCAM Express's design process to display a drop-down menu of commands. Most of these options are inactive until you open a model.
- 2 **Top docking area** — The **File** toolbar is docked here. This enables you to create and open models.

- ③ **Start** panel — This panel enables you to create and open models. Recent files are listed and can be re-opened. You can also start the **MillWizard** standalone tool, display information about the new features and enhancements in ArtCAM Express, display the **Modules** panel, and upgrade to ArtCAM Insignia or Pro.

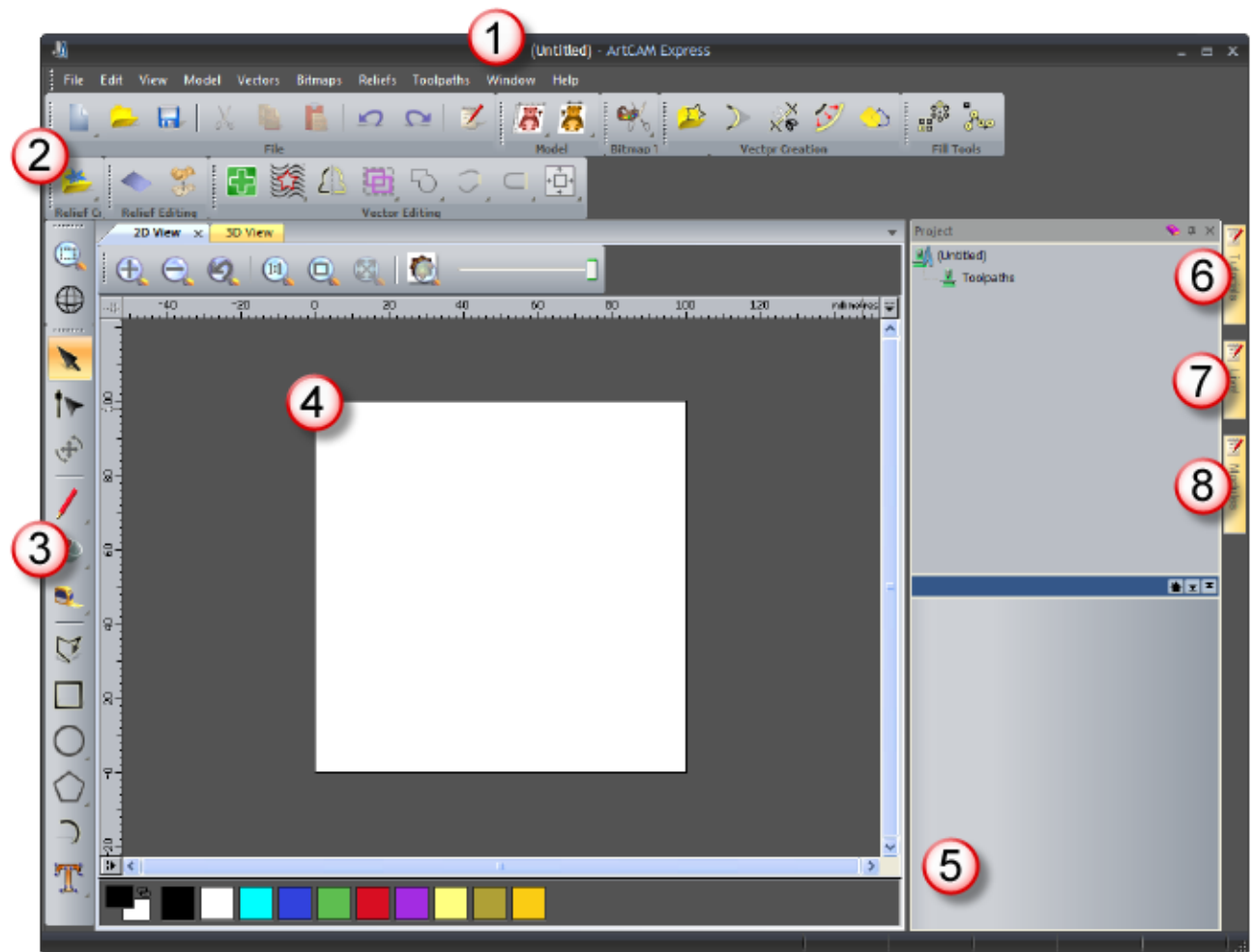


*When a model is created or opened, the **Start** panel is hidden.*

- ④ **Modules** — This panel provides brief information about the modules compatible with ArtCAM Express, and enables you to purchase them.
- ⑤ **Tutorials** — This tab displays a panel that provides information on where to download tutorial packs. Tutorial packs included in your installation are listed.
- ⑥ **Live!** — This tab displays a panel that provides online training and demonstration videos.

The open model layout

When you create a model, the layout includes eight key areas:



- 1 **Main Menu bar** — As described previously, although more sub-menus and commands are active.
- 2 **Top docking area** — This area contains the **File**, **Model**, **Bitmap Tools**, **Vector Creation**, **Fill Tools**, **Relief Creation**, **Relief Editing** and **Vector Editing** toolbars.

One additional toolbar is hidden by default: **Simulation**. When displayed, this is also docked.



*Most of the toolbars' tools are also available from the **Assistant** panel, which is hidden by default so as to maximize the viewing area. When displayed, this panel is docked on the left.*

- 3 **Left docking area** — The **View Manipulation** and **Design Tools** toolbars are docked vertically here. The former enables you to twiddle and zoom, while the latter contains three tool groups: modes, painting and drawing. These groups include many of the most frequently used tools in ArtCAM Express.

- ④ **Viewing area** — The viewing area contains two types of tabbed windows: the **2D View** and **3D View**. These display the two-dimensional vector and bitmap artwork in your model. The **3D View** window also displays the relief, calculated toolpaths, and toolpath simulations. Each window has a toolbar and colour palette.
- ⑤ **Project panel** — This docked panel displays the Project Tree and tools associated with its items. The Project Tree maps the different elements of your model. Its items provide context menus that enable you to create models, as well as to calculate, edit, and simulate toolpaths.



*The most frequently used tools from the **Toolpaths** panel, which is hidden by default, are available from the **Project** panel. When displayed, the **Toolpaths** panel is docked on the left.*

Two panels are hidden by default: **Toolpaths** and **Assistant**. To display hidden panels, right-click anywhere in the top docking area and select the panel you want from the context menu. When displayed, each panel is docked and pinned.

- ⑥ **Tutorials** — As described previously.
- ⑦ **Live!** — As described previously.
- ⑧ **Modules** — As described previously.

Understanding the framework

The ArtCAM Express framework consists of a:

- **Title** bar (see page 12);
- docking area on all four sides (see page 13);
- a viewing area (see page 17); and
- **Status** bar (see page 17).


The framework:

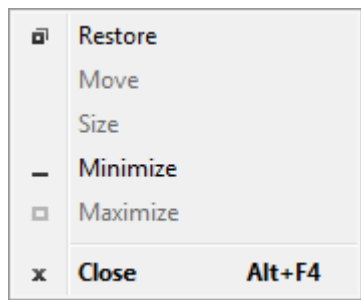
- displays information about what you are working on and where;
- controls how and where docked toolbars are positioned;
- contains a tab for each auto-hidden panel; and
- affects the size of the viewing area.





The Title bar

The **Title** bar enables you to close or resize ArtCAM Express, and displays information about what you are working on and where.

From left to right, the following is displayed along the **Title** bar:

- a control icon , which displays the control menu when you click it;



- the name of the open model;
- the product's name;
- the active view's name, when a cascaded or tiled **2D View** or **3D View** window is maximized;
- a **Minimize**  or **Maximize**  button, depending on whether full screen mode is used;
- a **Restore**  button; and
- a **Close**  button.

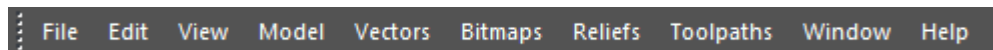
The docking areas

There are four docking areas. These are located:

- between the **Title** bar and viewing area;
- to the left of the viewing area;
- to the right of the viewing area; and
- between the **Status** bar and the viewing area.

When you start ArtCAM Express, the top docking area contains the:

- **Main Menu** bar, which is docked below the **Title** bar; and



- **File** toolbar, which is docked below the **Main Menu** bar.



When you create a model, the top docking area contains the:

- **Main Menu** bar, which is docked below the **Title** bar.
- **File, Model, Bitmap Tools, Vector Creation, Fill Tools, Relief Creation, Relief Editing** and **Vector Editing** toolbars, which are docked below the **Main Menu** bar.

File toolbar



Model toolbar



Bitmap Tools toolbar



Vector Creation toolbar



Fill Tools toolbar



Relief Creation toolbar




Relief Editing toolbar



Vector Editing toolbar





Many toolbars include toolsets, which are identified by an arrow  in a button's bottom right corner. For example, the **Model** toolbar includes the following toolset:



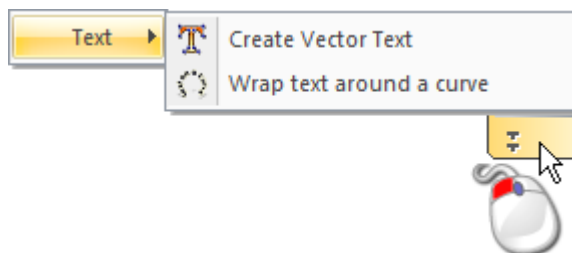
A toolset's most recently selected button is displayed in the toolbar. The other buttons are hidden.

If a complete toolbar cannot fit within a docking area:

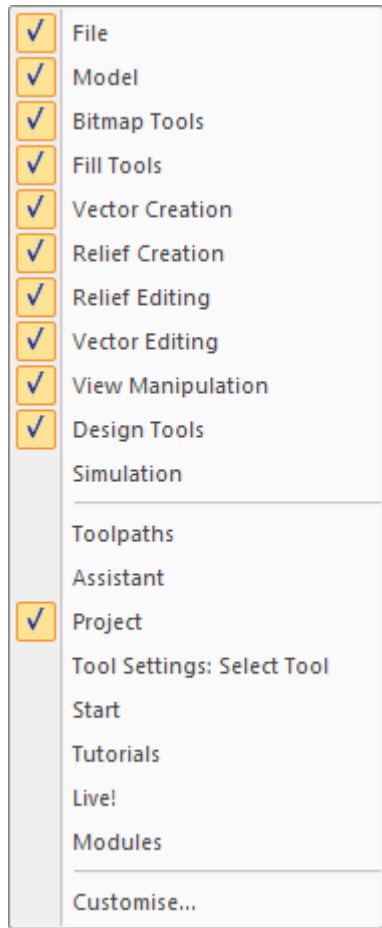
-  is displayed at the end, when the toolbar is horizontal; and
-  is displayed at the bottom, when the toolbar is vertical.


Click this to display the toolbar's other buttons as a list of options.

For example, when the **Create Vector Text** tool is not displayed in the vertical **Design Tools** toolbar, it is included in the options list:



Docking areas, toolbars and auto-hidden panels share a common context menu that you can use to control which toolbars and panels are displayed:



Pinned toolbars and panels are selected . The top half of the context menu comprises toolbar names, and the bottom half comprises panel names.

When you start ArtCAM Express, the right docking area contains the **Tutorials** and **Live!** panel tabs;



When you create or open a model, the left docking area contains the:

- **View Manipulation** toolbar:



- **Design Tools** toolbar:



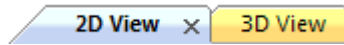
When you create or open a model, the right docking area contains the **Tutorials**, **Live!** and **Modules** panel tabs:



The viewing area

When you start ArtCAM Express, the viewing area is empty.

When you create or open a model, the viewing area contains the **2D View** and **3D View** windows, tabbed with the **2D View** window active:



The Status bar

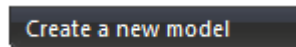
The following are displayed along the **Status** bar:

- a tool description, when the mouse cursor is over a toolbar button or menu;

For example, when the cursor is over the **File** toolbar's **New Model**



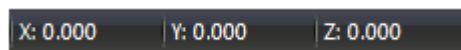
button, *Create a new model* is displayed in the bottom left:



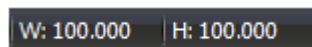
- a progress bar, when toolpaths and three-dimensional shapes are being calculated;



- the cursor's XYZ coordinates, when the mouse cursor is over the **2D View** or **3D View** window;



- the bounding box's height and width, when vector artwork or toolpath previews are selected; and



- a resizing grip.



Understanding the Project panel

The **Project** panel is the hub of ArtCAM Express, and this is why it is the only docked and pinned panel displayed when you are working with an open model.

The **Project** panel:

- is divided into two areas by a splitter bar;
- contains the Project Tree, which maps the structure of your ArtCAM model; and
- provides access to a collection of context tools.

The layout of the **Project** panel is controlled by its splitter bar, which separates the Project Tree and its context tools:

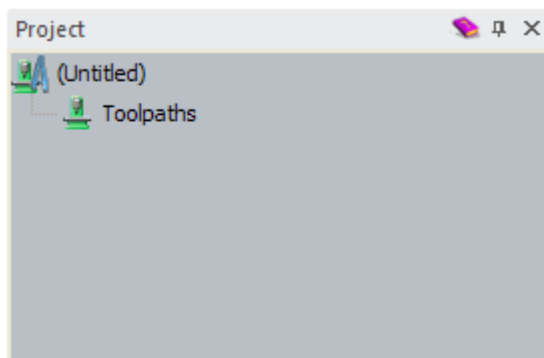


The area above the splitter bar contains the Project Tree, while the area below displays all context tools and information associated with the currently selected item in the Project Tree. The name of the currently selected item in the Project Tree is displayed on the splitter bar.


Click:

- 🏠 to display the context tools and information associated with the currently selected item in the Project Tree;
- 🔍 to maximize the area below the splitter bar, and hide the Project Tree;
- 🔍 to maximize the area above the splitter bar, and hide the context tools and information associated with the currently selected item in the Project Tree; or
- 🔍 to move the splitter bar to its central position.

When working with a new model, the Project Tree looks as follows:

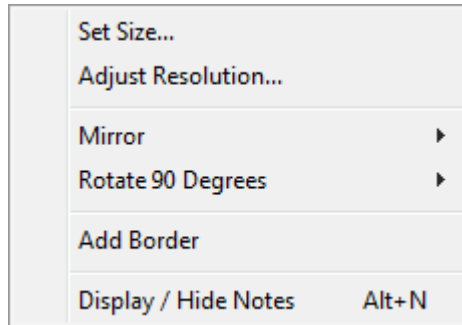


The Project Tree includes:


- , at its root. When your model is saved or imported, its name is shown here.

When selected, the model's dimensions and resolution are displayed below the splitter bar, along with the relief dimensions.

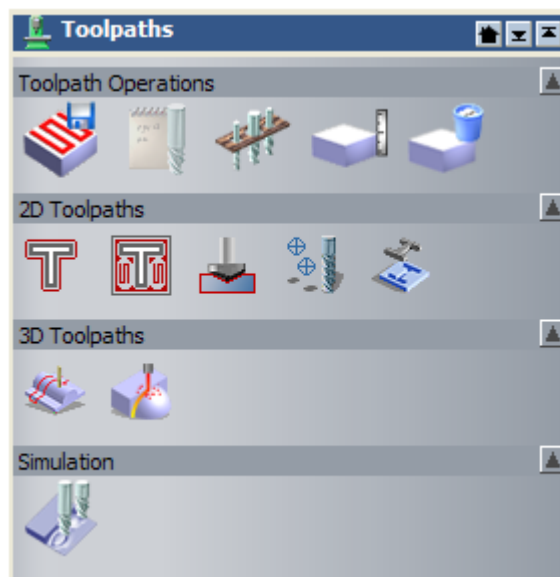
Right-click  to display its context menu:



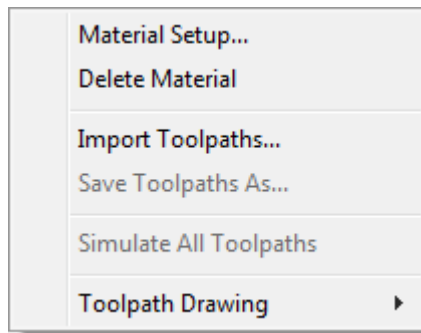
Use this to set the model's size and resolution, to mirror, rotate or add a border to the model, or to display your notes.

-  **Toolpaths**, which enables you to control your calculated and created toolpaths, and the tools they use.

When this is selected, displayed below the splitter bar are tools that enable you to create 2D and 3D toolpaths, display the **Tool Database** or a toolpath summary, specify or delete the material block, and simulate all toolpaths.




Right-click the  **Toolpaths** item to display its context menu:

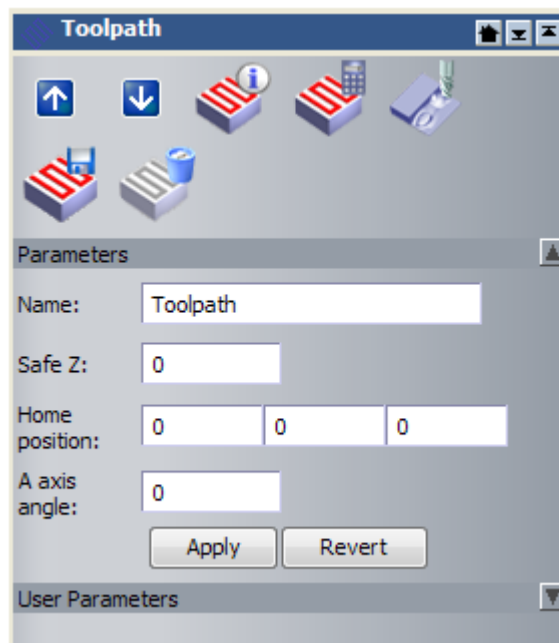


Use this to specify or delete the material block, to import toolpaths from another ArtCAM model, to save or simulate toolpaths, and to control how toolpaths are displayed.

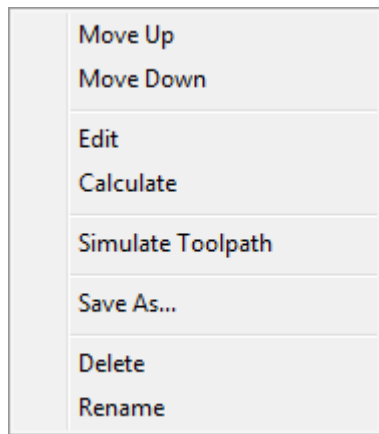
As you work in a model, other items displayed in the Project Tree include:

-  for each of the toolpath groups you calculate; beside which is shown the toolpath's name.

When this is selected, displayed below the splitter bar are tools that enable you to edit, calculate, simulate, save, delete or set the order of the toolpath. The toolpath's parameters are also shown.





Right-click  to display its context menu:



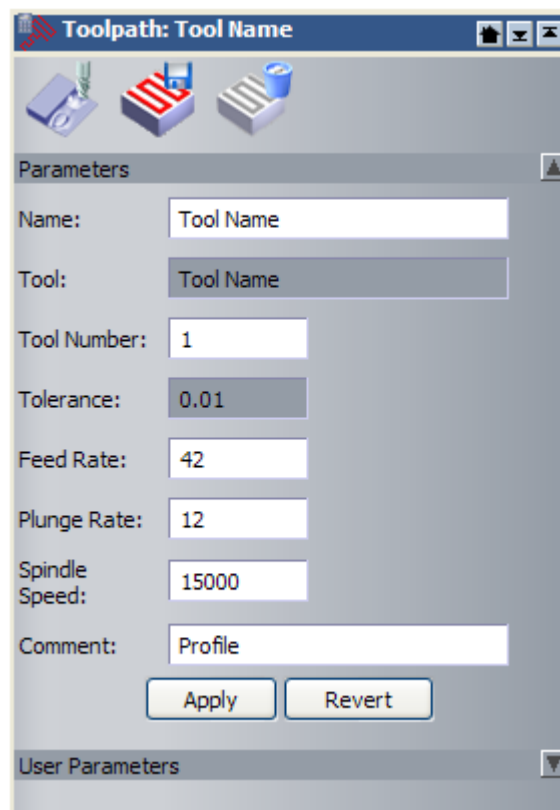
Use this to edit, to calculate, to simulate, to save, to delete, to rename, or to set the toolpath's order.



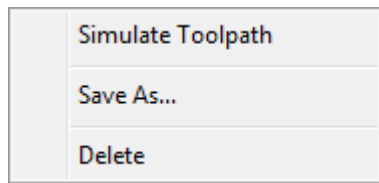
Double-click  to display the panel of settings used to create the toolpath. You can then edit or re-calculate the toolpath.

-  for each of the toolpaths used in your calculated toolpath groups; beside which is shown the tool's name.


When this is selected, the tools that enable you to edit, simulate or delete the toolpath are displayed below the splitter bar. The tool's parameters are also shown.



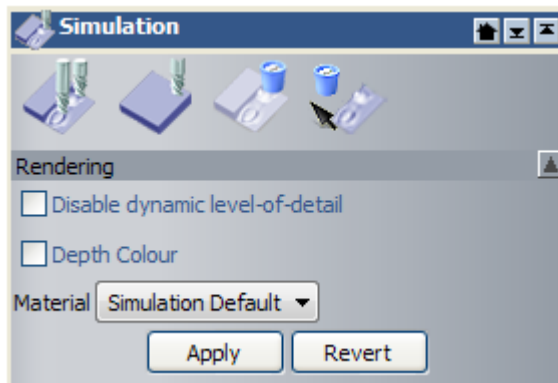
Right-click  to display its context menu:



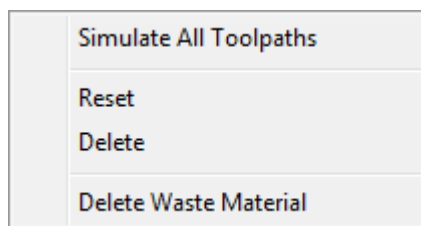
Use this to simulate, to save or to delete the tool passes.

-  **Simulation**, when you calculate one or more toolpaths.

When you select **Simulation**, the tools that enable you to simulate all calculated toolpaths, reset or delete a simulation, delete waste material from the simulation, adjust the level of detail used when zooming on a simulation, render with the primary colour all areas of a simulation below the simulation block's top surface, and choose the shading set used to render the simulation block are displayed below the splitter bar.



Right-click the  **Simulation** item to display its context menu:





















Use this to simulate all calculated toolpaths, to reset or delete a simulation, and to delete waste material from a simulation.

When working in the Project Tree, the name of:

- the currently selected item is highlighted in the Project Tree, and displayed on the splitter bar.
- each active item is displayed in bold text.
- a calculated toolpath is displayed in black text.
- an uncalculated toolpath is displayed in red text.
- an unlicensed toolpath is displayed in orange text.

Controlling the visibility of toolpaths

You can control the visibility of objects in the viewing area using the light bulbs which are displayed beside each item in the Project Tree. The light bulbs indicate the visibility of an item. Click the light bulbs to toggle the visibility.

-  beside  **Toolpaths** indicates that all wireframe toolpath previews are visible in the **2D View** window.
-  beside  **Toolpaths** indicates that all wireframe toolpath previews are visible in the **3D View** window.
-  beside each calculated toolpath group indicates that all the toolpaths in the group are visible in the **2D View** window.
-  beside each calculated toolpath group indicates that all the toolpaths in the group are visible in the **3D View** window.
-  beside  **Toolpaths** indicates that all wireframe toolpath previews are hidden in the **2D View** window.
-  beside  **Toolpaths** indicates that the **2D View** window contains both hidden and displayed toolpaths.
-  beside  **Toolpaths** indicates that all wireframe toolpath previews are hidden in the **3D View** window.
-  beside  **Toolpaths** indicates that the **3D View** window contains both hidden and displayed toolpaths.
-  beside each calculated toolpath indicates that a toolpath is visible in the **2D View** window.
-  beside each calculated toolpath indicates that a toolpath is hidden in the **2D View** window.
-  beside each calculated toolpath indicates that a toolpath is visible in the **3D View** window.
-  beside each calculated toolpath indicates that a toolpath is hidden in the **3D View** window.

Understanding the Tool Settings panel

The **Tool Settings** panel is one of the most important panels, particularly when creating bitmap and vector artwork. The panel is automatically displayed when you select a tool that includes settings accessed through it.

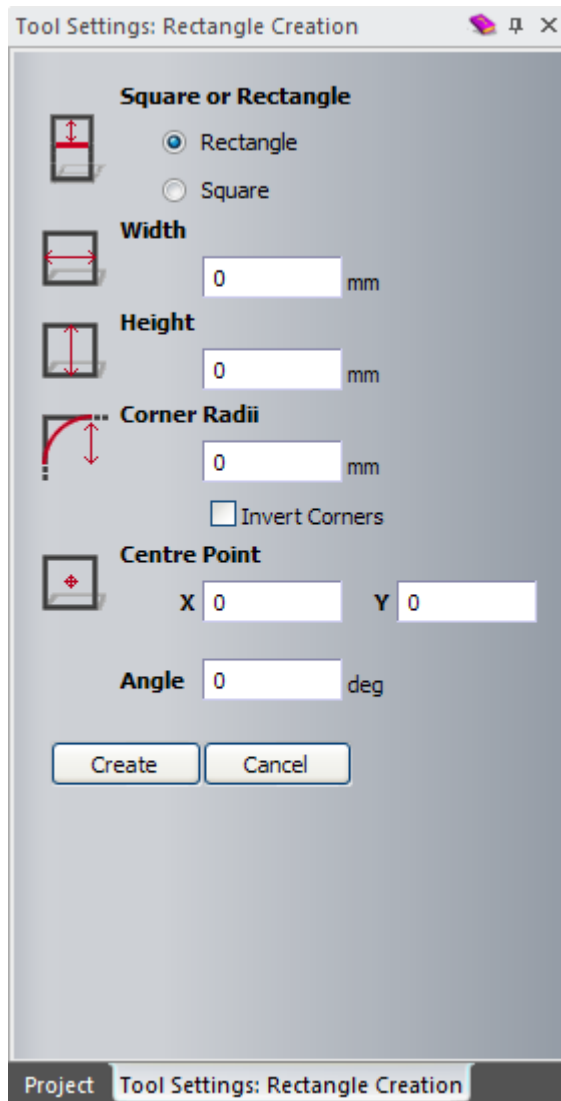
When displayed, the **Tool Settings** panel:

- is docked, pinned and embedded in the same container as the **Project** panel;
- displays the name of your selected tool on its header and tab.
- contains the settings associated with your selected tool.

Tools that require direct interaction with the **2D View** or **3D View** windows display settings on the **Tool Settings** panel. This includes the following tools:

Tool Category	Tools
Design Tools	Select, Node Editing, Transform, Draw, Paint, Paint Selective, Measure Tool, Create Polyline, Create Rectangles, Create Circles, Create Ellipse, Create Polygons, Create Stars, Create Arcs, Create Vector Text and Wrap text around a curve.
Vector Creation	Fillet Vectors and Trim Vectors.
Simulation	Delete Waste Material Tool.

For example, with the **Create Rectangle** tool selected, the **Tool Settings** panel looks as follows:



When the **Tool Settings** panel is already displayed and you select:

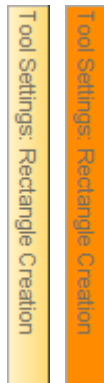
- a tool that displays a dialog or its own floating panel of settings, the panel stays displayed. The panel shows the settings associated with the last selected tool to make use of it. This enables you to work with different combinations of tools at the same time. For example, **Create Rectangle** and **Adjust Model Resolution**.
- a tool that does not have any associated settings, the panel is automatically hidden. For example, **Flood Fill**.
- the **Select** tool, the panel is automatically hidden.

To toggle the display of the **Tool Settings** panel, use one of the following methods:


- Press the **F6** key.
- In the **Main Menu** bar, select **Window > Display Tool Settings**.

- In the **Main Menu** bar, select **Window > Toolbars and Docking Windows > Tool Settings**.

If you dock and auto-hide the **Tool Settings** panel anywhere in the ArtCAM Express framework, the panel is tabbed. When you select a tool that includes settings accessed through the **Tool Settings** panel, its tab flashes dark orange three times. For example, when selecting the **Create Rectangle** tool, the **Tool Settings** panel's tab flashes between the following:



If you move the **Tool Settings** panel into a floating position and then hide it, the panel is automatically displayed in its last position when you select a tool that includes settings accessed through it. It stays displayed until you:

- click  on the panel's header;
- choose the **Select** tool after using any other tool that makes use of the panel;
- choose another tool that does not include settings accessed through the panel;
- press the **Esc** key after using any other tool that makes use of the panel;
- press the **F6** key;
- deselect **Window > Display Tool Settings** from the **Main Menu** bar; or
- deselect **Window > Toolbars and Docking Windows > Tool Settings** from the **Main Menu** bar.

Extending ArtCAM Express

The **Modules** panel provides brief information about the modules compatible with ArtCAM Express, and enables you to purchase them. Modules offer a more versatile way of working, and increase your choice of machining methods.

On starting ArtCAM Express, and when no model is open, the **Modules** panel is docked and pinned on the right.

When you create or open a model, the **Modules** panel is auto-hidden. The space previously occupied by the **Modules** panel is then used by the viewing area.

Use one of the following methods to display the **Modules** panel:

- Move the mouse cursor over the **Modules** tab in the docking area to the right of the viewing area:



- Right-click a docking area, and then click to select **Modules** in the context menu.
- In the **Main Menu** bar, select **Window > Toolbars and Docking Windows > Modules**.
- In the **Main Menu** bar, select **Help > Modules**.
- In the **Start** panel, click **Modules** in the **Upgrades** area.



*By default, the **Start** panel is displayed only when no model is open.*

The **Modules** panel includes a:

- list of modules already installed.
- list of modules available to purchase.
- shopping basket to purchase modules (see page 28).
- tools to activate purchased modules (see page 39).

The ten available modules are:

- **Advanced 2D Machining** — This enables you to apply several machining enhancements to new or previously calculated toolpaths that include one or more profile passes. These enhancements help deliver a better finish in your machined pieces, and reduce wear on your cutting tools.

- **Nesting** — This enables you to fit vector text and shapes within a defined area; helping you to make economical use of your material, and to increase the efficiency of the toolpaths used to machine your pieces.



*The **Nesting** module includes all of the functionality associated with the **Advanced 2D Machining** module. If you have the **Nesting** module installed, the **Advanced 2D Machining** module is moved from your list of available modules to your list of installed modules.*

- **Vector Tools** — This enables you to work with several different pieces of vector artwork in a single ArtCAM model. It also provides further flexibility when editing vector artwork, and in converting vector artwork to bitmap artwork.
- **Bitmap Layers** — This enables you to work with several different images in a single ArtCAM model. These can be converted into vector artwork, or used to shade all or part of the relief.
- **Smart Engraving** — This enables you to create a toolpath that engraves within or around the boundary of vector text or a selection of vectors.
- **Raised Round** — This enables you to create a toolpath that produces precise recessed letters and shapes using vector text or a selection of vectors.
- **Feature Machining** — This enables you to create a toolpath that machines raised, recessed or centreline-engraved features created from vector artwork.
- **File Import** — This enables you to import a greater variety of 3D surface model files. These can be imported into an ArtCAM model and combined with your relief.
- **Texture Toolpath** — This enables you to create a toolpath that machines a texture across the whole surface, or a specific area, of your ArtCAM model using only a tool's geometry and machining parameters.
- **Font Creator** — This enables you to create your own fonts, or modify the collection of fonts already installed on your computer.

Purchasing modules

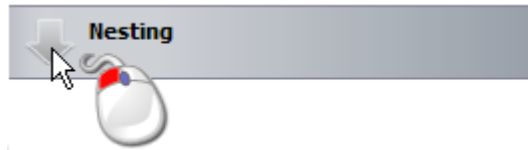
To purchase one or more modules:

- 1 Display the **Modules** panel (see page 27).

If you already have one or more modules installed, these are listed in the **Installed Modules** area. If you have no modules installed, the **Installed Modules** area is not shown.

- 2 In the **Available Modules** area, click the name of the module that you want to buy.

For example, **Nesting**:





A brief description of the module is displayed, along with:

- an **Add** button. This adds the module to your shopping basket.
 - a **Learn More** link. This opens a new browser window containing information about the module.
 - a **Documentation** link. This opens a help file containing information about the module, and how it is used.
- 3 Use one of the following methods to add a module to your shopping basket:
 - Click **Add**.
 - Double-click the grey area containing the module's name. For example, **Nesting**:



When the first module is added to your shopping basket:

- its module area is shaded green.
- the **Remove** button replaces the **Add** button.
- the shopping basket icon changes from  to .
- the shopping basket status changes from *Basket is empty* to *Selected Modules: 1*.

For each additional module that you add to the shopping basket:

- its module area is shaded green.
 - the *Selected Modules* count increases by one. For example, with the **Nesting** and **Vector Tools** modules in the shopping basket, *Selected Modules: 2* is displayed.
- 4 Use one of the following methods to remove a module from your shopping basket:
 - Click **Remove**.

- Double-click the green area containing the module's name. For example, **Nesting**:



For each module that you remove from the shopping basket:

- its module area is shaded grey.
- the *Selected Modules* count decreases by one.


When all modules have been removed from your shopping basket, *Basket is empty* is displayed.






- Ensure that only the modules that you want to purchase are included in your shopping basket, and then click **Buy Online**. The **ArtCAM Online Store** website is opened in a new browser window.

If you are not registered as a Delcam customer, the **Country Selection** page is displayed:

- Click the **Country** list, and then select the country that corresponds to your billing address. For example, **United Kingdom**. This ensures that your items are priced in the correct currency.
- Click **Next**. The **Product Selection** page is displayed.

If you are a registered Delcam customer, the **Product Selection** page is displayed:



Step 2: Product Selection

Note: As ArtCAM Insignia includes all the functionality of ArtCAM Express 2012 and its modules, it is not possible to purchase Insignia and Express at the same time. Adding Insignia to your basket will remove previously selected Express items.


Note: The ArtCAM training DVD does not include a licence for ArtCAM Express. The DVD is a training course for users new to ArtCAM Express who might not wish to pay for training from a Delcam Sales Partner

Dongle Options

Option

Use Existing Dongle (Upgrade Existing Seats)


Use New Dongle (Purchase Additional Seats) [Select](#)

Item	Cost	
ArtCAM Express 2012	£1,200.00	Remove
Bitmap Layers	£1,200.00	Add
Vector Tools	£1,200.00	Add
Font Creator	£1,200.00	Add
Advanced 2D Machining	£1,200.00	
 Nesting	£1,200.00	Remove
Texture Toolpath	£1,200.00	Add
Smart Engraving	£1,200.00	Add
Raised Round	£1,200.00	Add
Feature Machining	£1,200.00	Add
File Import	£1,200.00	Add
Training DVD Only - for ArtCAM Express	£1,200.00	Add
ArtCAM Insignia 2012	£1,200.00	Add

Sub Total: £12,000.00

[Empty Basket](#)
[Next >>](#)

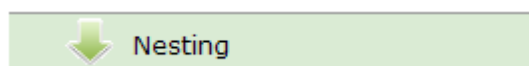
- Country Selection
- Product Selection**
- Personal Information
- Order Confirmation
- Payment
- Transaction Status



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The **Use Existing Dongle (Upgrade Existing Seats)** option is selected. For each of the modules already included in your shopping basket:

- its name is shaded in green. For example, **Nesting**.





- its price is displayed.

- the **Remove** option is displayed.

The cost of your selected modules, before any applicable taxes, is also shown.

6 Click:


-  to open a new window displaying information about the module. Click  to close the window.
- **Add** to add a module to your shopping basket. The **Sub Total** is updated, the module's name is shaded green, and **Remove** replaces **Add**.








*If you have selected the **Nesting** module, the **Advanced 2D Machining** module cannot be selected. The **Nesting** module includes all of the features in the **Advanced 2D Machining** module, and more.*

- **Remove** to remove a module from your shopping basket. The **Sub Total** is updated, the module's name is no longer shaded, and **Add** replaces **Remove**.
- **Empty Basket** to empty your shopping basket. The **Sub Total** is reset. The **Next** button is greyed-out, and stays that way until at least one module is in your shopping basket.

7 Click **Next**. The **Personal Information** page is displayed:



The ArtCAM Online Store



Step 3: Personal Information

Order Contacts

Please select a contact or select create a new contact if your contact details are not correct. The details selected here will be used for correspondence about your order and ArtCAM software.

Contact	Email	
Company / Individual	XXXXXXXXXXXX@XXXX	<input type="radio"/>
Create a new contact		<input type="radio"/>

1) Country Selection

2) Product Selection

3) Personal Information

4) Order Confirmation

5) Payment

6) Transaction Status

Billing Address

Company

Address Line 1*

City*

County / Province*

Postcode / Zipcode*

Country

Telephone Number*

Vat Reg Number (EU Only)

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8 To change the contents of your shopping basket, click **Back** and then repeat the last two steps.

9 In the **Order Contacts** area, select:

- the contact entry including your correct name and email address. Your purchase invoice and updated PAF licence file are sent separately to this email address.
- Create a new contact** if your name and email address are incorrect.

- 10** If you have selected **Create a new contact**, enter and review your contact information:
- a** In the **Full Name** field, type your first name (given name) and second name (surname).
 - b** In the **Email** field, type your email address. Your purchase invoice and updated PAF licence file are sent separately to this email address.
 - c** In the **Confirm Email Address** field, type the same email address displayed in the **Email** field.
- 11** Enter and review your billing information, including your EU VAT registration number (if applicable):
- a** In the **Company** field, type your company name (if applicable).
 - b** In the **Address Line 1** field, type your house number and street name, or your post office (P.O.) box number.
 - c** In the **City** field, type the name of the city that corresponds with your billing address.
 - d** Click the **County / Province** list, followed by your county, state or province.
 - e** In the **Postcode / Zipcode** field, type your postal or zip code.
 - f** In the **Telephone Number** field, type your preferred contact number.
 - g** If you are an EU VAT registered customer, type your ISO Country Code followed by your VAT number in the **VAT Reg Number** box. For example, GB 123456789.

12 Click **Next**. The **Order Confirmation** page is displayed:

Step 4: Order Confirmation

Billing Address

Mr. John Smith
123 Main Street
London, UK
EC1A 1AA
Tel: 020 1234 5678
Email: john.smith@example.com

Order Contents

Item	Cost
Nesting	£120.00
Sub Total:	£120.00
VAT:	£24.00
Total:	£144.00

Click 'Confirm Order' to finish your order and proceed to the payment stage.

[<< Back](#) [Confirm Order](#)


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This shows:







- your billing information.
- the modules included in your shopping basket.
- the price of each module in your shopping basket.
- the combined cost of your chosen modules, before any applicable taxes.
- the cost of all applicable taxes (for example, VAT if you are an EU customer).
- the total cost.

13 If there are any mistakes in your billing information, click **Back** and then repeat the last two steps.

14 Click **Confirm Order**. The **Payment** page is displayed:



The ArtCAM Online Store



Step 5: Payment

Your order is ready for processing. Click 'Make Payment' to be transferred to our payment provider and complete your transaction.

Order ID =

By clicking "Make Payment" you are agreeing to the Terms and Conditions of sale. A copy of the current Terms and Conditions can be found [here](#).

Make Payment

1) Country Selection

2) Product Selection

3) Personal Information

4) Order Confirmation



5) Payment

6) Transaction Status



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15 Click **Make Payment**. The payment provider page is displayed:



Secure, reliable internet payments from



NB: Switch and Solo cards can only be used for sterling transactions



Verified by
VISA

MasterCard.
SecureCode.

Payment Information - Total Payment Value: £ 1000.00

1 – Card Details

Card Type *
Select...
Card Number *
Expiry Date *
mm yy
Valid From
mm yy † UK Maestro / Solo only
Issue Number † UK Maestro / Solo only
Card Security Code
[What is this?](#)

2 – Cardholder Information

Full Name *
Address Line 1 *
Address Line 2
Address Line 3
Town / City *
County
Post / Zip Code *
State (* if US) --
Country *
Telephone Number
Email Address *

* Indicates a mandatory field
† Mandatory field for Maestro cards issued in the UK and Solo cards

Clear Form

Submit Payment



16 In the **Card Details** area, enter and review your payment card details.

17 In the **Cardholder Information** area's **Full Name** field, type your name as it is displayed on your payment card.



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- 18 Review your cardholder information, and then click **Submit Payment**. The **Payment Status** page is displayed:





Secure, reliable internet payments from



NB: Switch and Solo cards can only be used for sterling transactions





Payment Status - Success Please click 'Complete Payment' to complete your payment and process your order

Transaction Details

Payment Status: Success

Date / Time: 14/05/2013 15:00:00

Merchant: Delcam Ltd

Approval Code: 123456

Payment ID: 123

Amount: £10.00

Card Number: **** * 1234 5678 9010 1111

Expiry Date: 12/2013

Cardholder Details

Cardholder Details: Mr John Doe

Address Line 1: 123 Main St

Address Line 2: PO Box 1234

Postcode: M1 2AB

Country: United Kingdom

Phone Number: 01234 567890

Mobile Number: 07123 456789

Card Type: VISA

Card Number: **** * 1234 5678 9010 1111

Expiry Date: 12/2013

Email: john.doe@example.com

* Please print for your records (landscape format)

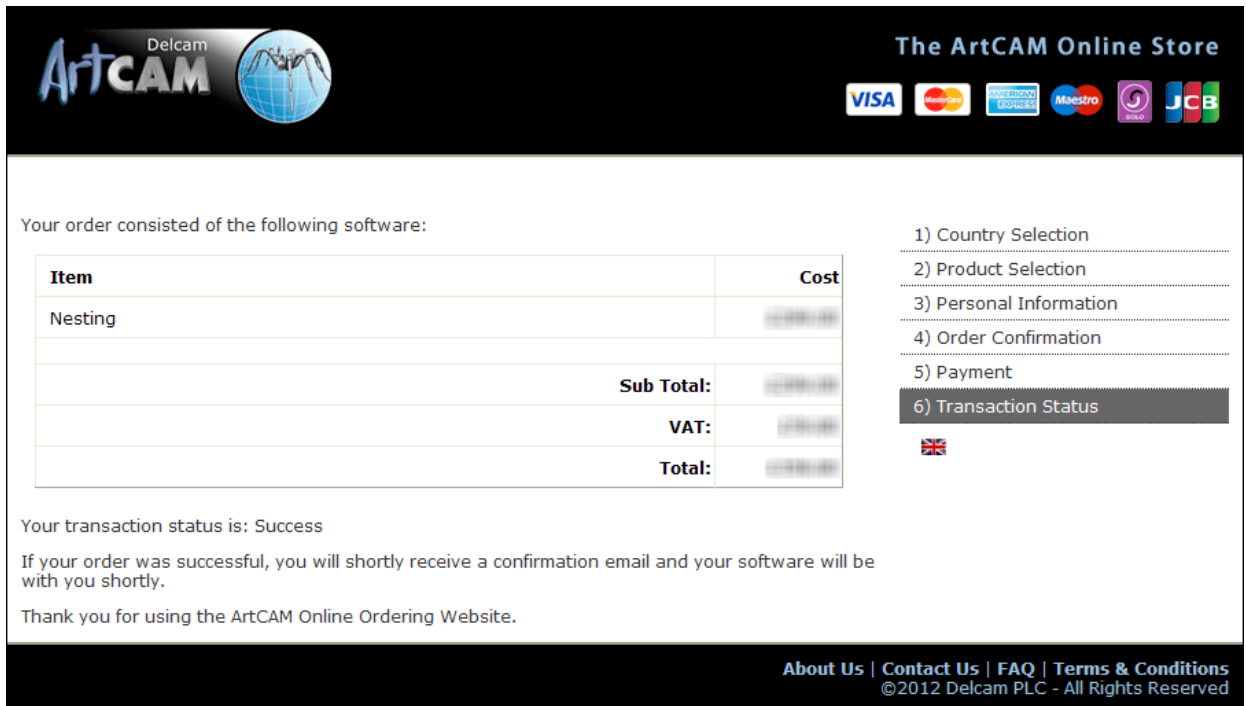
[Print](#)


Please click 'Complete Payment' to complete your payment and process your order

[Complete Payment](#)

- 19 Click:
- **Print** to print a copy of your payment information.

- **Complete Payment** to complete payment and process your order. The **Transaction Status** page is displayed:



Delcam ArtCAM  **The ArtCAM Online Store**

VISA MasterCard AMERICAN EXPRESS Maestro JCB

Your order consisted of the following software:

Item	Cost
Nesting	£1,200.00
Sub Total:	£1,200.00
VAT:	£240.00
Total:	£1,440.00

1) Country Selection
2) Product Selection
3) Personal Information
4) Order Confirmation
5) Payment
6) Transaction Status

UK

Your transaction status is: Success

If your order was successful, you will shortly receive a confirmation email and your software will be with you shortly.

Thank you for using the ArtCAM Online Ordering Website.

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Activating a module

When you have purchased a new ArtCAM Express module from the online store, you are:

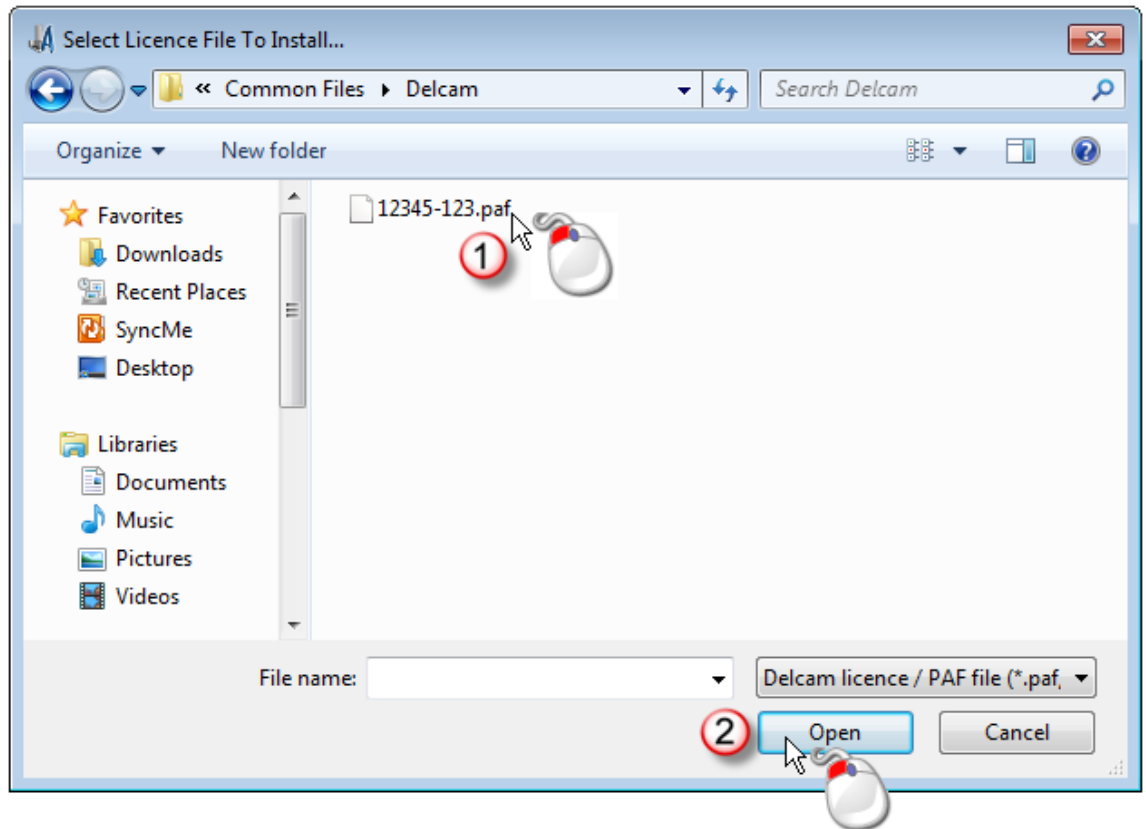
- sent an email confirming your purchase.
- issued a new PAF licence file (*.paf) by email.

Before you can use the module, you must activate it using your new PAF licence file.

To activate a new module:

- 1 Display the **Modules** panel (see page 27).
- 2 In the **Install licence from** area, click:
 - **Internet** if you have an internet connection. A message dialog is displayed confirming that your licence file has been installed. Click **OK** to close the message dialog.
 - **PAF File** if you cannot connect to the Internet, but have the PAF file that was sent to the email address specified during your module purchase. The **Select Licence File To Install** dialog is displayed.

Select the PAF file (*.paf), and then click **Open**:

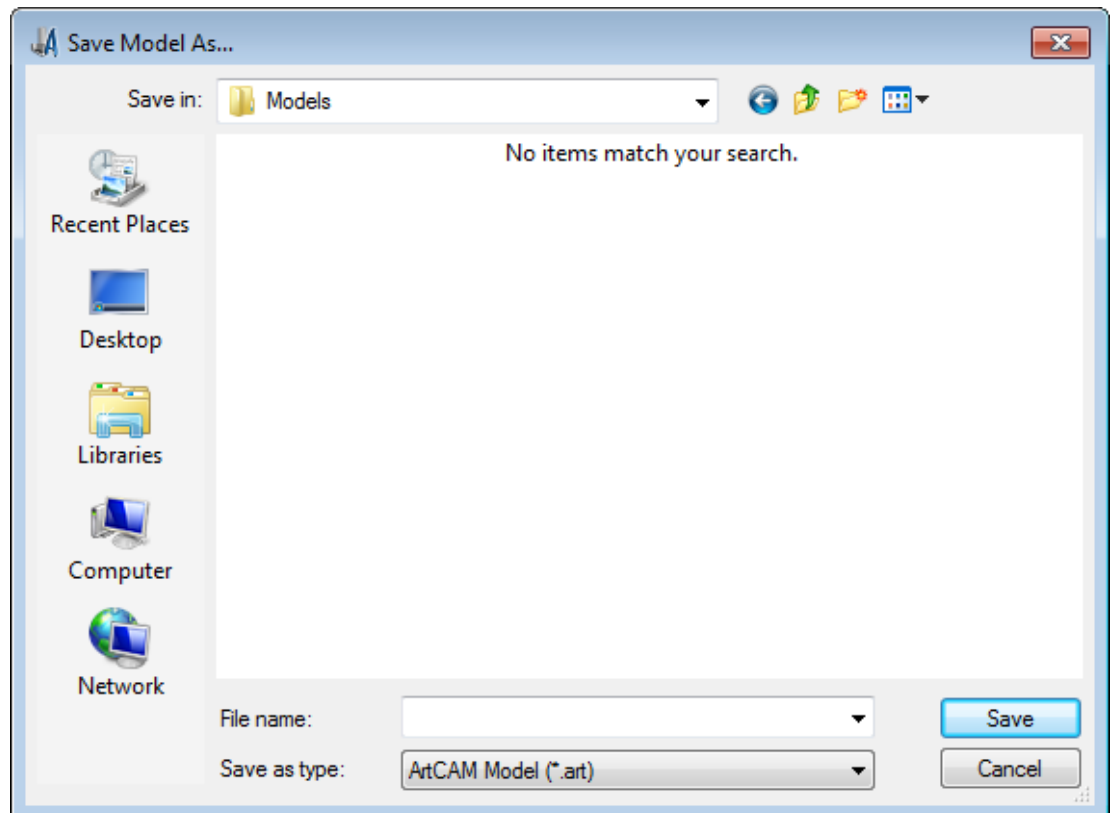


A message dialog is displayed confirming that your licence file has been installed. Click **OK** to close the message dialog.

3 Restart ArtCAM Express:

- a** In the **Main Menu** bar, select **File > Exit**. If a model is open, a message dialog is displayed asking if you would like to save it. If you click **Yes** and you:
 - have previously saved the model, your changes are saved; overwriting the previous model file (*.art).

- are saving the model for the first time, the **Save Model As** dialog is displayed:



In the **File name** field, enter the name that you want to give to the model.

Click **Save** to save the model, close the dialog and shut down ArtCAM Express.

- a Click **Start > All Programs > ArtCAM 2013 > ArtCAM 2013**.

Tutorial - Saw Mill sign

This tutorial demonstrates how to create a *Saw Mill* sign from vector artwork. You will use ArtCAM Express's **Vector Creation** and **Vector Editing** tools to adapt the imported vector artwork, and then its **Toolpath Operation** tools to calculate the toolpaths needed to machine the sign.

The stages covered by this tutorial are:

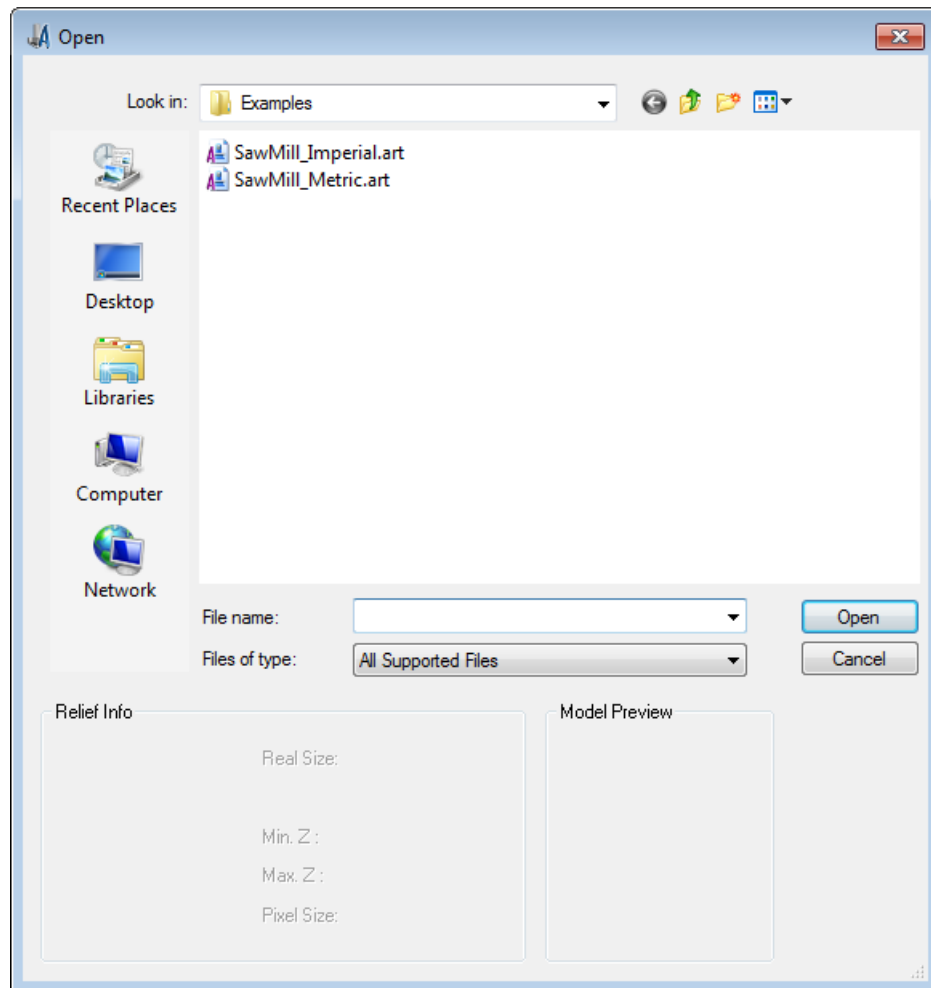
- Preparing the model (see page 43).
- Creating the offset vectors (see page 45).
- Grouping the offset vectors (see page 47).
- Creating additional vector text (see page 50).
- Repositioning the vector text (see page 51).
- Clearing the area around the text (see page 53).
- Carving the text (see page 56).
- Cutting out the sign (see page 58).
- Saving the toolpaths (see page 63).

At the end of this tutorial, you will have created all of the toolpath files needed to machine the *Saw Mill* sign using ArtCAM Express.

Preparing the model

This section describes how to open the ArtCAM model containing the vector artwork needed to produce the *Saw Mill* sign.

- 1 In the **Start** panel, click **Open Model** . This displays the **Open** dialog.



- 2 Navigate to the *Examples* folder on your computer.



If you did not install the Examples folder along with ArtCAM Express, you can find the folder on the ArtCAM Express installation DVD.

- 3 To complete this tutorial using:
 - metric measurements, select the [SawMill_Metric.art](#) file.
 - imperial measurements, select the [SawMill_Imperial.art](#) file.



The [.art](#) suffix indicates that the selected file is an ArtCAM model.

In the **File name** field, the name of the selected file is displayed.

- 4 Click **Open** to close the dialog and open the selected ArtCAM model file.


ArtCAM Express displays the **2D View** window by default. The white rectangle shown in the window is the model area. In this area you can see the vector artwork you will use as the foundation in the process of creating the *Saw Mill* sign.

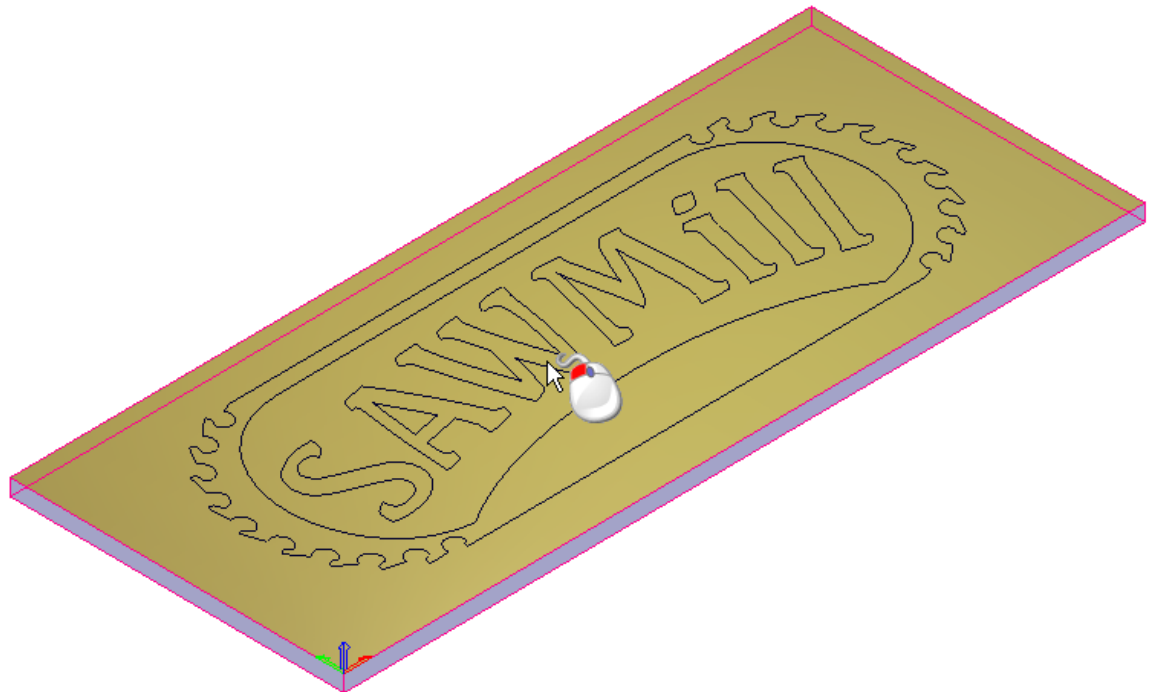
Preparing the vector artwork

This section describes how to add to the vector artwork already included in the model so that you are ready to create the toolpaths needed to machine the *Saw Mill* sign. These vectors comprise offsets and text.

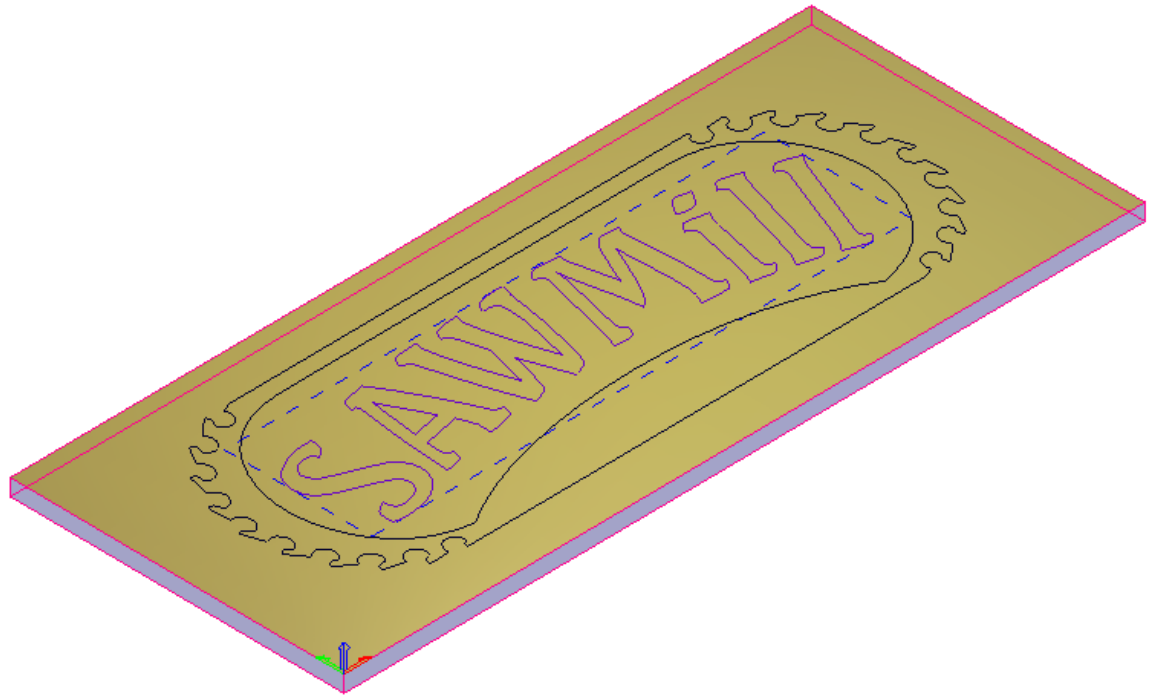
Creating the offset vectors

You are now ready to create some additional vectors using the artwork already in the model. This is needed when creating the toolpaths used to machine the *Saw Mill* sign.


- 1 Press the **F3** key to display the **3D View** window.
- 2 In the **3D View** toolbar, click **Toggle Vector Visibility** . The vector artwork is displayed in the **3D View** window.
- 3 Select the grouped vectors that make up the *Saw Mill* vector text:



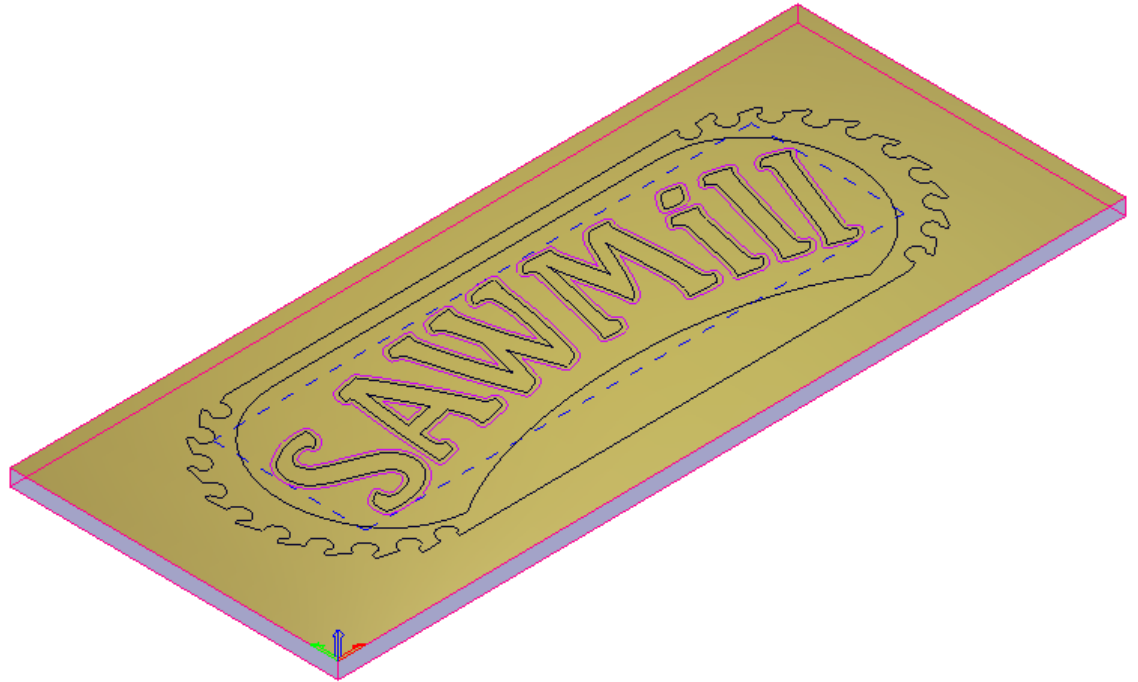
The characters that make up the *Saw Mill* vector text are shown in purple and surrounded by a bounding box, indicating that they are both grouped and selected:



As the characters that make up the *Saw Mill* vector text are already grouped, you can create an offset vector around them all at once.

- 4 In the **Vector Creation** toolbar, click **Offset Vectors** . This displays the **Tool Settings: Offset Vectors**.
- 5 In the **Offset Distance** field, enter **6 mm (0.2 inches)**.
- 6 In the **Offset Direction** area, select **Outwards/right**. This instructs ArtCAM Express to draw the offset vectors around the outside of the selected vector text.
- 7 In the **Offset Corners** area, select **Radiused**.
- 8 Deselect **Delete original vectors**.
- 9 Select **Select resulting offset**.
- 10 Click **Offset** to create the offset vectors.

The offset vectors are shown in magenta and surrounded by a bounding box; indicating they are ungrouped and selected:



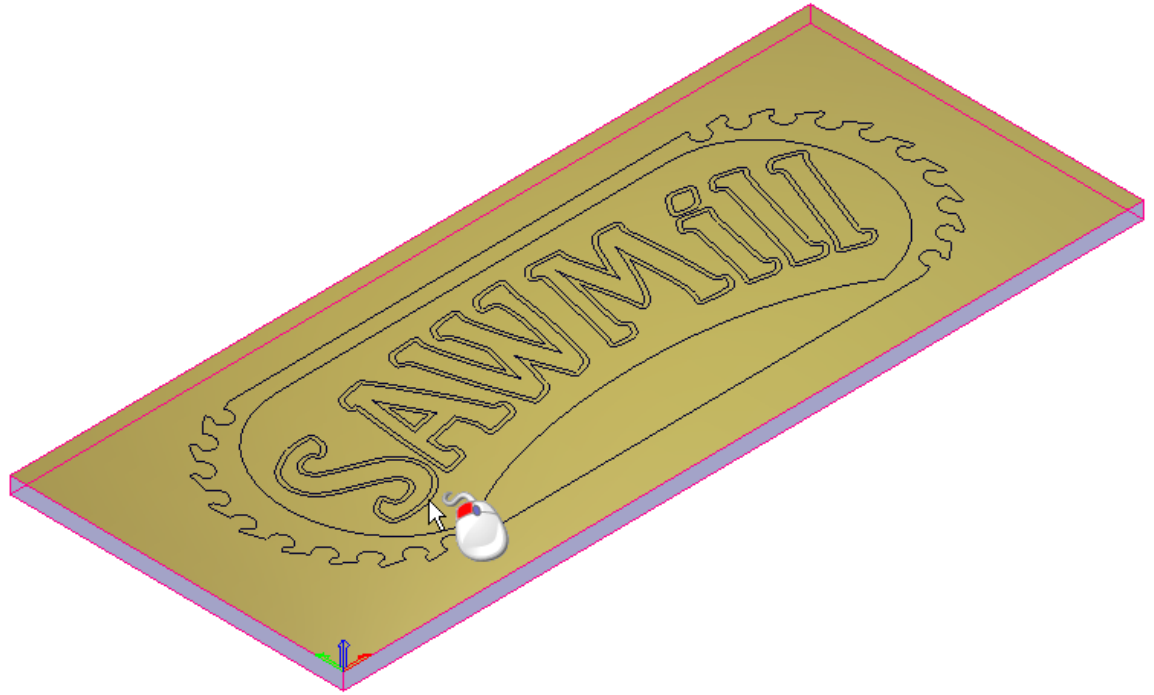
- 11 On the **Tool Settings: Offset Vectors** panel's header, click  to close the panel.

Grouping the offset vectors

As the same toolpath settings will be applied to the offset vectors, it is easier to group them together now and select them simultaneously, rather than selecting each of the offset vectors in turn when creating your toolpaths.

- 1 In the **3D View** window, click an empty area to deselect the offset vectors. The offset vectors are shown in black, indicating they are no longer selected.

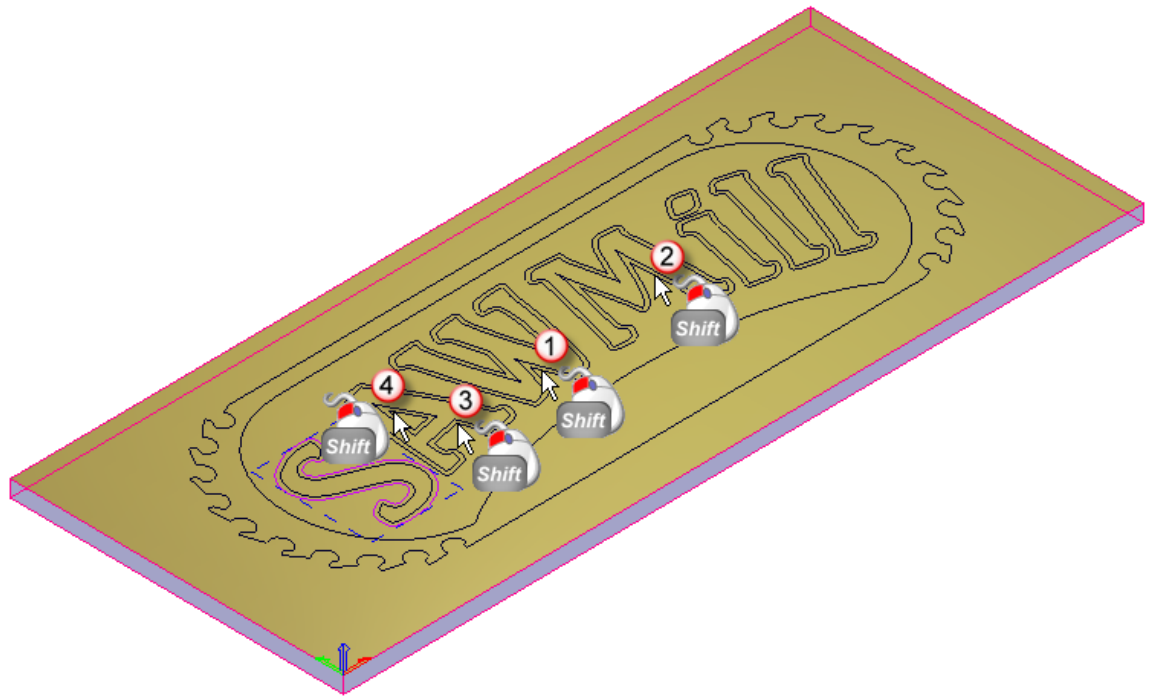
- 2 Select the offset vector that surrounds the *S* character in the *Saw Mill* vector text.



The offset vector is shown in magenta and surrounded by a bounding box, indicating it is ungrouped and selected.

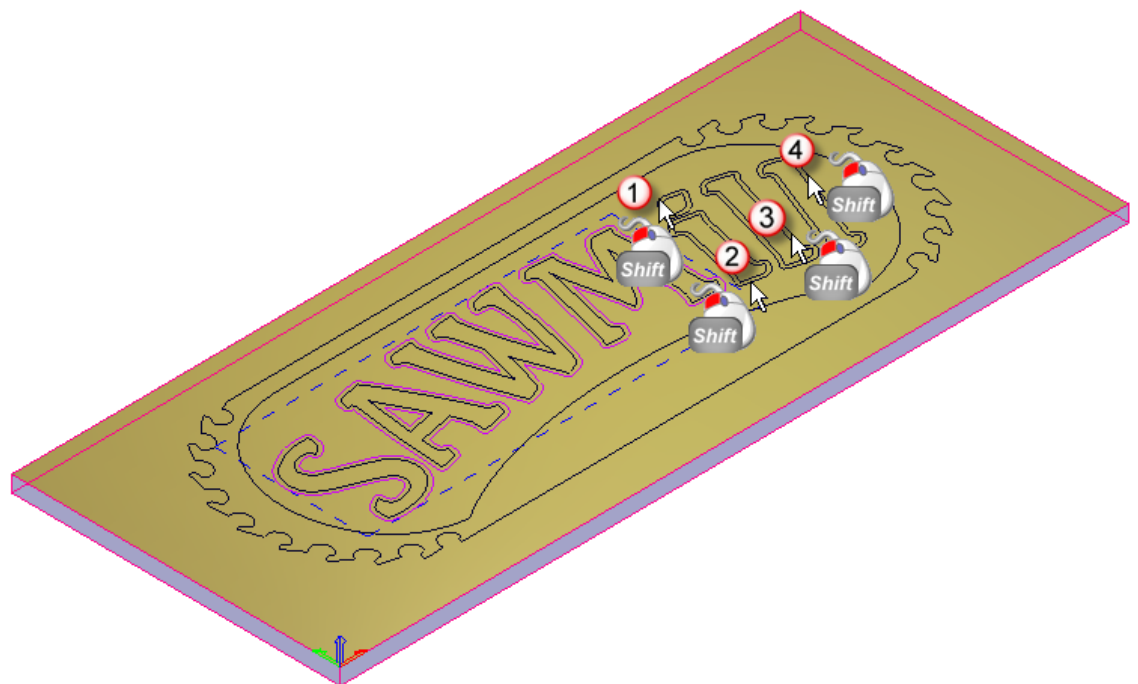
- 3 Using the **Shift** key enables you to select multiple vectors. Hold down the **Shift** key, and then select the offset vector:
 - that surrounds the *W* character.
 - that surrounds the *M* character.
 - that surrounds the *A* character.

- within the *A* character's internal cavity.



The offset vectors are shown in magenta and surrounded by a bounding box, indicating that they are ungrouped and selected.

- 4 Hold down the **Shift** key, and then, in the *Saw Mill* vector text, select the offset vector that surrounds the:
 - dot in the *i* character.
 - lower part of the *i* character.
 - two */* characters.






The offset vectors are shown in magenta and surrounded by a bounding box, indicating that they are ungrouped and selected.


- 5 Press the **Ctrl+G** keys to group the selected offset vectors. All of the offset vectors are shown in purple and surrounded by a bounding box, indicating that they are grouped and selected:



Creating additional vector text

You are now ready to create the vector text required to produce some additional text in the finished *Saw Mill* sign.

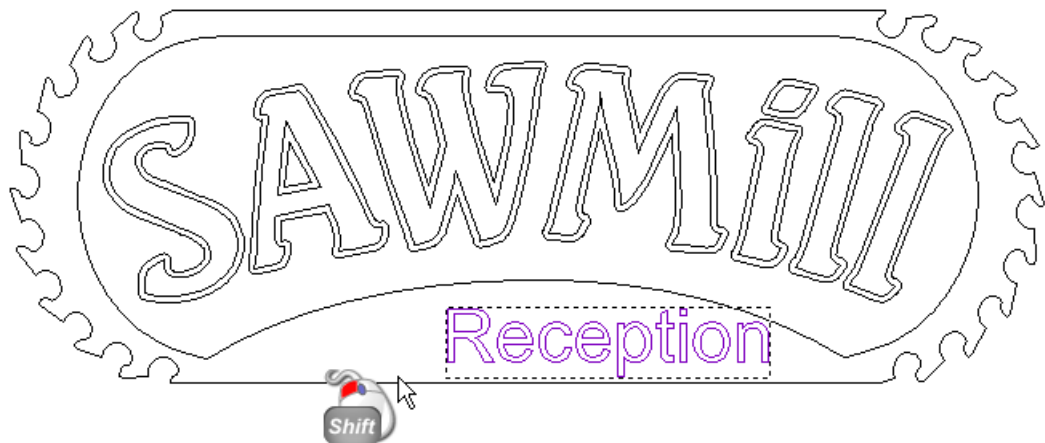
- 1 Press the **F2** key to display the **2D View** window.
- 2 Click anywhere in the model area to deselect the grouped offset vectors.
- 3 In the **Design Tools** toolbar, click **Create Vector Text** . This displays the **Tool Settings: Text Tool** panel.
- 4 In the **Tool Settings: Text Tool** panel, click **Align Left** . This instructs ArtCAM Express to align the vector text to the left with a ragged right edge.
- 5 Click the **Font** list, then select **Arial**.
- 6 If you are using metric measurements:
 - a Click  in the **Size** area, and then select **mm** from the list.
 - b In the **Size** field, enter **51** to set the size of the vector text.

- 7 If you are using imperial measurements:
 - a Click  in the **Size** area, and then select **inches** from the list.
 - b In the **Size** field, enter **2** to set the size of the vector text.Use the default settings for the remaining options displayed on the **Tool Settings** panel.
- 8 Click anywhere in the empty model area between the outermost vector and the vector that surrounds the offset vectors.
- 9 Type **Reception**.
- 10 In the **Tool Settings: Text Tool** panel, click **Done**. The vector text is created, the panel is hidden, and the **Select** tool is re-selected.

Repositioning the vector text





You are now ready to reposition the *Reception* vector text so that it sits between the outermost vector and the vector that surrounds the grouped offset vectors.

- 1 In the **2D View** window, select the *Reception* vector text, hold down the **Shift** key, and then select the outermost vector:



The outermost vector is shown in magenta; indicating that it is ungrouped. A bounding box surrounds this and the *Reception* vector text; indicating that they are both selected:



- 2 In the **Vector Editing** toolbar, click and hold down the left mouse button when the cursor is on the **Centre In Model**  button. Its flyout toolset is displayed.
- 3 Keep the mouse button held down and, move the cursor over the **Centre Horizontally**  button in the flyout toolset.
- 4 Release the mouse button to align the centre of the outermost vector with the centre of the *Reception* vector text.
- 5 In the **2D View** window, click anywhere in the model area to deselect all vector artwork.
- 6 Select the *Reception* vector text.
- 7 Use the  and  keys to adjust the vector text until it is positioned between the grouped offset vectors and the outermost vector:



- 8 In the **2D View** window, click anywhere in the empty model area to deselect the vector text.

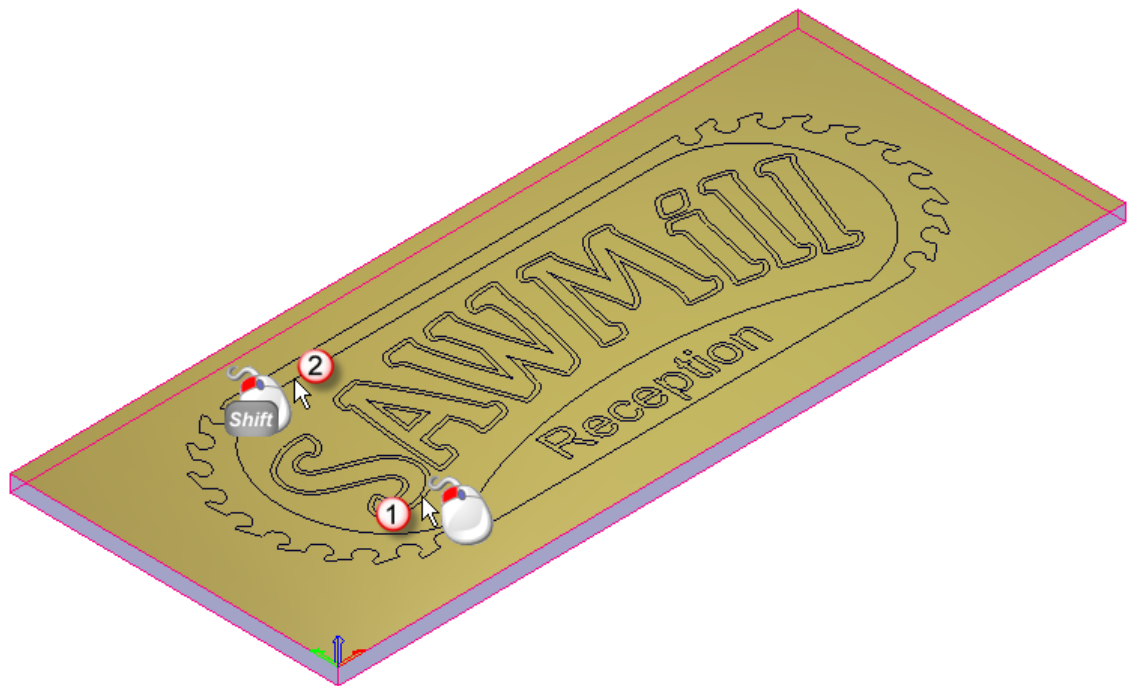
Machining the Saw Mill sign

This section describes how to create the toolpaths needed to machine the *Saw Mill* sign. The settings within each toolpath are applied to different areas of the vector artwork.


Clearing the area around the text

You can now calculate the toolpath needed to clear the area around the *Saw Mill* vector text during the machining process. The toolpath settings are applied to the area between the grouped offset vectors surrounding the *Saw Mill* vector text and the vector surrounding the grouped offset vectors. You are machining the *Saw Mill* sign out of a sheet of material that is 25 mm (1 inch) thick.

- 1 Press the **F3** key to display the **3D View** window.
- 2 In the **3D View** window, select the grouped offset vectors surrounding the *Saw Mill* vector text ①.
- 3 Hold down the **Shift** key, and then select the vector that surrounds the grouped offset vectors ②.



A bounding box surrounds the selected vectors. The offset vectors are shown in purple; indicating they are grouped. The vector that surrounds them is shown in magenta; indicating that it is ungrouped.

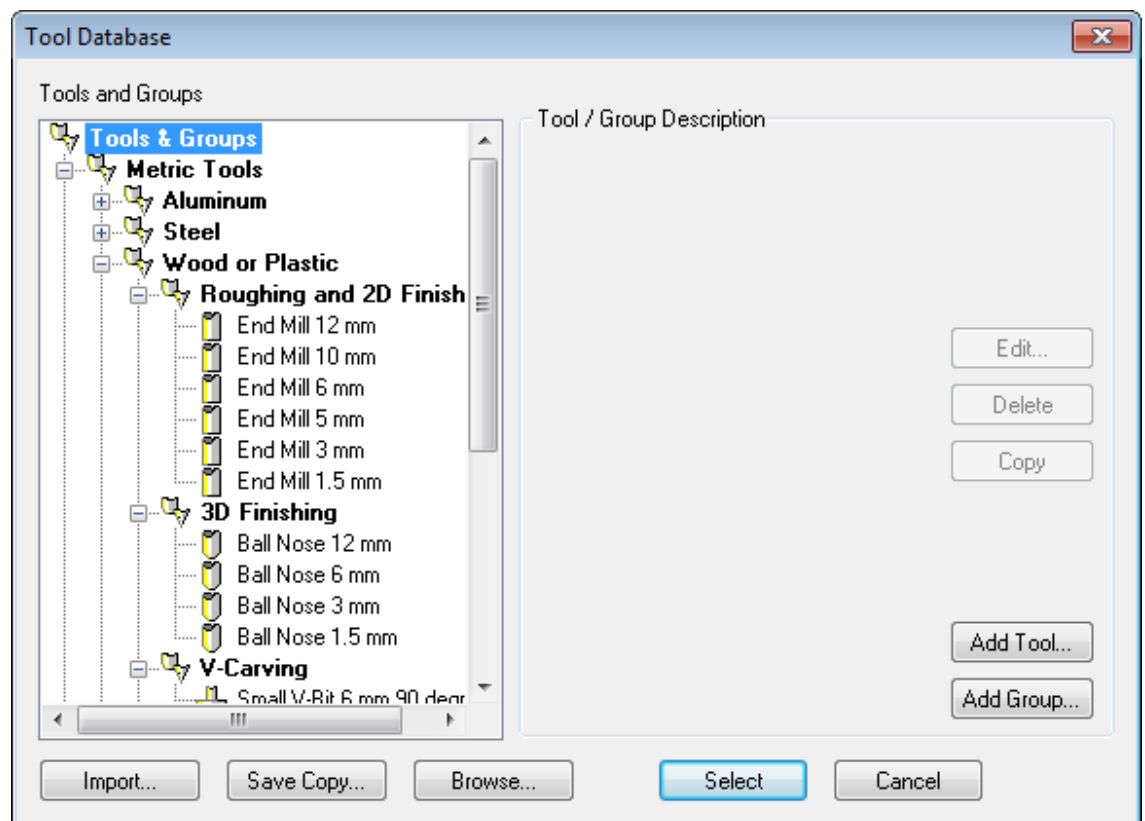
- 4 In the **Project** panel, click the  **Toolpaths** item in the Project Tree to display the **Toolpaths** panel below the splitter bar.

- 5 In the **2D Toolpaths** area of the **Toolpaths** panel, click **Create Area**



Clearance Toolpath. The **2D Area Clearance** panel is displayed.

- 6 In the **Finish Depth** field, enter **8 mm (0.25 inches)**.
- 7 Enter a **Start Depth** and **Allowance** of **0**.
- 8 Enter a **Tolerance** of **0.025 mm (0.001 inches)**.
- 9 Click the **Machine Safe Z** control bar to display its settings, and then enter **25 mm (1 inch)** in the **Safe Z** field and the **Home Position's Z** field. This controls the height at which the roughing tool makes rapid moves between toolpath segments.
- 10 In the **Tools List** area, click **Add**. This displays the **Tool Database**.



- 11 In the **Wood or Plastic > Roughing and 2D Finishing** tool group, double-click the *End Mill 10 mm (End Mill 3/8 Inch)* tool. This closes the **Tool Database** and displays the tool's description below the **Tools List** area.



*If you are using ArtCAM Express, the **Add** button is unavailable after selecting the End Mill 10 mm (End Mill 3/8 Inch) tool. This is because the Area Clearance toolpath is restricted to the use of one tool only in Express.*

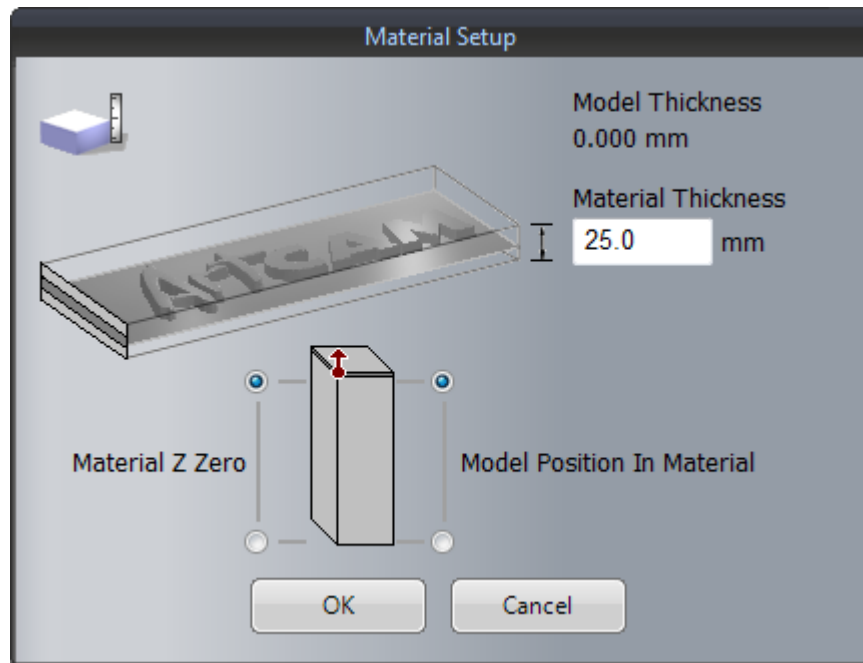


For illustration, the tool's **Stepover** has been increased to 8 mm (0.25 inches).

In the **Tool Clearance Strategy** area, ensure the **Raster** option is selected. This strategy will be used along with a **Raster Angle** of **0** in the toolpath.

12 Deselect **Add Ramping Moves**.

13 In the **Material** area, click **Setup**. This displays the **Material Setup** dialog.



- a** Enter a **Material Thickness** of **25** mm (**1** inch).
- b** Set the **Material Z Zero** position to the top of the block.
- c** Set the **Model Position In Material** relative to the top of the block.
- d** Click **OK** to close the **Material Setup** dialog.

- 14 In the **2D Area Clearance** panel, click **Calculate Now**. The toolpath is named *Area Clear* by default and is displayed in the **3D View** window:








- 15 On the **2D Area Clearance** panel's header, click  to close the panel.

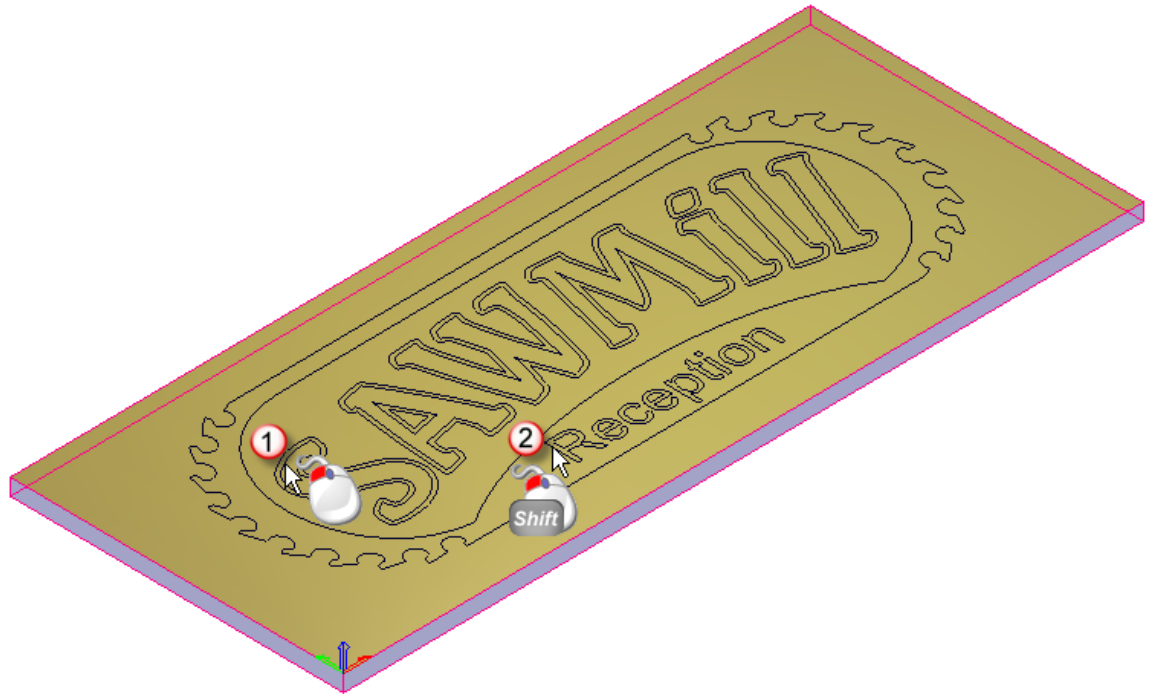
Carving the text

You are now ready to calculate the toolpath needed to carve the *Saw Mill* and *Reception* text during the machining process. The toolpath's settings are applied to the *Saw Mill* and *Reception* vector text.

You can carve the *Saw Mill* and *Reception* vector text because it has been created using fonts compatible with V-bit carving.

- 1 In the **Project** panel, click  beside the  **Toolpaths** item in the Project Tree to display the created toolpaths.
- 2 Click  and  to the right of the  *Area Clear* toolpath group. In the **3D View** window, the toolpath is hidden; making it easier to select the vector text you want to carve.
- 3 In the **3D View** window, click an empty area to deselect all vector artwork.

- 4 Select the *Saw Mill* vector text, hold down the **Shift** key, and then select the *Reception* vector text:



- 5 In the **2D Toolpaths** area of the **Toolpaths** panel, click **Create V-Bit**



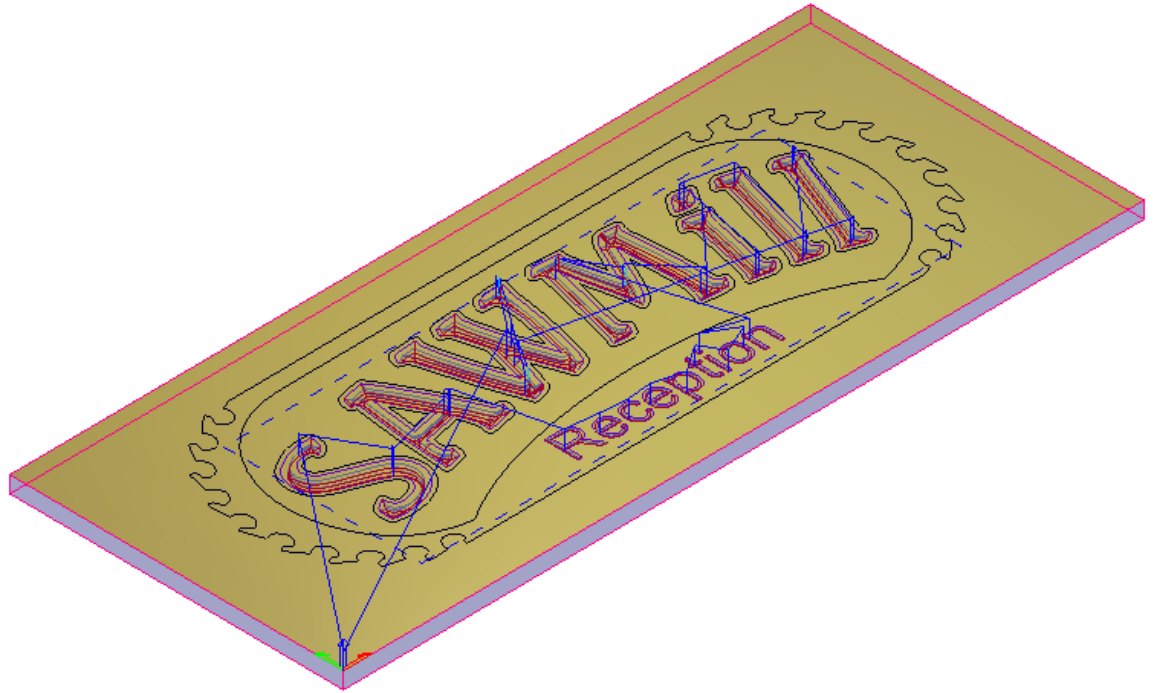
Carving Toolpath. This displays the **V-Bit Carving** panel.

- 6 In the **V-Bit Carving** panel:
 - a Enter a **Start Depth** of **0**.
 - b Deselect **Limit tool maximum depth**.
 - c Enter a **Tolerance** of **0.025** mm (**0.001** inches).
 - d In the **Carving Tool** area, click the control bar to display the **Tool Database**.
 - e In the **Wood or Plastic > V-Carving** tool group, double-click the *V-Bit 32 mm 110 degree (V-Bit 1.25 Inch 110 degree)* tool. This closes the **Tool Database** and displays the tool's description in the **Carving Tool** area.
 - f Click **Refresh**. The **Maximum Width** and **Maximum Depth** values are displayed.
 - g In the **Carving Tool** area, click the tool's description to display its machining parameters, and then enter **2** in the **Tool Number** field.



If you have a tool changer, this number should correspond with the position of the tool in the CNC machine.

- h Leave all other settings on the **V-Bit Carving** panel as the defaults and click **Calculate Now** to calculate the toolpath. The calculated toolpath is named *V-Bit Carving* toolpath by default, and is displayed in the **3D View** window:



- 7 On the **V-Bit Carving** panel's header, click  to close the panel.

Cutting out the sign

You can now calculate the toolpath needed to cut out the *Saw Mill* sign from the sheet of material during the machining process. The settings within the toolpath are applied to the outermost vector amongst the artwork shown in the **2D View** window.

- 1 Press the **F2** key to display the **2D View** window.
- 2 In the **2D View** window, select the outermost vector.



It is shown in magenta and surrounded by a bounding box, indicating that it is ungrouped and selected.

- 3 In the **2D Toolpaths** area of the **Toolpaths** panel, click **Create**



Profile Toolpath in the **2D Toolpaths** area. This displays the **Profiling** panel.

- 4 In the **Profiling** panel:
- a Select **Outside** in the **Profile** list.
 - b Enter an **Allowance** of **0**.
 - c Enter a **Start Depth** of **0**.
 - d Enter a **Finish Depth** of **25** mm (**1** inch).
 - e Enter a **Tolerance** of **0.025** mm (**0.001** inches).
 - f In the **Profiling Tool** area, click the control bar to display the **Tool Database**.
 - g In the **Wood or Plastic > Roughing and 2D Finishing** tool group, double-click the *End Mill 10 mm (End Mill 3/8 Inch)* tool. This closes the **Tool Database** and displays the tool's description in the **Profiling Tool** area.
 - h In the **Profiling Tool** area, click the tool's description to display its machining parameters, and ensure that the **Tool Number** field is set as **1**.







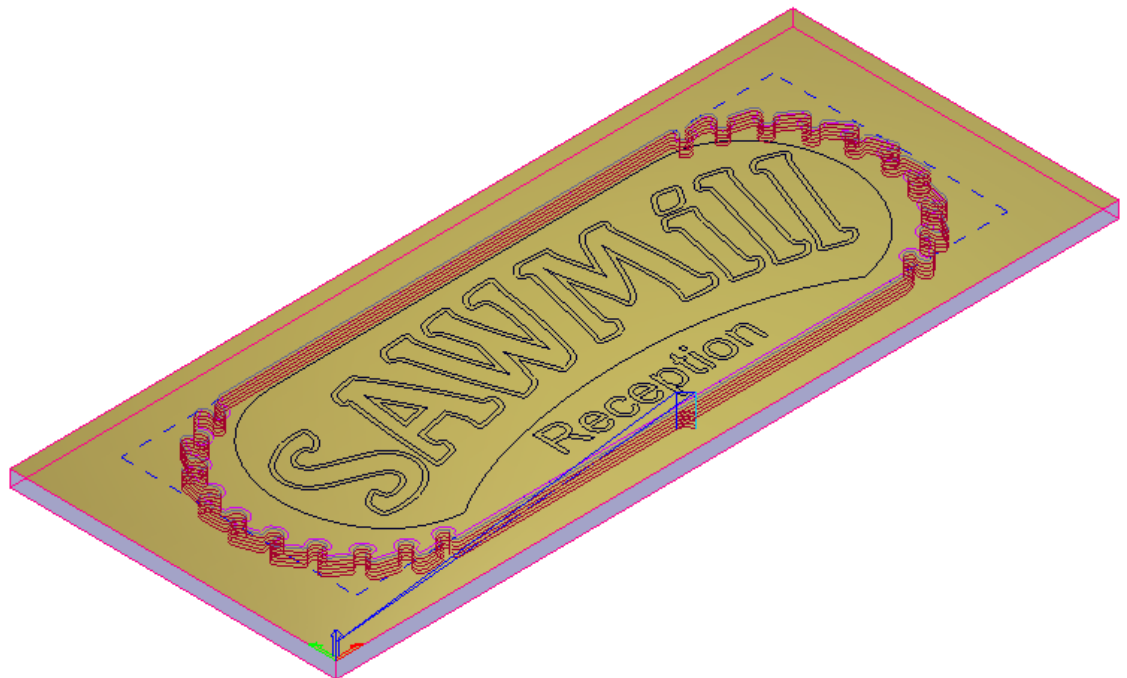
If you have a tool changer, this number corresponds with the position of the tool in the CNC machine. The Profile toolpath uses the same tool as that used in the Area Clear toolpath; therefore you can set the tool number here so that it is identical in both of these toolpaths.

- a Set the **Cutting Direction** to **Climb**.
- b Select **Add Lead In Moves**. Its settings are displayed.
- c Select **Circular Arc**. This instructs the Profiling tool to lead into the vector's boundary in an arc motion. The arc lead move is positioned at the start node in the toolpath. The start point in the toolpath is equal to the start node in the selected vector.
- d In the **Distance (D)** field, enter a value of **15**. This sets the distance from the toolpath at which you want the Profiling tool to cut into and retract from the vector's boundary.
- e In the **Radius (R)** field, enter a value of **15**. This specifies the arc lead-in move's radius.
- f Deselect **Add Bridges**.
- g Deselect **Add Ramping Moves**.

- h Click **Calculate Now** to calculate the toolpath. The calculated toolpath is named *Profile* by default, and is displayed in the **2D View** window:




- i On the **Profiling** panel's header, click  to close the panel.
- 5 In the **Project** panel, click  and  to the right of the  *V-Bit Carving* toolpath in the Project Tree. This hides the toolpath in the **2D View** and **3D View** window.
- 6 Press the **F3** key to display the **3D View** window. The calculated *Profile* toolpath is shown as follows:



Simulating the toolpaths

You are now ready to simulate all three of the calculated toolpaths, render the resulting toolpath simulation, and then delete the surplus material from the simulation.


- 1 In the **Project** panel, click the  **Toolpaths** item to display the **Toolpaths** panel below the splitter bar.
- 2 In the **Simulation** area of the **Toolpaths** panel, click **Simulate All**



Toolpaths

In the **3D View** window, the simulated *Area Clear*, *V-Bit Carving* and *Profiling* toolpaths are shown as follows:




- 3 In the **Project** panel, click the  **Simulation** item to display the **Simulation** panel below the splitter bar.
- 4 In the **Rendering** area of the **Simulation** panel:
 - a Select **Depth Colour**, then click the brown swatch in the colour palette displayed below the **3D View** window:



- b Click the **Material** list then select **Light Oak (H)**.

- c Click **Apply**. The toolpath simulation in the **3D View** window is rendered as if the *Saw Mill* sign were machined and then painted:



- 5 In the **Simulation** panel, click **Delete Waste Material**  to display the **Tool Settings: Delete Waste Material** panel.
- 6 On the **Tool Settings: Delete Waste Material** panel, select **Keep picked material**.
- 7 In the **3D View** window, click an area of the toolpath simulation shaded in solid brown. The toolpath simulation looks as follows:






- 8 Press the **Esc** key to close the **Tool Settings: Delete Waste Material** panel and re-select the **Select** tool.

Saving the toolpaths

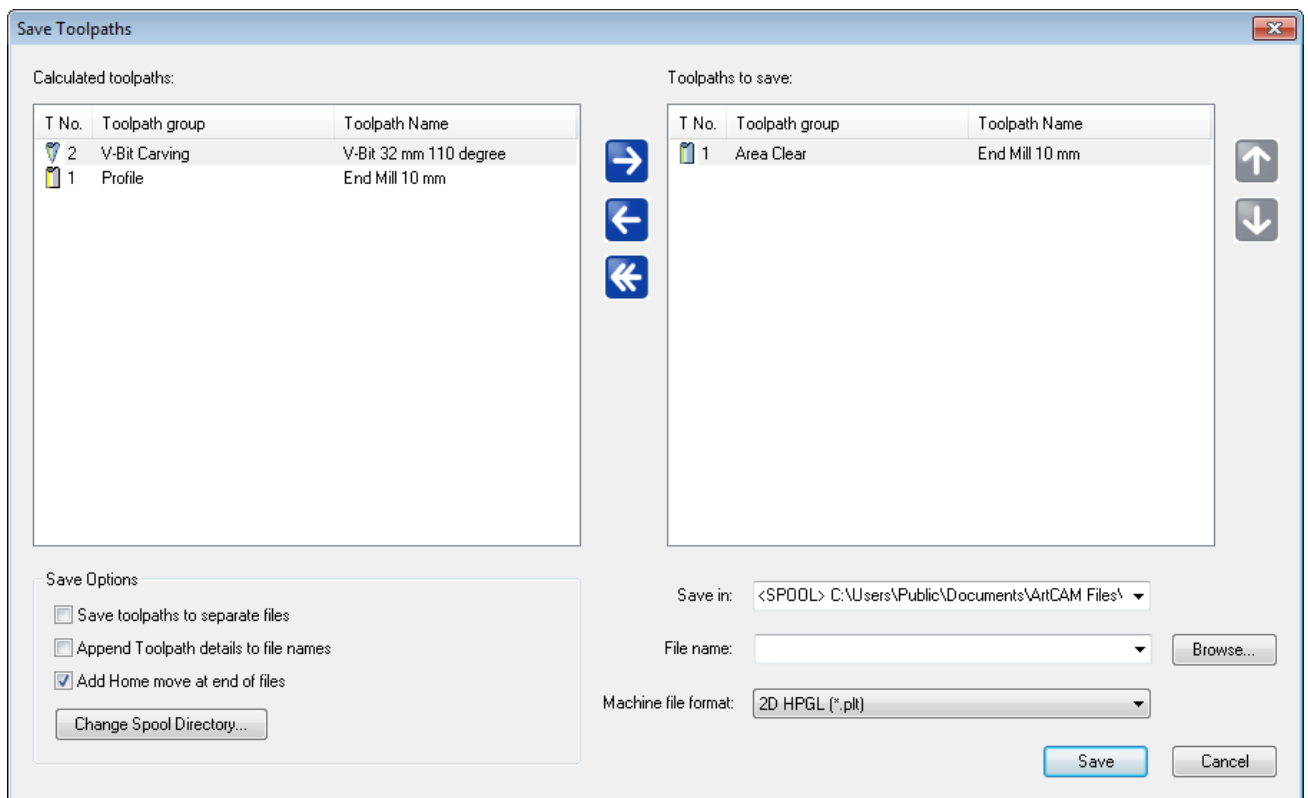
You are now ready to save the calculated toolpaths so you can machine the *Saw Mill* sign.

You will save the toolpaths in separate files, grouping together those that use the same tool. Both the *Area Clear* and *Profile* toolpaths share the same tool number because they both use the *End Mill 10 mm (End Mill 3/8 Inch)* tool.


- 1 In the **Project** panel, click  beside  *Area Clear* in the Project Tree, and then click  *End Mill 10 mm (End Mill 3/8 Inch)*. Its name is highlighted, and its associated tools are displayed below the splitter bar.

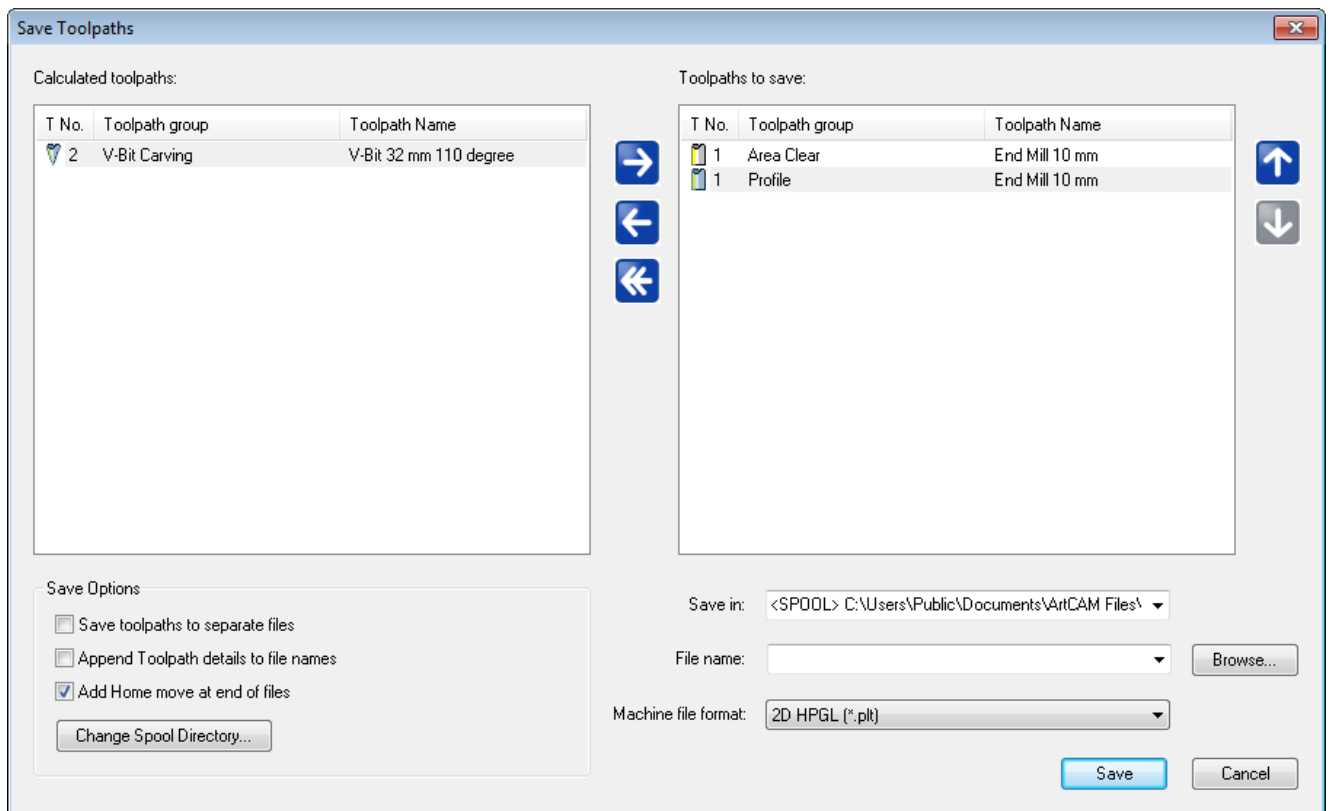
- 2 In the **Toolpath Operations** area of the **Toolpaths** panel, click **Save**


 **Toolpaths**. This displays the **Save Toolpaths** dialog.




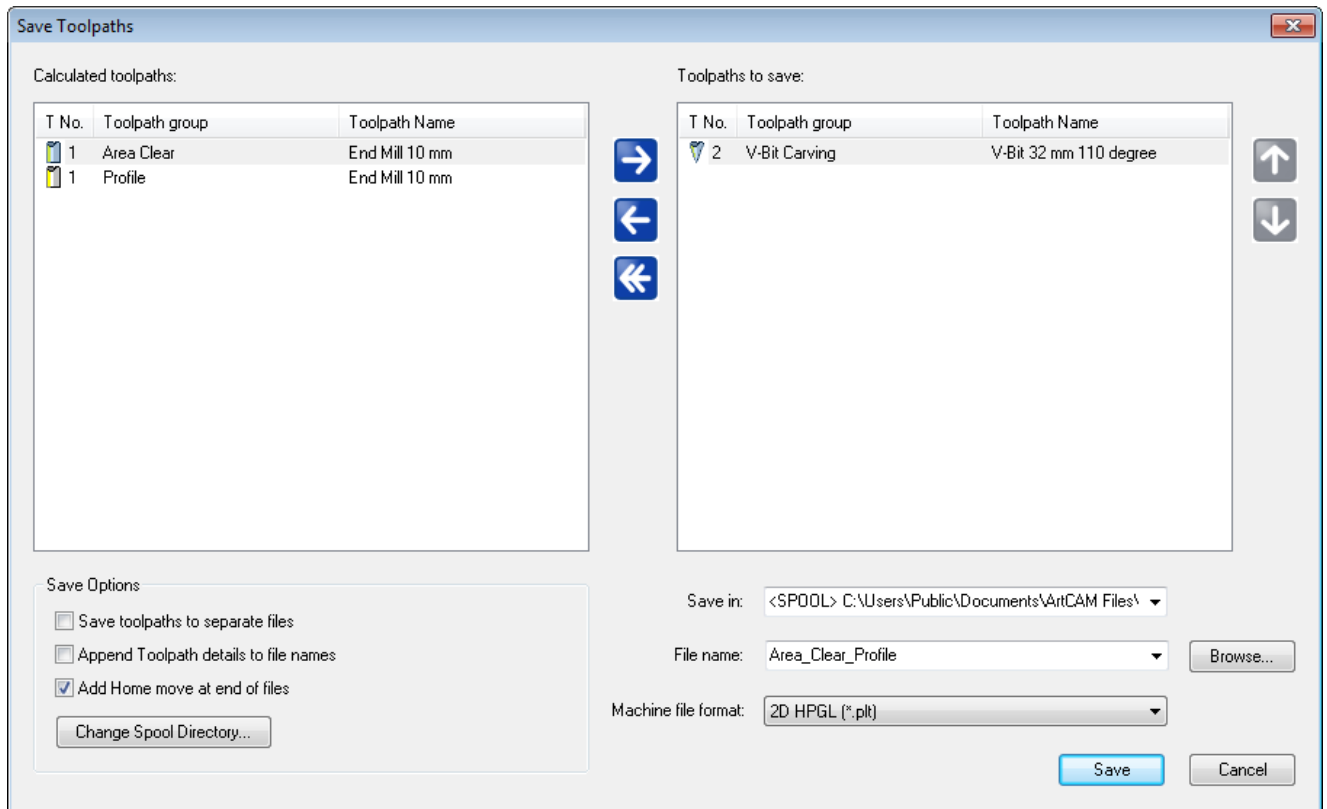
- 3 In the **Calculated toolpaths** window, select the *Profile - End Mill 10 mm (End Mill 3/8 Inch)* toolpath. Its name is highlighted.

- 4 Click  to move the toolpath to the **Toolpaths to save** window:



- 5 Click the **Machine file format** list, then select the machine format in which you want to save your toolpath file.
- 6 In the **File name** field, type **Area_Clear_Profile**, and then click **Save** to save the toolpath file to the Spool Directory.
- 7 Click  to return the toolpaths in the **Toolpaths to save** window to the **Calculated toolpaths** window.
- 8 In the **Calculated toolpaths** window, ensure the *V-Bit Carving - V-Bit 32 mm 100 degree (V-Bit 1.25 Inch 110 degree)* toolpath is selected by clicking its name. Its name is highlighted.

- 9 Click  to move the toolpath to the **Toolpaths to save** window:



- 10 In the **File name** field, type **Carving**, and then click **Save** to save the toolpath file to the Spool Directory.

- 11 Click **Cancel** to close the **Save Toolpaths** dialog.

You are now ready to send the toolpath files to your CNC machine to manufacture the *Saw Mill* sign.

Tutorial - Lizard

This tutorial demonstrates how to machine a piece of relief clipart. You will import a lizard relief from ArtCAM Express's **Relief Clipart Library**, and then create the 3D toolpaths needed to machine the lizard relief.


The stages covered by this tutorial are:

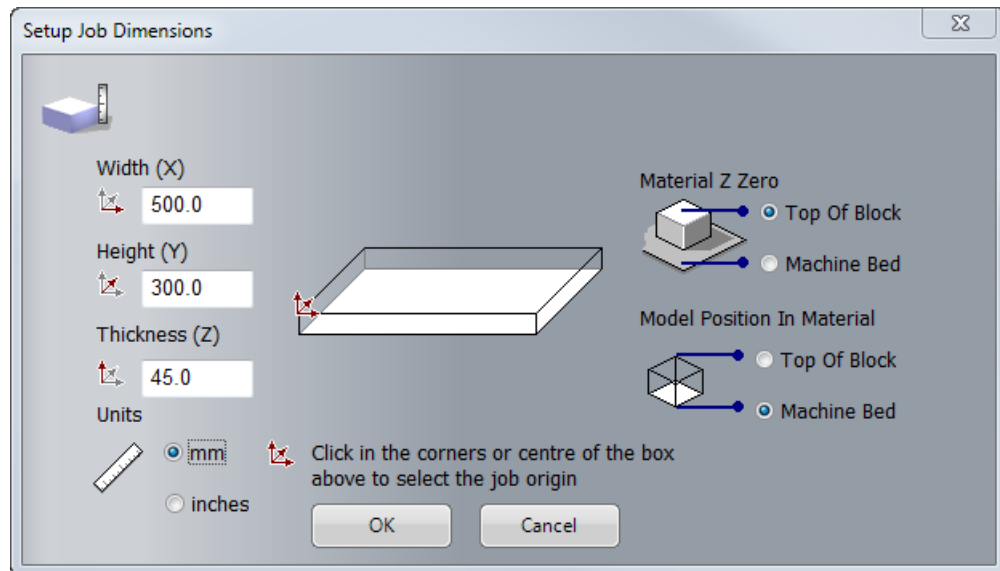
- Preparing the model (see page 67).
- Importing the relief clipart (see page 68).
- Calculating the toolpaths (see page 72).
- Simulating the toolpaths (see page 78).
- Saving the toolpaths (see page 80).

At the end of this tutorial, you will have created all of the toolpath files needed to machine a lizard relief using ArtCAM Express.

Preparing the model

Begin by creating a new ArtCAM model.

- 1 In the **Start** panel, click  **New Model**. This displays the **Setup Job Dimensions** dialog.




- 2 In the **Units** area, select **mm**.
- 3 In the **Width (X)** field, enter **500**.
- 4 In the **Height (Y)** field, enter **300**.
- 5 In the **Thickness (Z)** field, enter **45**.
- 6 In the **Material Z Zero** area, select **Top Of Block**.
- 7 In the **Model Position In Material** area, select **Machine Bed**.
- 8 Set the job origin as the bottom left corner of the model by clicking that corner of the box diagram.
- 9 Click **OK** to close the dialog and create a model according to these dimensions.

In the **2D View** window, the white model area represents the block of material when viewed down the Z-axis.

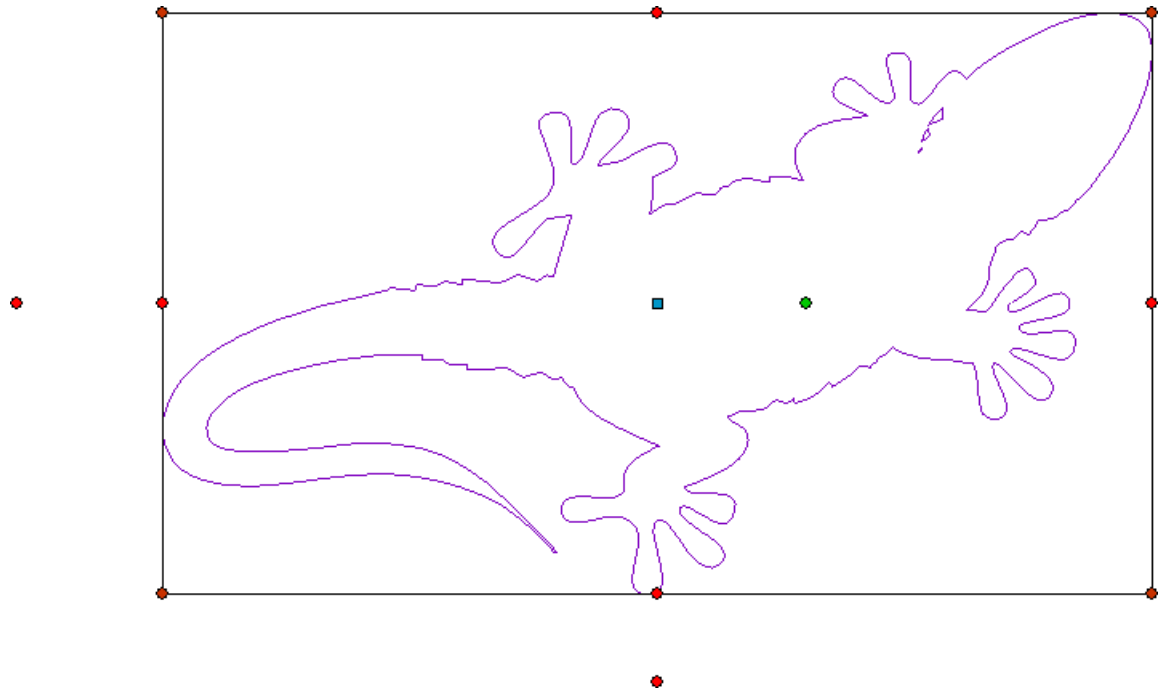
Importing the relief clipart

You are now ready to import a piece of relief clipart into the model.

- 1 In the **Relief Creation** toolbar, click **Relief Clipart Library** . The **Relief Clipart Library** panel is displayed.
- 2 In the **Relief Clipart Library** panel, click the **Choose Library** list, then select **Animals** to display thumbnails of its associated selection of relief clipart.
- 3 Click the **Lizard** thumbnail to import the lizard relief clipart.



The **Tool Settings: Transform** panel is displayed, and the lizard relief clipart's outline is shown in the **2D View** window:



The lizard relief clipart's outline is purple and surrounded by a bounding box; indicating it is grouped and selected. You can also see:

- the blue transform origin within the outline;
- the green rotation handle within the outline, which you can use to rotate the relief clipart;

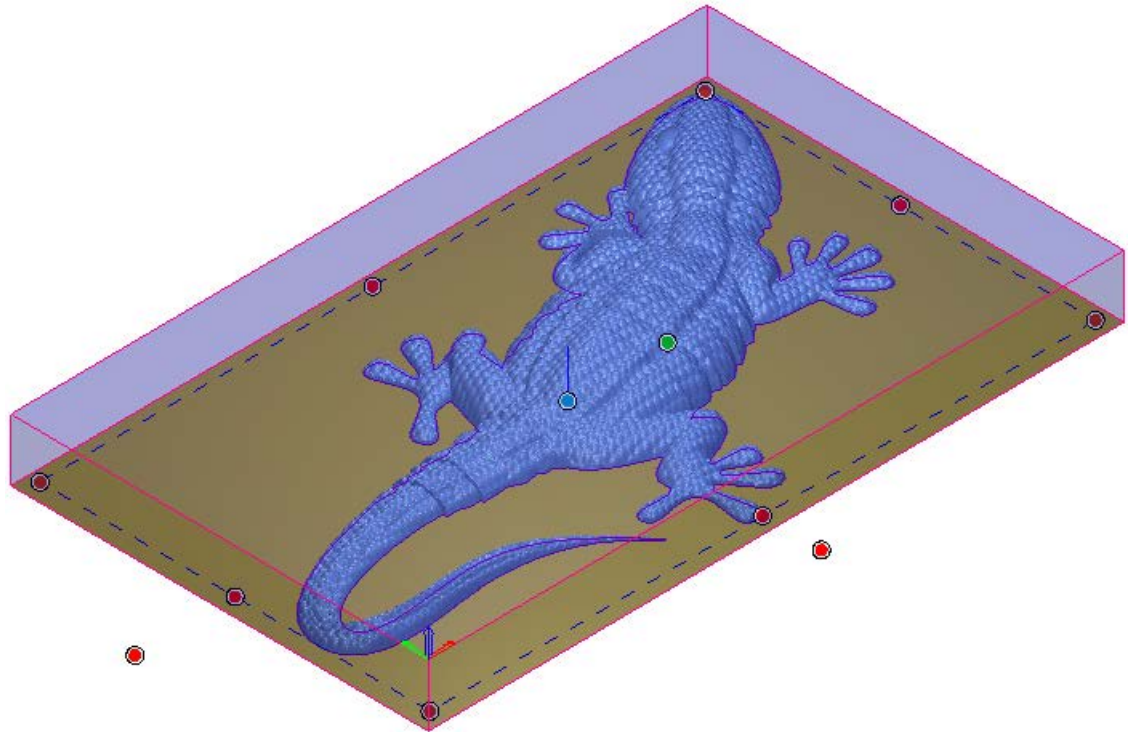
- red resizing handles on each edge of the bounding box; and
- two red shearing handles outside the left and bottom edges of the bounding box.

4 Press **F3** to display the **3D View** window.





5 In the **3D View** toolbar, click **Toggle Vector Visibility**



In the **3D View** window, the lizard preview relief and its outline are shown:




The lizard review relief's outline is purple and surrounded by a bounding box; indicating it is grouped and selected. You can also see:

- a transform origin  within the outline;
- a rotation handle  within the outline, which you can use to rotate the relief clipart;
- resizing handles  on each edge of the bounding box; and
- two shearing handles  adjacent to the left and bottom edges of the bounding box.

6 Press **F3** to display the **3D View** window.

7 On the **Relief Clipart Library** panel's header, click  to close the panel.

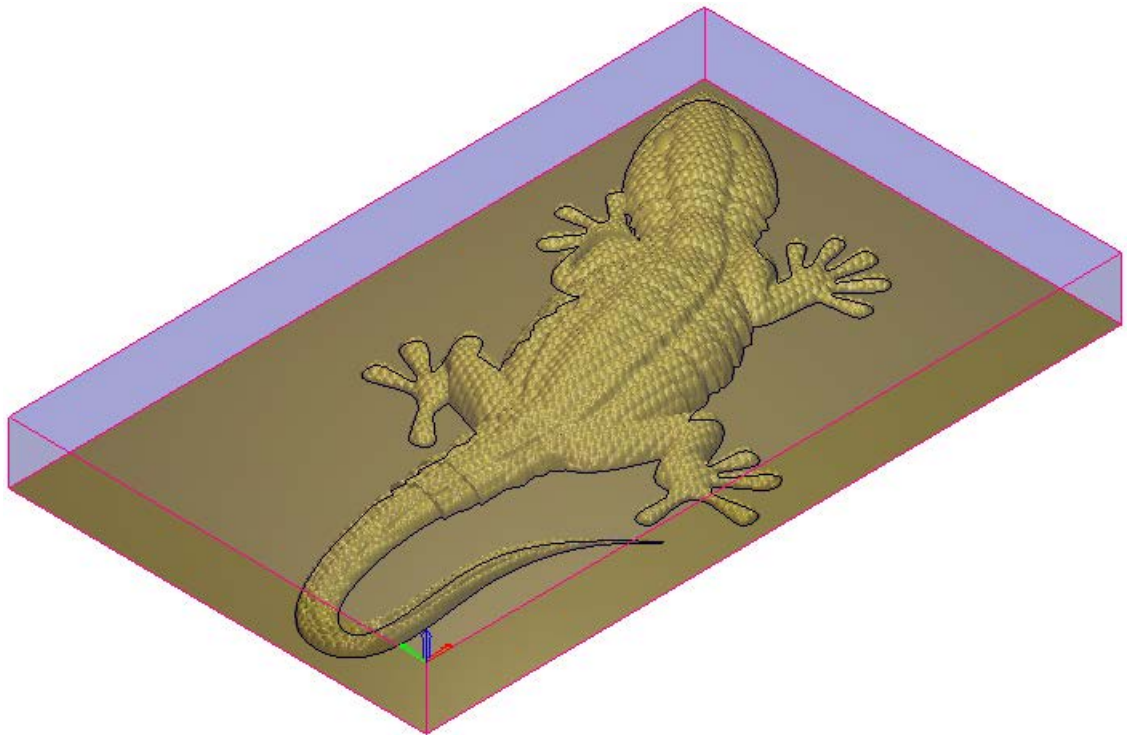
- 8 In the **Tool Settings: Transform** panel, click **Relief Clipart Paste**

Options  to display the paste options.


- 9 In the **Paste Combine Mode** area:

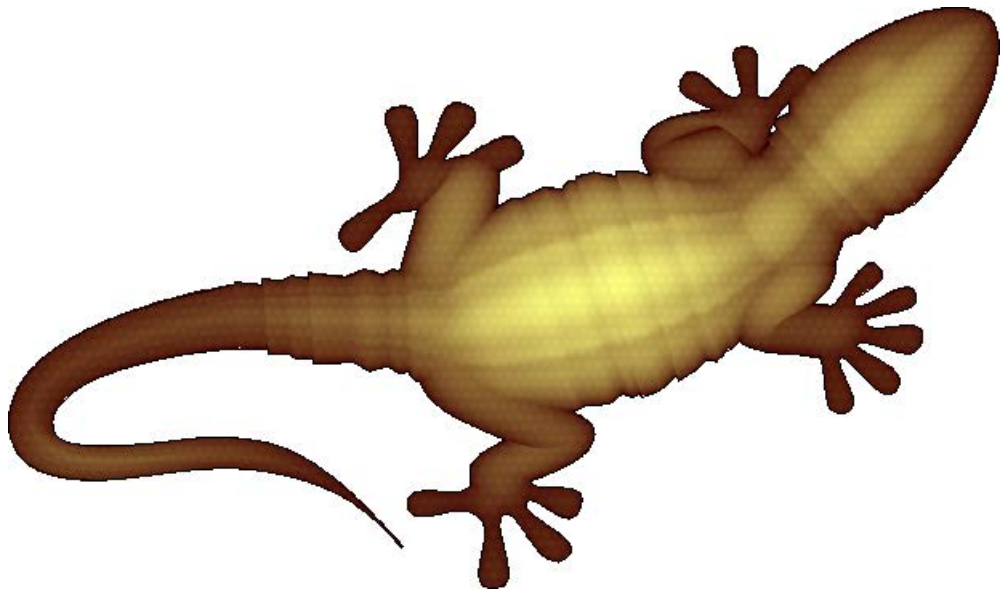
- a Select **Add**.
- b Select **Paste outline vector**.

- 10 Click **Paste** to paste the lizard relief clipart into the relief. The lizard relief clipart's outline is also pasted into the model area as a vector boundary. It is black and deselected.



- 11 Press **F2** to display the **2D View** window.


- 12** In the **2D View** toolbar, click **Toggle Relief Preview**  to display a greyscale image of the relief in the **2D View** window:



- 13** Click **Toggle Relief Preview**  again to hide the greyscale image of the relief.

Calculating the toolpaths

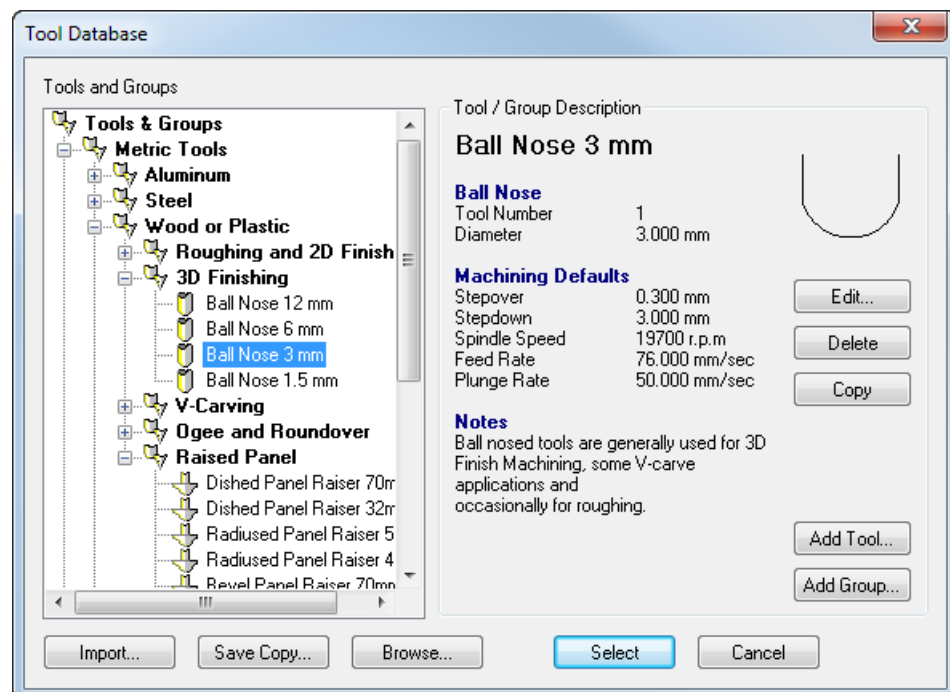
You are now ready to create and calculate two toolpaths. The first is used to machine the whole of the relief, and the second to machine only the area of the relief within the lizard relief clipart's vector boundary.

- 1 Press **F3** to display the **3D View** window.
- 2 In the **Project** panel, select  **Toolpaths** in the Project Tree. This displays the Toolpaths panel below the splitter bar.
- 3 In the **3D Toolpaths** area of the **Toolpaths** panel, click **Create**



Machine Relief Toolpath to display the **Machine Relief** panel.

- a In the **Area to Machine** area, select **Whole Relief**.
- b Click the control bar in the **Finishing Options** area to display the **Tool Database**.
- c In the **Wood or Plastic > 3D Finishing** tool group, double-click the **Ball Nose 3 mm** tool:



The **Tool Database** closes and the tool's description is displayed on the control bar.

- d Click the **Tool clearance strategy** list then select **Raster (Classic)**.
- e Enter an **Angle** of **0**.
- f Enter a **Tolerance** of **0.01**.

- g** Enter an **Allowance** of **0.1**.
- h** Click the **Multiple Z Passes** control bar to display its settings.
- i** Select **Do Multiple Z Passes**.
- j** In the **Start Z** field, enter **-3**.



*This value is equal to the **Max Z** height of the material block less the **Stepdown** associated with your selected tool.*

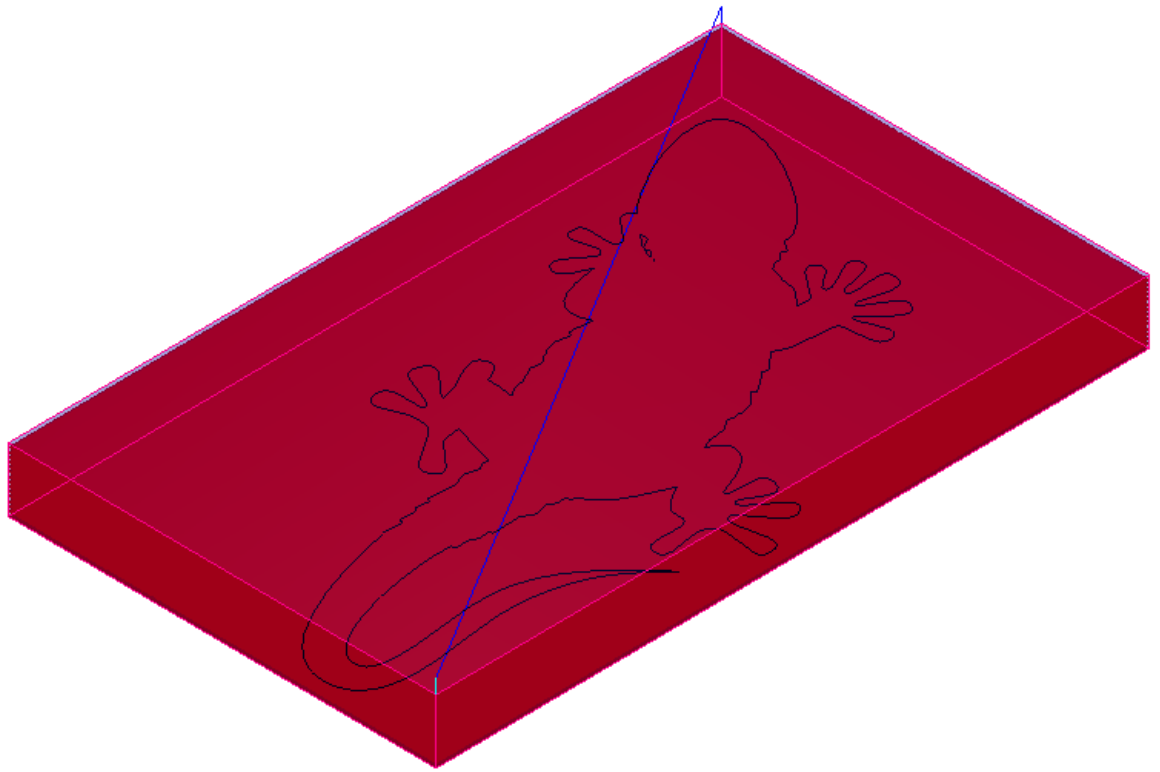
The number of passes made between the Z height of the first and last pass is decided by the **Stepdown** associated with your selected tool.








*If you cannot see the **Stepdown** associated with your selected tool, click the control bar displaying the tool's description in the **Finishing Tool** area to show its parameters.*

- k** In the **Finish Z** field, enter **-45**.
- l** In the **Options** area, click the second control bar to display the **Safe Z** field and the **Home Position's X, Y and Z** fields.
- m** In the **Safe Z** and **Home Position's Z** field, enter **10**.
- n** Click the control bar to hide the **Safe Z** field and the **Home Position's X, Y and Z** fields.
- o** In the **Name** field, type **Machine Relief**.
- p** Click **Calculate Now** to calculate the toolpath.

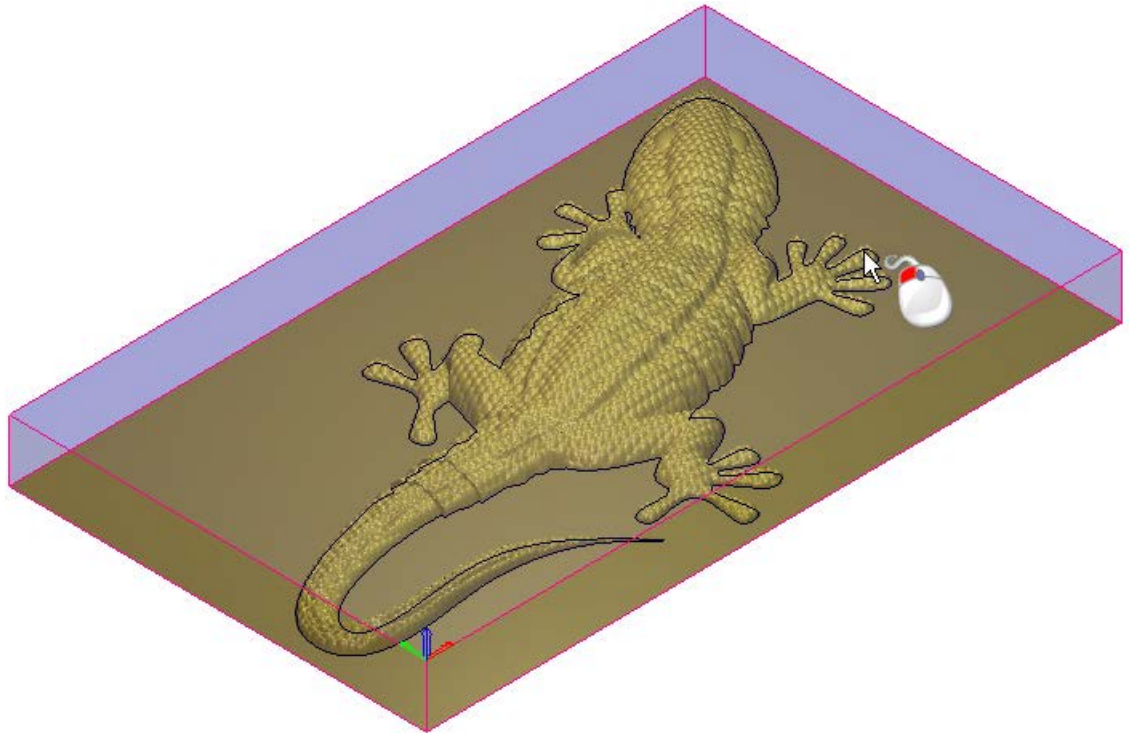
In the **3D View** window, the calculated *Machine Relief* toolpath is shown as follows:



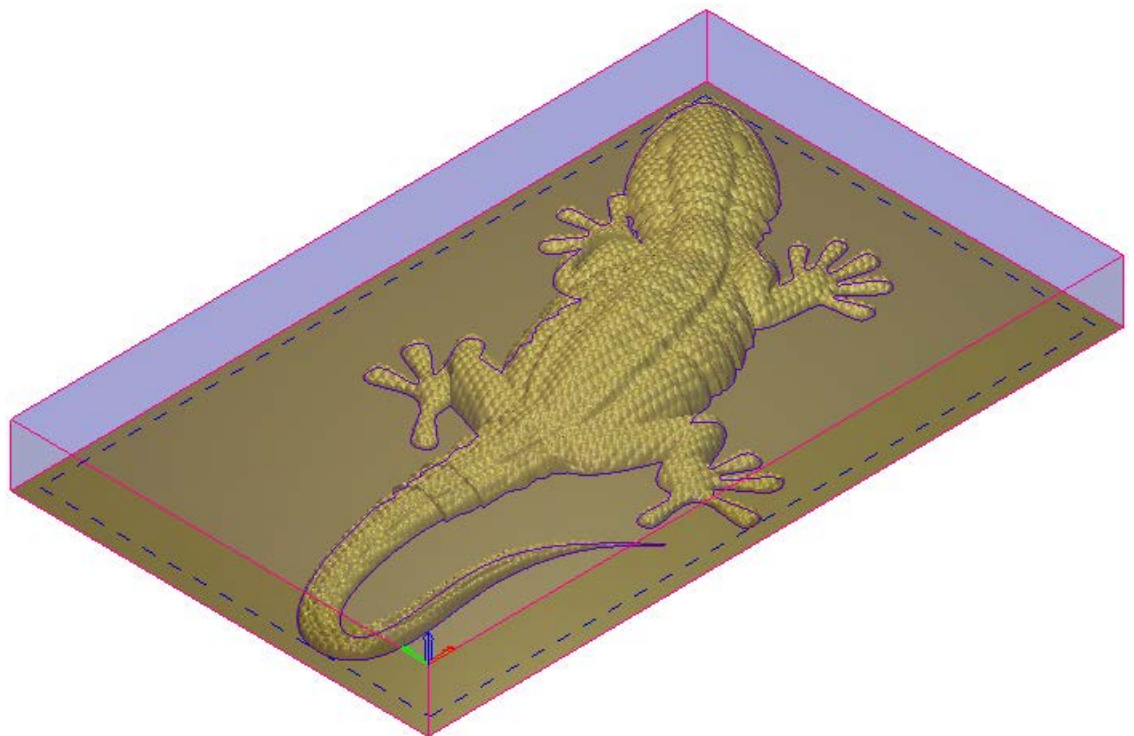
You can use the **Zoom**  button in the **3D View** toolbar to view the machining passes in more detail. After clicking the button, position the magnifying cursor over the area of the toolpath on which you want to focus, click and drag to create a bounding box surrounding the area of the toolpath, and then release the mouse button to zoom on the area within the bounding box.

- 4 In the **Project** panel, click  beside the  **Toolpaths** item in the Project Tree. The calculated  *Machine Relief* toolpath is now shown.
- 5 In the **Project** panel, click the light bulb  icon beside the *Machine Relief* toolpath in the Project Tree. The *Machine Relief* toolpath is hidden in the **3D View** window.

- 6 In the **3D View** window, select the lizard relief clipart's vector boundary.



The vector is shown in purple and surrounded by a bounding box; indicating it is both grouped and selected.



- 7 On the **Machine Relief** panel:
- a Click the **Area to Machine** list then select **Selected Vectors**.
 - b Select **Inside Vector**.

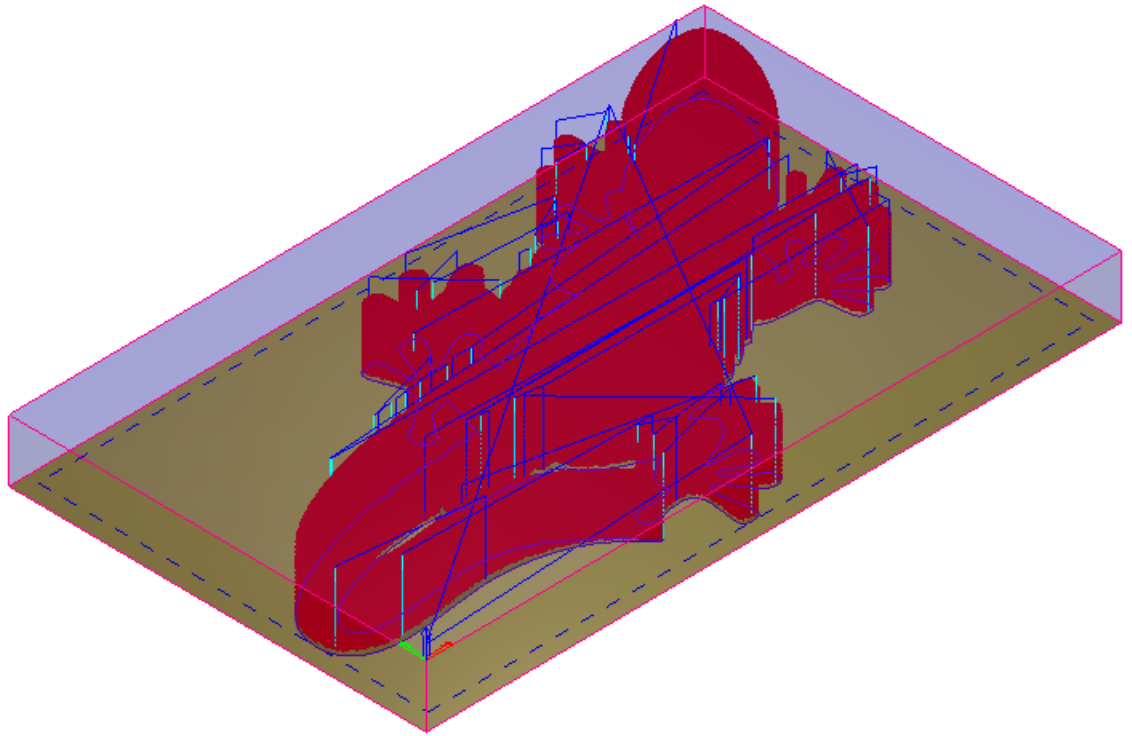
- c In the **Finishing Options** area, click the control bar to display the parameters associated with the currently selected tool.
- d Click **Select** to display the **Tool Database**.
- e In the **Wood or Plastic > 3D Finishing** tool group, double-click the **Ball Nose 1.5 mm** tool. The **Tool Database** closes and the tool's description is displayed on the control bar.
- f Select **Raster (Classic)**.
- g Enter an **Angle** of **0**.
- h Enter a **Tolerance** of **0.01**.
- i Enter an **Allowance** of **0.1**.
- j Select **Do Multiple Z Passes**.
- k In the **Start Z** field, enter **-1.5**.





*This value is equal to the **Max Z** height of the material block less the **Stepdown** associated with your selected tool.*

- l In the **Finish Z** field, enter **-45**.
- m In the **Options** area, click the second control bar to display the **Safe Z** field and the **Home Position's X, Y and Z** fields.
- n In the **Safe Z** and **Home Position's Z** field, enter **10**.
- o Click the control bar to hide the **Safe Z** field and the **Home Position's X, Y and Z** fields.
- p In the **Name** field, enter **Machine Relief 1**.
- q Click **Calculate Now** to calculate the toolpath.

In the **3D View** window, the calculated *Machine Relief 1* toolpath is shown as follows:




*Rapid moves within the toolpath are shown in blue, while plunge moves are shown in cyan. You can toggle the display of these moves in the **3D View** window using the **Toolpaths > Toolpath Drawing > Draw Rapid and Plunge Moves** option from the **Main Menu** bar.*

On the **Project** panel, the calculated  *Machine Relief 1* toolpath is listed below the  *Machine Relief* toolpath in the Project Tree.

- 8 Click  on the **Machine Relief** panel's header to close it.

Simulating the toolpaths

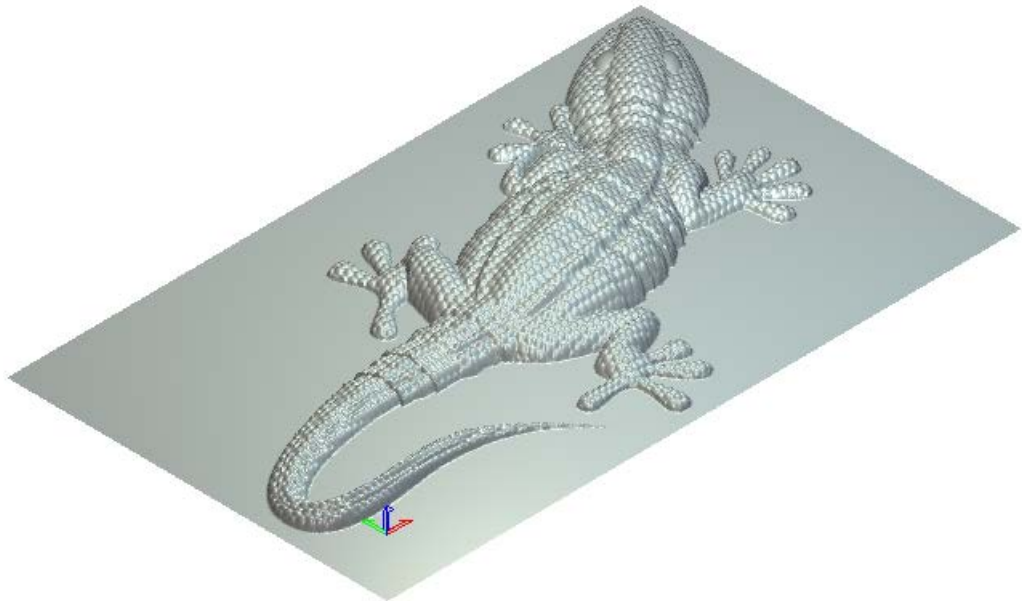
You are now ready to simulate both of the calculated toolpaths, and then render the resulting toolpath simulation using a shading set.



- 1 In the **Project** panel, click the  **Toolpaths** item in the Project Tree to display the **Toolpaths** panel below the splitter bar.
- 2 In the **Simulation** area of the **Toolpaths** panel, click **Simulate All**



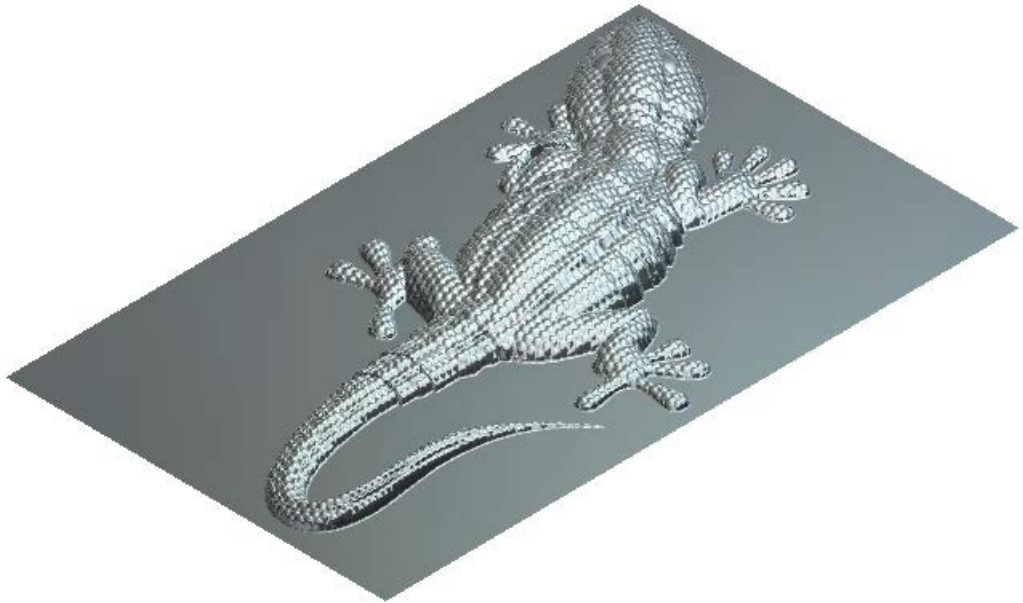
Toolpaths

In the **3D View** window, the simulated *Machine Relief* and *Machine Relief 1* toolpaths are shown as follows:



- 3 In the **3D View** toolbar, click **Origin**  to hide the origin gnomon in the **3D View** window.
- 4 In the **Project** panel, select the  **Simulation** item in the Project Tree to display the **Simulation** panel below the splitter bar.
- 5 In the **Rendering** area of the **Simulation** panel, click:
 - a Click the **Material** list, then select **Platinum**.


- b Click **Apply**. The toolpath simulation in the **3D View** window is rendered as if the lizard were cast in platinum:

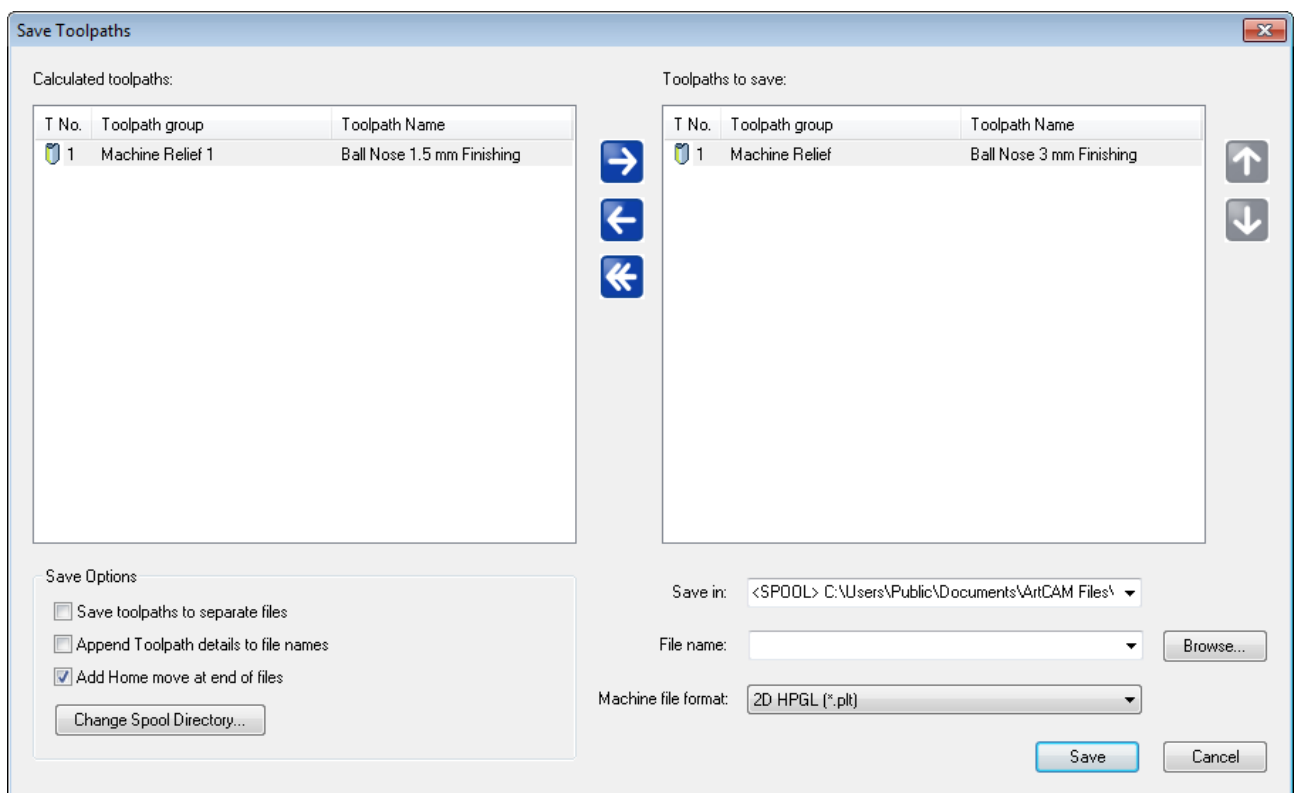



Saving the toolpaths


You are now ready to save your calculated toolpaths so that you can machine the lizard relief. Each of the toolpaths will be saved as separate files.

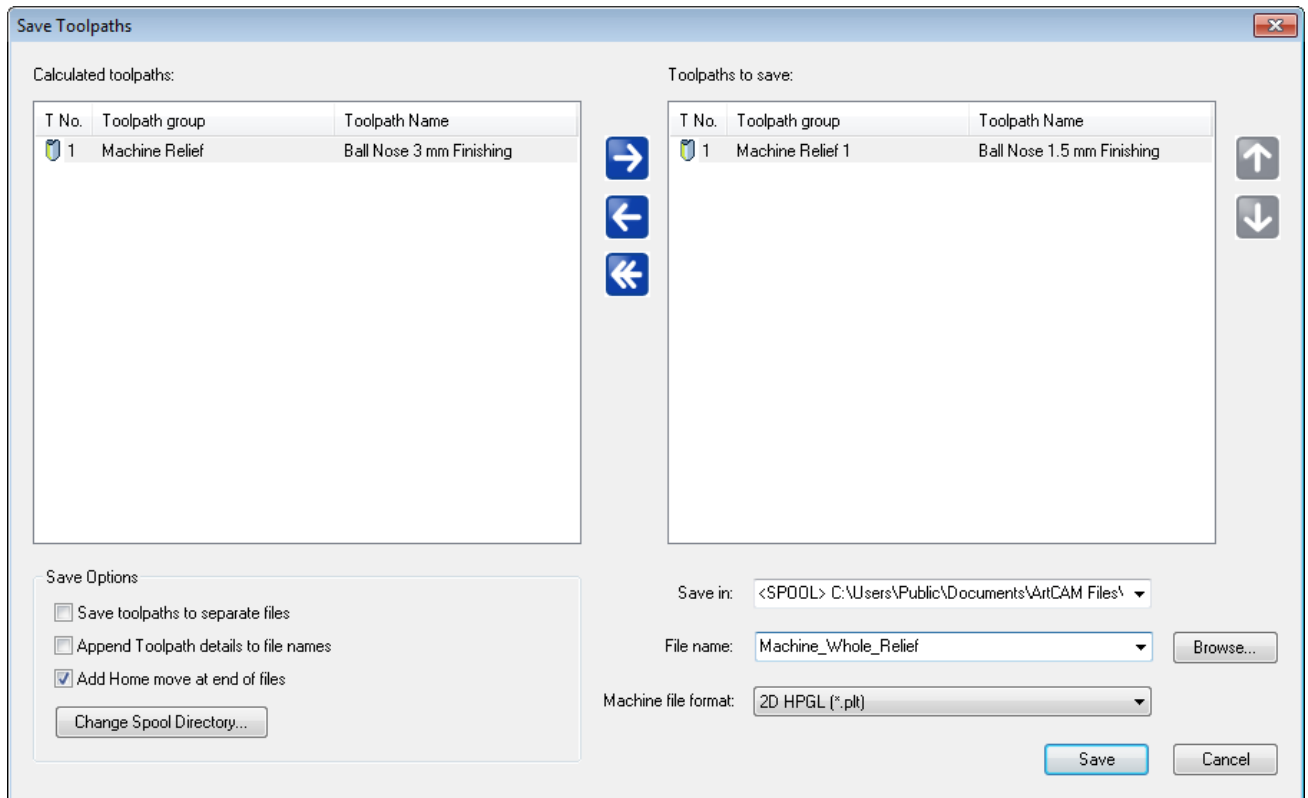
- 1 In the **Project** panel, select the  *Machine Relief* toolpath in the Project Tree to display its panel below the splitter bar.

- 2 Click **Save Toolpaths** . This displays the **Save Toolpaths** dialog:



- 3 Ensure that the *Machine Relief - Ball Nose 3 mm Finishing* toolpath is shown in the **Toolpaths to save** window.
- 4 Click the **Machine file format** list, then select the machine format in which you want to save your toolpath file.
- 5 In the **File name** field, enter **Machine_Whole_Relief**, and then click **Save** to save the toolpath file to the Spool Directory.
- 6 Click  to move the *Machine Relief - Ball Nose 3 mm Finishing* toolpath to the **Calculated toolpaths** window.
- 7 Select the *Machine Relief 1 - Ball Nose 1.5 mm Finishing* toolpath in the **Calculated toolpaths** window.

- 8 Click  to move the toolpath to the **Toolpaths to save** window:



- 9 In the **File name** field, enter **Machine_Lizard_Only**, and then click **Save** to save the toolpath file to the Spool Directory.

- 10 Click **Cancel** to close the **Save Toolpaths** dialog.

You are now ready to send the toolpath files to your CNC machine to manufacture the lizard.

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