

Getting Started



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The functionality and user interface in this manual is subject to change without notice in future revisions of the software.

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Acknowledgements

This documentation references a number of registered trademarks and these are the property of their respective owners. For example, Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States.

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"

The Support structure functionality is subject to patent applications.

Patent application: US 14325878 Method for calculating support structures and support elements for attaching a support strut of same

Patent application: GER 10 2013 011 630.9 Method for calculating support structures and support elements for attaching a support strut of same

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Getting Started in ArtCAM

The ArtCAM family is a range of unique and scalable artistic CAD/CAM software solutions used in a wide variety of industries worldwide. It provides the functionality to entirely design and RP, CNC or laser machine a number of 2D and 3D products. It is used to make signs, furniture, and sculptures as well as being a vital design and manufacturing resource in applications such as product design, packaging and engraving for the minting and print industries, amongst many others.

The range includes:

- **ArtCAM Express** — Entry level CAD/CAM software for hobbyists and small businesses.

ArtCAM Express is an affordable entry level product that contains a variety of 2D design and 2D/3D machining features. A good starting point for any new router owner; you can also add more features to your software as you need them.

- **ArtCAM Insignia** — Introductory 3D design and manufacturing.

ArtCAM Insignia is the mid-range product in ArtCAM's artistic CAD/CAM software range. Extending the functionality of ArtCAM Express, ArtCAM Insignia features an expanded toolkit specifically for repeat designs in a production environment and introductory 3D design tools.

- **ArtCAM Pro** — Advanced 2D and 3D design and manufacturing.

Our professional software package gives you the power to design and manufacture premium quality 3D models or 3D sculpted reliefs quickly and easily.

- **ArtCAM JewelSmith** — Professional jewellery design and manufacture.

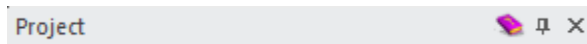
ArtCAM JewelSmith combines the 2D and 3D design and manufacturing capabilities of ArtCAM Pro with extensive jewellery specific tools and libraries to create highly custom personalised jewellery pieces through to new complete lines.

Finding out more about ArtCAM

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

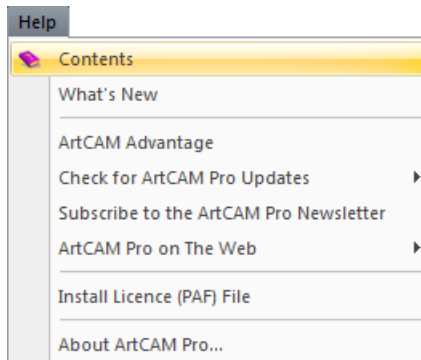
- Inline-help.

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



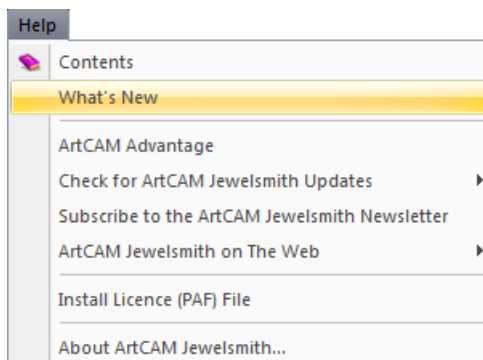
- The ArtCAM Reference Help system.

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



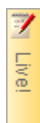
- The ArtCAM What's New system.

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



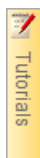
- The **Live!** panel.

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 **Start** panel.

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

- The ArtCAM website.

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

- The ArtCAM User Forum.

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



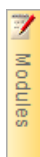
*If you have not yet registered as a forum member, click the **Register** option on the forum's home page to do so. Registered users are able to download images, example ArtCAM models and relief clipart files attached to posts.*

- Subscribe to the ArtCAM Newsletter.

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

If you are working in ArtCAM Express, you can find out information about the available modules in the **Modules** panel.

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

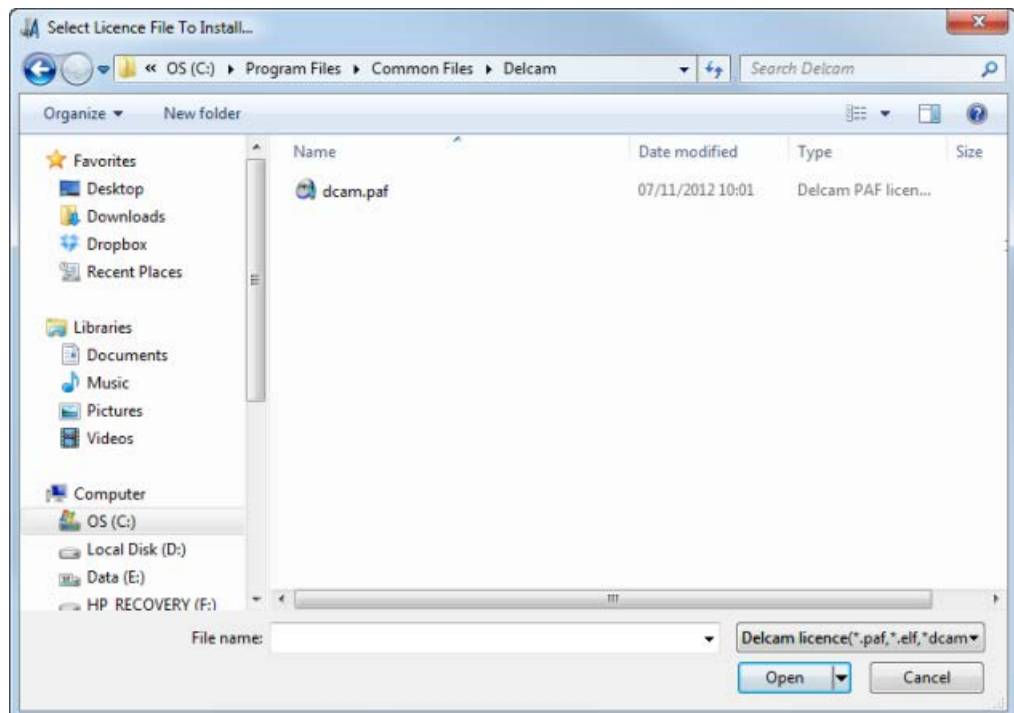


Installing your ArtCAM licence

In order to use ArtCAM, you must ensure that a valid licence is installed. This licence can be installed as one of three file types: a PAF file ([dcam.paf](#)), a Delcam Licence file ([dcam.dcamlic](#)), or an ELF file ([dcam.elf](#)).

If you have installed ArtCAM from a disc and have a dongle, your licence should have been emailed to you. To install your licence:

- 1 Plug the dongle into your computer.
- 2 Start ArtCAM. A dialog is displayed asking if you want to install a new licence.
- 3 Follow the on-screen instructions to display the **Select Licence File To Install** dialog:



- 4 Navigate to the folder on your computer in which your licence file is stored.
- 5 Select the licence file and click **Open**. The dialog closes and the licence is installed.

If you have installed a pre-registered version of ArtCAM and do not have a dongle:

- 1 Start ArtCAM. A start-up screen is displayed.
- 2 Follow the on-screen instructions to activate your product and receive your licence.

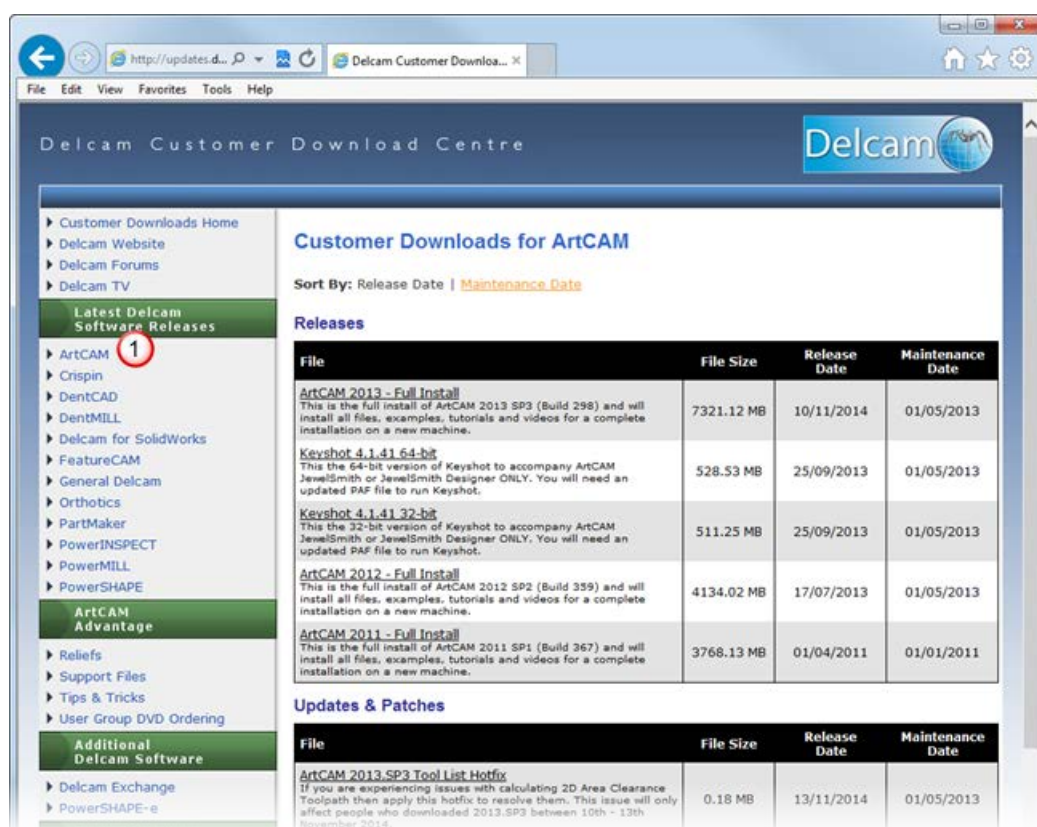
Updating ArtCAM

To check for software updates and patches from within ArtCAM:

- 1 Ensure that you are connected to the internet.
- 2 In the **Main Menu** bar, select **Help > Check For ArtCAM Updates > Software Updates**.

If there are updates available, ArtCAM displays the **Update** settings on the **Tool Settings** tab, and opens a new browser window with the **Delcam Customer Download Centre** site displayed.

- 3 In the navigation panel, select **ArtCAM** (see ①) to display the latest downloads that are available to you:



The screenshot shows a web browser window displaying the Delcam Customer Download Centre. The page has a navigation panel on the left with a tree view. The 'ArtCAM' item is selected and highlighted with a red circle and the number 1. The main content area is titled 'Customer Downloads for ArtCAM' and features two tables: 'Releases' and 'Updates & Patches'.

File	File Size	Release Date	Maintenance Date
ArtCAM 2013 - Full Install This is the full install of ArtCAM 2013 SP3 (Build 298) and will install all files, examples, tutorials and videos for a complete installation on a new machine.	7321.12 MB	10/11/2014	01/05/2013
Keyshot 4.1.41 64-bit This is the 64-bit version of Keyshot to accompany ArtCAM JewelSmith or JewelSmith Designer ONLY. You will need an updated PAF file to run Keyshot.	528.53 MB	25/09/2013	01/05/2013
Keyshot 4.1.41 32-bit This is the 32-bit version of Keyshot to accompany ArtCAM JewelSmith or JewelSmith Designer ONLY. You will need an updated PAF file to run Keyshot.	511.25 MB	25/09/2013	01/05/2013
ArtCAM 2012 - Full Install This is the full install of ArtCAM 2012 SP2 (Build 359) and will install all files, examples, tutorials and videos for a complete installation on a new machine.	4134.02 MB	17/07/2013	01/05/2013
ArtCAM 2011 - Full Install This is the full install of ArtCAM 2011 SP1 (Build 267) and will install all files, examples, tutorials and videos for a complete installation on a new machine.	3768.13 MB	01/04/2011	01/01/2011

File	File Size	Release Date	Maintenance Date
ArtCAM 2013 SP3 Tool List Hotfix If you are experiencing issues with calculating 2D Area Clearance Toolpath then apply this hotfix to resolve them. This issue will only affect people who downloaded 2013.SP3 between 10th - 13th November 2014.	0.18 MB	13/11/2014	01/05/2013

All of the available software updates and product updates are listed on this web page. In the **File** area, click a link to download its associated update or patch to your computer.

Files compatible with ArtCAM

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.



*If you are using ArtCAM Express, you can only import certain files when you have the **File Import** module.*

The ArtCAM layout

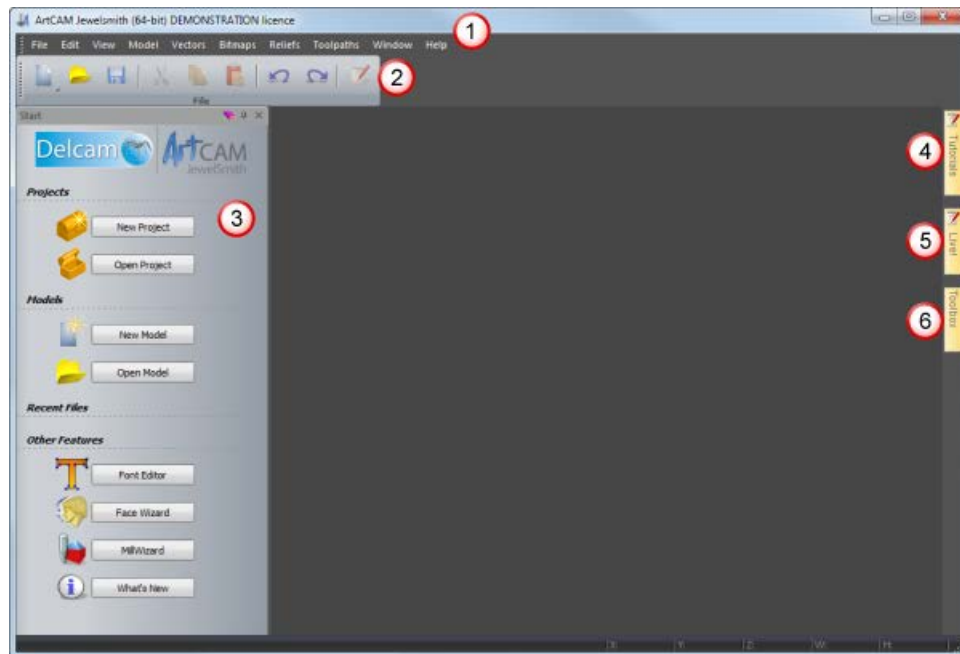
The ArtCAM layout depends on whether or not you have a model or project open.



If you are working in ArtCAM Express or ArtCAM Insignia, you cannot create or open a project.

The starting layout

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



- ① **Main Menu bar** — Select a menu item associated with a particular part of the ArtCAM's design process to display a drop-down menu of sub-menus and commands. Most of these are inactive until you create a model or project.
- ② **Top docking area** — The **File** toolbar is docked horizontally here. This enables you to create a new project or independent model, or open a previously saved project or independent model. You can also set your preferences and display the Reference Help.

- ③ **Start panel** — This docked panel enables you to create a new model or project, or open a previously saved model or project. Your recent files are listed and can be reopened. You can also start the **Font Editor** and **MillWizard** standalone tools, or use the **Face Wizard** tool to create a new model from a photographic image containing a side profile of a person's head and neck. For more information, see The Start panel (see page 32).



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



*If you are working in ArtCAM Express or ArtCAM Insignia, the **Projects** area and **Face Wizard** tool are not included.*

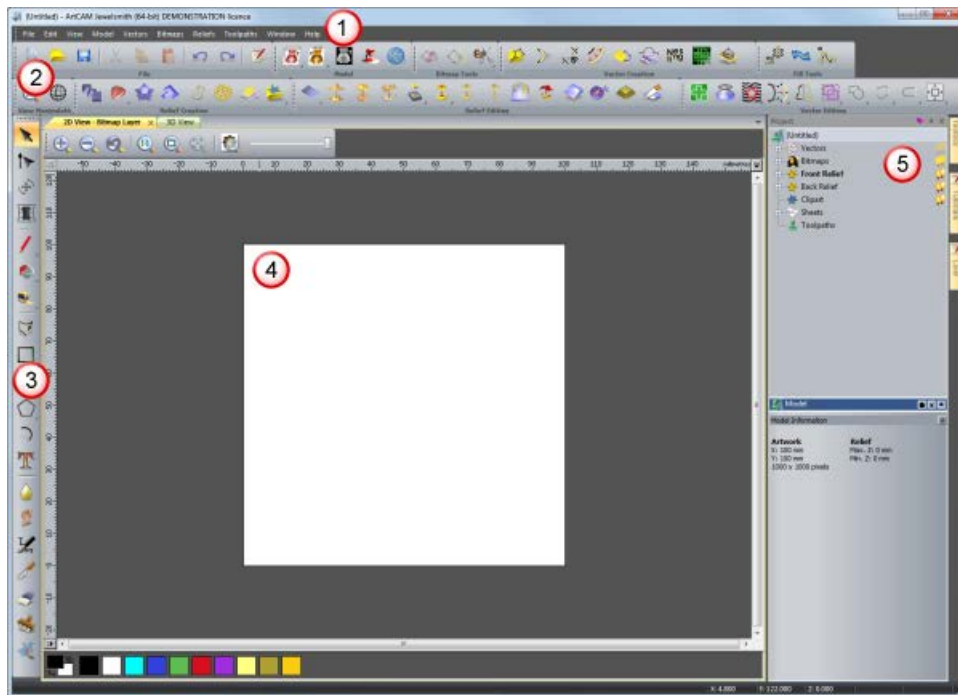
- ④ **Tutorials** — This tab displays a panel that provides information on where to download tutorial packs. Any tutorial packs included in your installation are listed.
- ⑤ **Live!** — This tab displays a panel that provides online videos you can watch to learn about working in ArtCAM.
- ⑥ **Toolbox** — This tab displays a panel that contains compatible plug-in tools. Any plug-ins included in your installation are listed.



*If you are working in ArtCAM Express, the **Toolbox** panel is replaced by the **Modules** panel, which provides information about the available modules and enables you to purchase them.*

The open model layout

When you create a new, independent model, the layout includes the following areas:



- ① **Menu Bar** — As described previously, although more sub-menus and commands are active.
- ② **Top docking area** — Eight toolbars are docked horizontally here: **File**, **Model**, **Bitmap Tools**, **Vector Creation**, **Relief Creation**, **Vector Editing**, **Relief Editing** and **Fill Tools**.

Up to four additional toolbars are hidden by default: **Simulation**, **Rotary Relief Tools**, **Gem Tools** and **Back Relief Tools**. When displayed, these are also docked.



*If you are working in ArtCAM Express or ArtCAM Insignia, the **Rotary Relief Tools**, **Gem Tools** and **Back Relief Tools** toolbars are not available. If you are working in ArtCAM Pro, the **Rotary Relief Tools** and **Gem Tools** toolbars are not available.*



*Almost all of the toolbars' tools are also available from the **Assistant** panel, which is hidden by default to maximise 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 four tool groups: modes, painting, drawing, and sculpting.

- ④ **Viewing area** — The viewing area contains two types of tabbed windows: the **2D View** and **3D View**. These display the layers of two-dimensional vector and bitmap artwork in your model. The **3D View** window also displays the relief layers containing your three-dimensional shapes, calculated toolpaths, and toolpath simulations. Each window has a toolbar and colour palette. For more information, see *The design windows*.
- 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, layers, triangle meshes, assemblies, and replica meshes, as well as calculate, edit, and simulate toolpaths. For more information, see *Using the Project panel*.

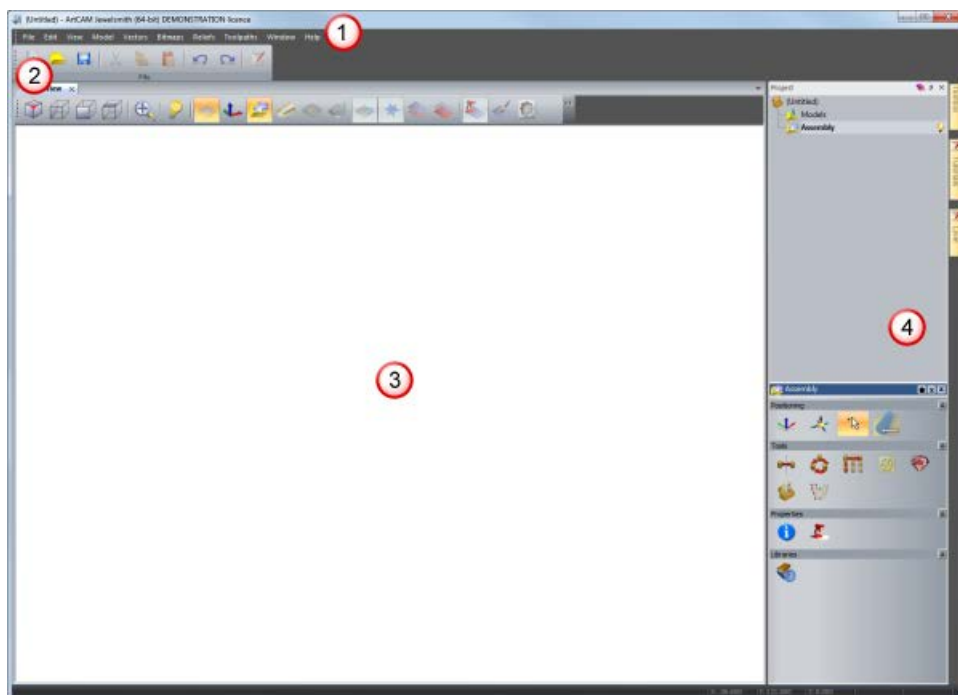
Five panels are hidden by default: **Toolpaths**, **Relief Layers**, **Bitmap Layers**, **Vector Layers** and **Assistant**. When displayed, each panel is docked and pinned. The layers panels are also tabbed.



*If you are working in ArtCAM Express or ArtCAM Insignia, the **Relief Layers** panel is not included.*

The open project layout

When you create a new project, the layout includes four key areas:



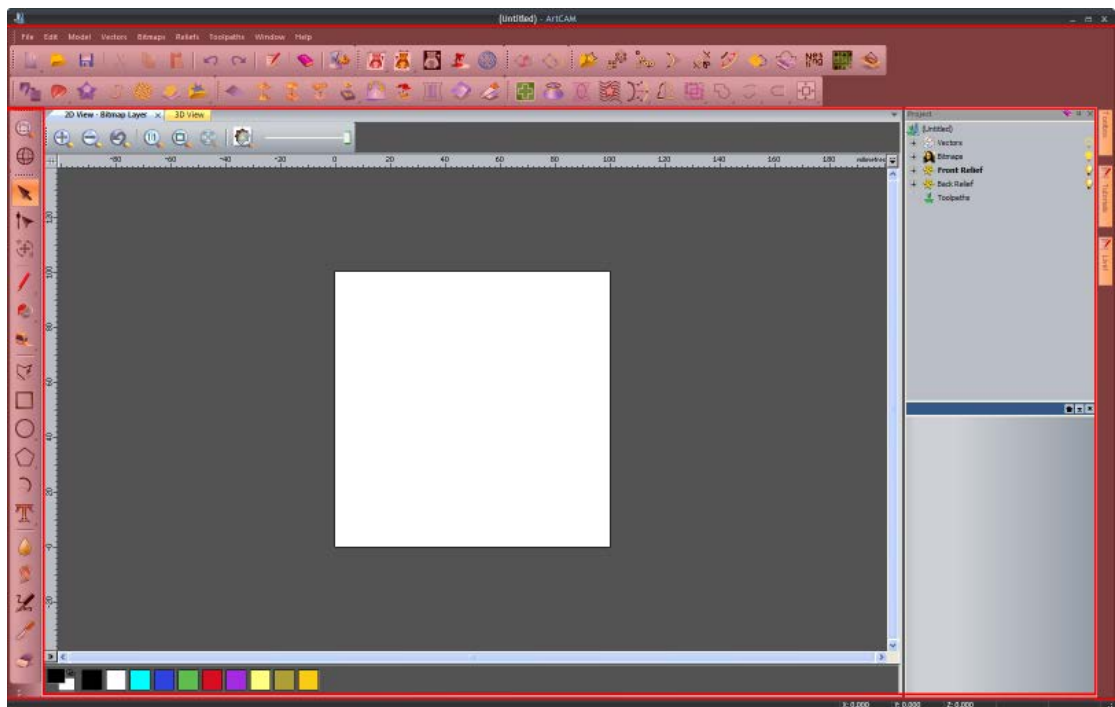
If you are working in ArtCAM Express or ArtCAM Insignia, you cannot create a project.

- ① **Menu Bar** — As described previously, although fewer sub-menus and commands are active compared to when a model is opened.
- ② **Top docking area** — The **File** toolbar is docked horizontally here.
- ③ **Viewing area** — The viewing area is filled by a tabbed **3D View** window. This displays the assemblies and replica meshes included in your project. When a model is opened as part of your project, in the **3D View** window, you can toggle between the display of your project's assemblies and replica meshes, as well as the model's relief layers, calculated toolpaths and toolpath simulations.
- ④ **Project panel** — The Project Tree displays only two items: one that enables you to import ArtCAM models, triangle models and surface models as assemblies and replica meshes, the other to create and import ArtCAM models.

Docking areas

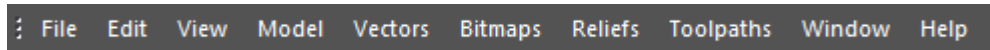
There are four docking areas, one located on each side of the viewing area.

The docking areas are highlighted in red:

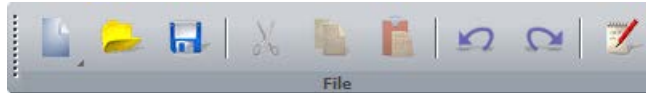


When you start ArtCAM or create a project, the top docking area contains:

- the **Menu Bar**, which is docked horizontally below the **Title Bar**.



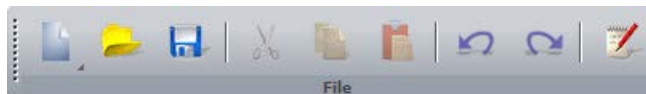
- the **File** toolbar, which is docked horizontally below the **Menu Bar**.



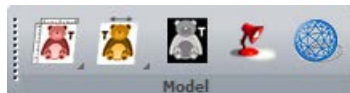
When you create a model, the top docking area contains:

- the **Menu Bar**, which is docked horizontally below the **Title Bar**.
- the **File, Model, Bitmap Tools, Vector Creation, Vector Editing, Fill Tools, View Manipulation, Relief Creation and Relief Editing** toolbars, which are docked horizontally below the **Menu Bar**.

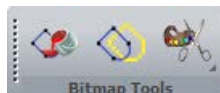
File toolbar



Model toolbar



Bitmap Tools toolbar



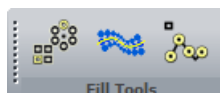
Vector Creation toolbar



Vector Editing toolbar



Fill Tools toolbar



View Manipulation toolbar



Relief Creation toolbar

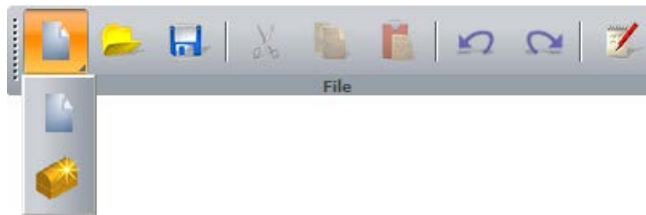


Relief Editing toolbar



If you are working in ArtCAM Insignia, several tools are not included in these toolbars.

Many toolbars include toolsets, which are identified by  in a button's bottom right corner. For example, the **File** toolbar includes the toolset shown below:



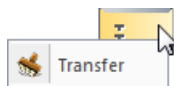
A toolset's most recently selected button is displayed in the toolbar. The other buttons are hidden.

If a complete toolbar cannot fit within a docking area:

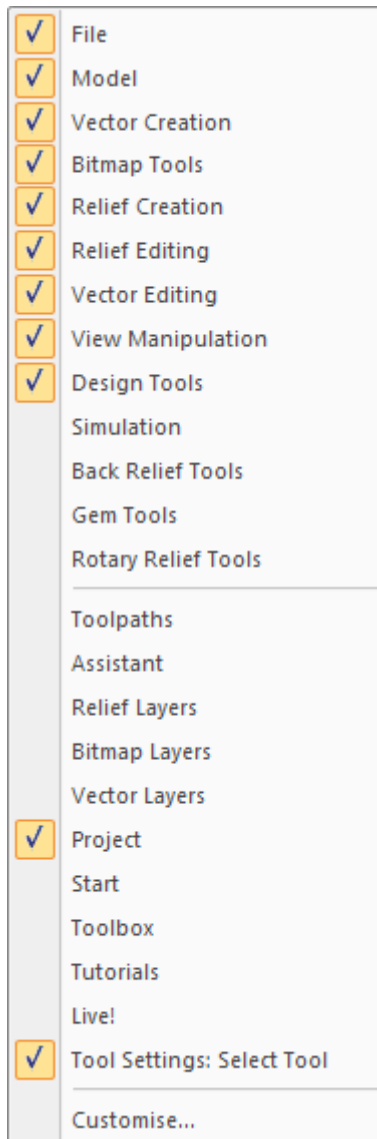
-  is displayed at the end, when the toolbar is horizontal.
-  is displayed at the bottom, when the toolbar is vertical.

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

For example, when the **Transfer** 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:



*If you are working in ArtCAM Express or ArtCAM Insignia, the **Rotary Relief Tools**, **Gem Tools**, **Back Relief Tools** and **Relief Layers** options are not included. If you are working in ArtCAM Pro, the **Rotary Relief Tools** and **Gem Tools** option are not included.*

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 or create a project, the right docking area contains:

- the **Toolbox**, **Tutorials** and **Live!** panel tabs;



*If you are working in ArtCAM Express, the **Toolbox** panel tab is replaced by the **Modules** panel tab.*

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

- the **View Manipulation** toolbar.



- the **Design Tools** toolbar.



If you are working in ArtCAM Insignia or ArtCAM Express, there are fewer tools available from the Design Tools toolbar. For more information see the relevant topics in the reference help.

When you create a model, the right docking area contains the **Toolbox**, **Tutorials** and **Live!** panel tabs, which are vertical:

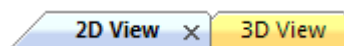


*If you are working in ArtCAM Express, the **Toolbox** panel tab is replaced by the **Modules** panel tab.*

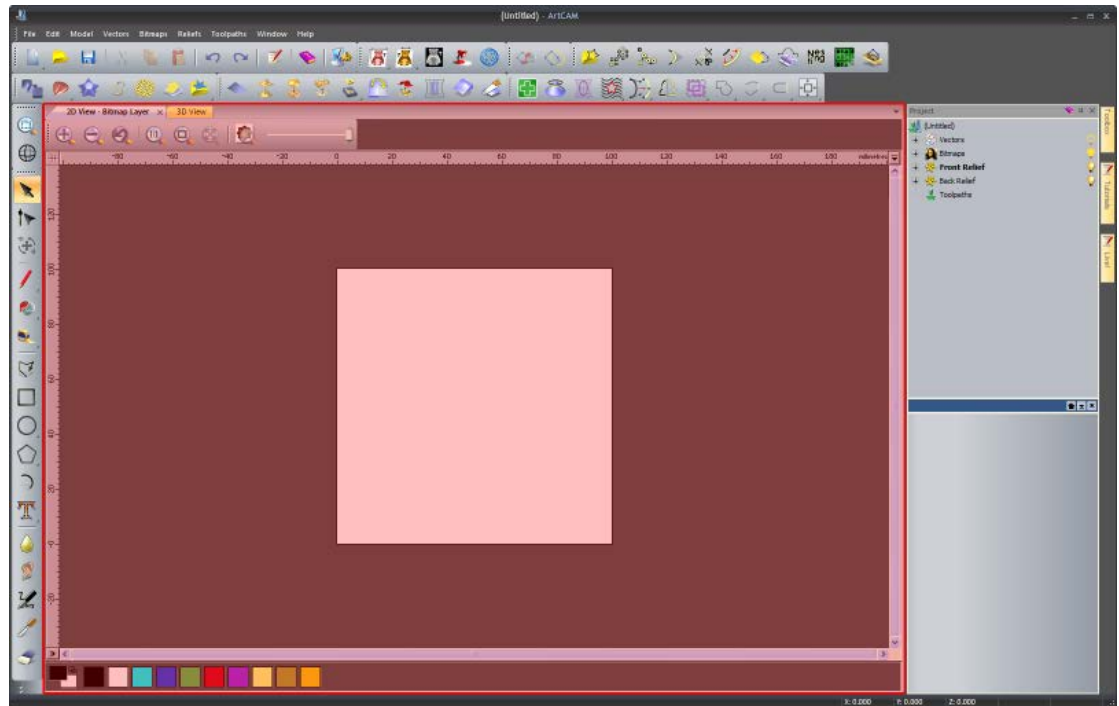
Viewing area

When you start ArtCAM, the viewing area is empty.

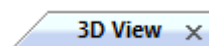
When you create a model, the viewing area contains the **2D View** and **3D View** windows, tabbed with the **2D View** window active.



The following image shows the ArtCAM layout when a new model is created. The viewing area is highlighted in red:



When you create a project, the viewing area contains the **3D View** window, tabbed and active.



Status bar

From left to right, the following information is 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 **New**



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

Create a new model

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



- the cursor's XYZ coordinates, when the cursor is over the **View** window.

X: 0.000 | Y: 0.000 | Z: 0.000

- the height and width of the bounding box, when vector artwork or toolpath previews are selected.

W: 100.000 | H: 100.000

- a resizing grip.



Extending ArtCAM Express

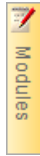
The **Modules** panel provides brief information about the modules compatible with ArtCAM Express, and enables you to purchase them. Modules offer a more versatile way of working, and increase your choice of machining methods.

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 21).
- tools to activate purchased modules (see page 30).

The available modules are:

- **Advanced 2D Machining** — This module 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 module 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 module 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 module 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 module enables you to create a toolpath that engraves within or around the boundary of vector text or a selection of vectors.
- **Raised Round** — This module enables you to create a toolpath that produces precise recessed letters and shapes using vector text or a selection of vectors.
- **Feature Machining** — This module enables you to create a toolpath that machines raised, recessed or centreline-engraved features created from vector artwork.
- **File Import** — This module 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 module 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 module enables you to create your own fonts, or modify the collection of fonts already installed on your computer.
- **Fluting** — This module enables you to create and control ramping cuts along vectors. The fluting toolpath is ideal for creating designs on wooden doors, or woven patterns around coins.
- **Bevel Carving** — This module enables you to create a toolpath that replicates a bevelled (angled-edge) look for the vector artwork that you have selected.

- **Multi-Plate Engraving** — This module enables you to create sheets of badges or name-plates, each with its own unique details, using only vector artwork to control the shape and layout, a text file (*.txt or *.csv) containing the data you want to feature on the plates, and vector text to set how and where this data is used.
- **Toolpath Panelling** — This module enables you to machine a design larger than the bed-size of your router, or larger than the sheets of material that are currently available.

Purchasing modules



ArtCAM Express only.

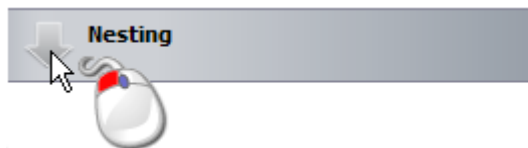
To purchase one or more modules:

- 1 Display the **Modules** panel (see page 19).

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**:



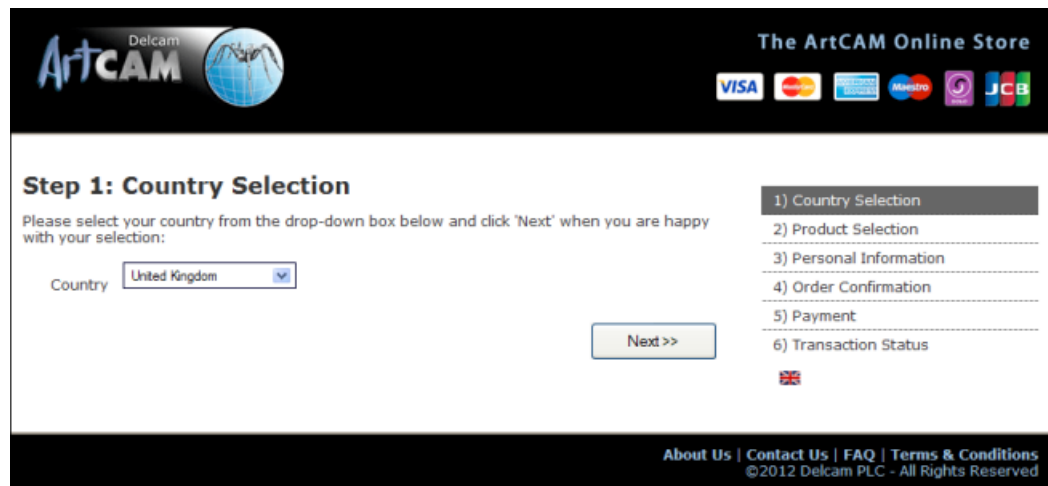
For each module that you remove from the shopping basket:

- 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.

- 5 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:



The screenshot shows the 'Step 1: Country Selection' page of 'The ArtCAM Online Store'. The header includes the Delcam ArtCAM logo and a list of payment methods: VISA, MasterCard, American Express, Maestro, and JCB. The main content area has the title 'Step 1: Country Selection' and a prompt: 'Please select your country from the drop-down box below and click 'Next' when you are happy with your selection:'. Below this is a dropdown menu labeled 'Country' with 'United Kingdom' selected. A 'Next >>' button is positioned to the right of the dropdown. On the right side, a vertical list of steps is shown: 1) Country Selection (highlighted), 2) Product Selection, 3) Personal Information, 4) Order Confirmation, 5) Payment, and 6) Transaction Status. A small UK flag is visible below the list. The footer contains links for 'About Us', 'Contact Us', 'FAQ', and 'Terms & Conditions', along with the copyright notice '©2012 Delcam PLC - All Rights Reserved'.

- a 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.
- b 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) ☒ **Select**

Use New Dongle (Purchase Additional Seats) ☐

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: £1,200.00

Empty Basket **Next >>**

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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 **X** 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:

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
Delcam / Reseller	delcam@delcam.co.uk
Create a new contact	

Billing Address

Company

Address Line 1*

City*

County / Province*

Postcode / Zipcode*

Country

Telephone Number*

Vat Reg Number (EU Only)

<< Back Next >>

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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:

The screenshot shows the 'Step 4: Order Confirmation' page of 'The ArtCAM Online Store'. The page header includes the ArtCAM logo and various payment icons (VISA, MasterCard, American Express, Maestro, JCB). A progress bar on the right lists six steps: 1) Country Selection, 2) Product Selection, 3) Personal Information, 4) Order Confirmation (highlighted), 5) Payment, and 6) Transaction Status. Below the progress bar is a small UK flag. The main content area is divided into two sections: 'Billing Address' and 'Order Contents'. The 'Billing Address' section contains a list of address fields with placeholder text. The 'Order Contents' section features a table with two columns: 'Item' and 'Cost'. The table lists 'Nesting' as the only item. Below the table, there are summary rows for 'Sub Total:', 'VAT:', and 'Total:'. At the bottom of the main content area, there is a text prompt: 'Click 'Confirm Order' to finish your order and proceed to the payment stage.' Below this prompt are two buttons: '<< Back' and 'Confirm Order'. The footer of the page contains links for 'About Us', 'Contact Us', 'FAQ', and 'Terms & Conditions', along with the copyright notice '©2012 Delcam PLC - All Rights Reserved'.

Step 4: Order Confirmation

Billing Address

Mr John J. Smith
123 Main St
London, UK
EC1A 1AA
020 1234 5678
john.smith@delcam.co.uk

Order Contents

Item	Cost
Nesting	£1200.00
Sub Total:	£1200.00
VAT:	£240.00
Total:	£1440.00

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 screenshot shows the 'Step 5: Payment' page of the ArtCAM Online Store. The header includes the ArtCAM logo and payment icons for VISA, MasterCard, American Express, Maestro, and JCB. The main content area has a heading 'Step 5: Payment' and a subheading 'Your order is ready for processing. Click 'Make Payment' to be transferred to our payment provider and complete your transaction.' Below this, it says 'Order ID = 1234' and '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](#).' A 'Make Payment' button is visible. On the right, a list of steps is shown: 1) Country Selection, 2) Product Selection, 3) Personal Information, 4) Order Confirmation, 5) Payment (highlighted), and 6) Transaction Status. The footer contains links for 'About Us', 'Contact Us', 'FAQ', and 'Terms & Conditions', along with the copyright notice '©2012 Delcam PLC - All Rights Reserved'.

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

The screenshot shows the Delcam ePDQ payment provider page. The header includes the Delcam logo and the text 'Secure, reliable internet payments from Barclaycard Business ePDQ'. Below this, there are logos for VISA, MasterCard, Maestro, American Express, and VISA ELECTRON, along with 'Verified by VISA' and 'MasterCard SecureCode'. The main content area has a heading 'Payment Information - Total Payment Value: £ 1234.56'. Below this, there are two sections: '1 - Card Details' and '2 - Cardholder Information'. The '1 - Card Details' section includes fields for Card Type (a dropdown menu), Card Number, Expiry Date (mm/yy), Valid From (mm/yy), Issue Number, and Card Security Code. The '2 - Cardholder Information' section includes fields for Full Name, Address Line 1, Address Line 2, Address Line 3, Town / City, County, Post / Zip Code, State (* if US), Country, Telephone Number, and Email Address. At the bottom, there is a legend indicating that '*' indicates a mandatory field and '†' indicates a mandatory field for Maestro cards issued in the UK and Solo cards. There are also 'Clear Form' and 'Submit Payment' buttons.

- 

Delcam



Delcam



ePDQ

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









Verified by VISA

MasterCard SecureCode

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

Transaction Details

Payment Status: **Success**

Date / Time: 12/12/2011 15:00:00

Merchant: DELCAM LTD

Approval Code: 123456

Payment ID: 123456

Amount: £10.00

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

Expiry Date: 12/2011

Cardholder Details

Cardholder Details: Mr John Smith

Address: 123 Main St

City: London

Postcode: E1 1AA

Country: United Kingdom

Phone: 01234 567890

Mobile: 07123 456789

Email: john.smith@delcam.com

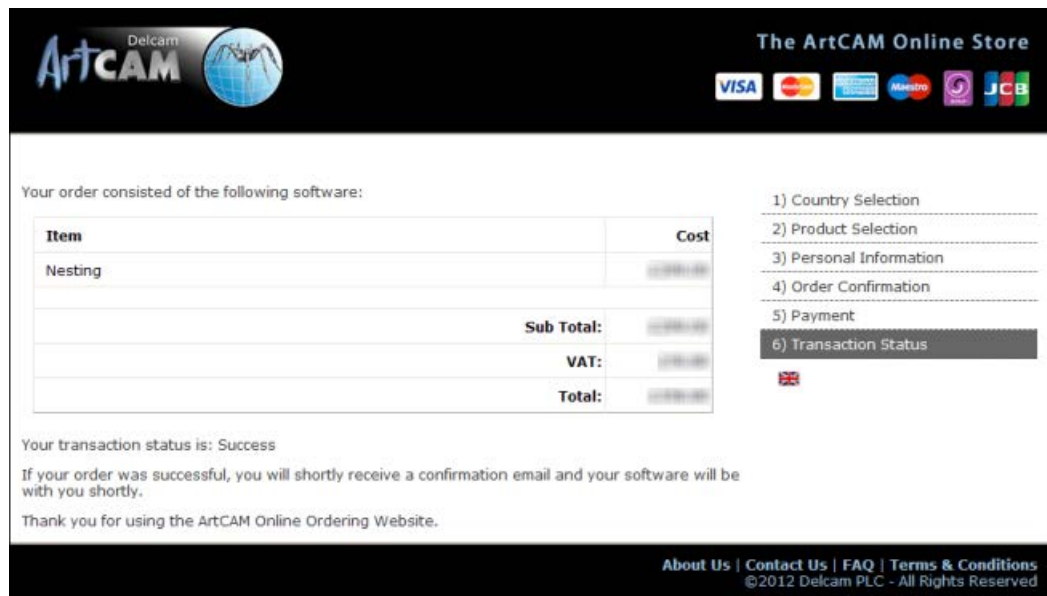
* Please print for your records (landscape format)

[Print](#)

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

[Complete Payment](#)

- **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 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

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



ArtCAM Express only.

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

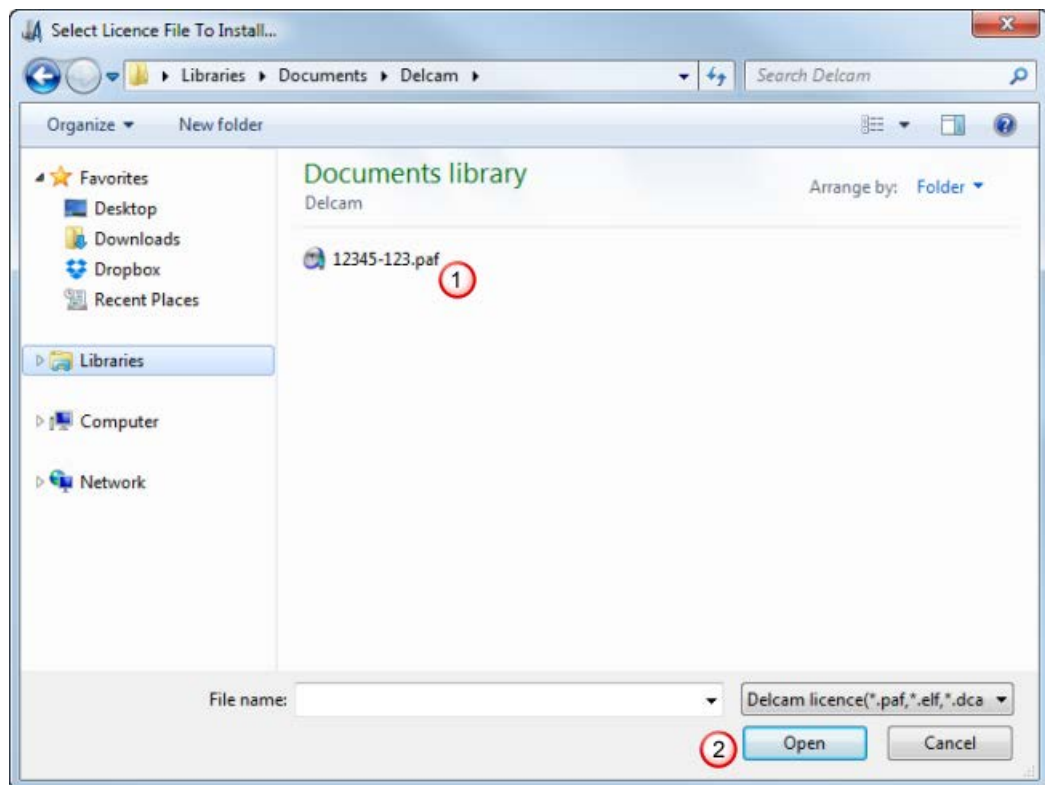
- sent an email confirming your purchase.
- issued a new PAF licence file (*.paf) by email.

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 19).
- 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**.
 - b Click **Start > All Programs > ArtCAM 2015 > ArtCAM 2015**.

The Start panel

When you open ArtCAM, and when no model or project is open, the **Start** panel is docked and pinned on the left. The panel is divided into four areas: **Projects**, **Models**, **Recent Files** and **Other Features**.



*If you are working in ArtCAM Express or ArtCAM Insignia, the **Projects** area is not included.*

The **Projects** area enables you to:

- create a new ArtCAM Project.
- open an ArtCAM Project.

The **Models** area enables you to:

- create a new ArtCAM model of a specific size.
- open a compatible file as an ArtCAM model.

The **Recent Files** area enables you to open one of the last four ArtCAM Model files (*.art) or ArtCAM Project files (*.3dp) you have been working on.



If you are working in ArtCAM Express or ArtCAM Insignia, the last four ArtCAM Model files (.art) are listed.*

The **Other Features** area enables you to:

- create new fonts or modify them.
- create a relief in the shape of a face from a photographic image.



If you are working in ArtCAM Express or ArtCAM Insignia, this option is not included.

- open MillWizard.
- find out about the latest features and enhancements (see page 2).

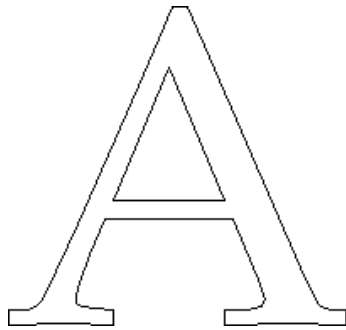
If you are working in ArtCAM Express, there is an **Upgrades** area which enables you to download new modules, or upgrade to ArtCAM Insignia or ArtCAM Pro.

When you create or open a project or model, the **Start** panel is closed. The space previously occupied by the **Start** panel is then used by the viewing area. To display the **Start** panel again, right-click anywhere on the top toolbar area and select **Start**.

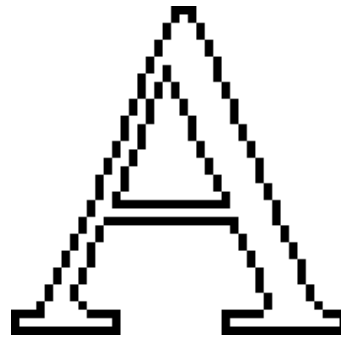
Comparing bitmaps, vectors and reliefs

Vectors and bitmaps are two different methods of reproducing particular types of images. ArtCAM uses both bitmap images and vectors to create three-dimensional shapes. In ArtCAM, a vector can be created from a bitmap image, and vice versa.

Vector Data

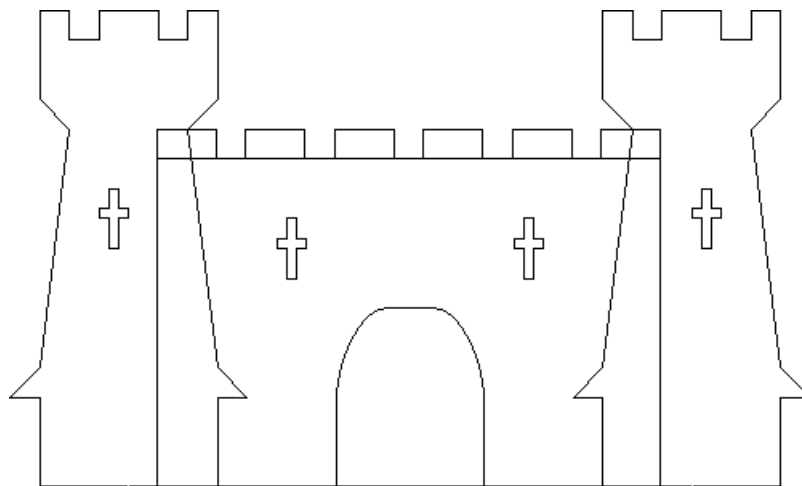


Bitmap Data



The three-dimensional shapes created from the bitmap images and vectors in ArtCAM make up a relief layer. These relief layers make up the composite relief representing the piece that you want to machine.

Vectors

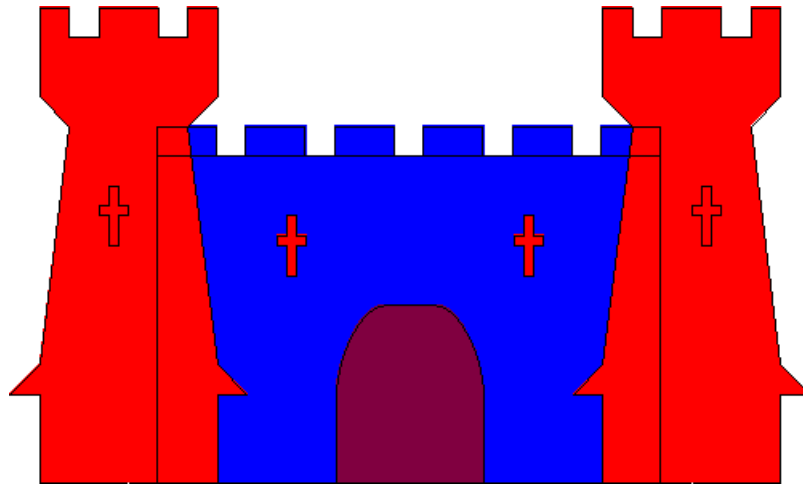


Vector data is defined mathematically. Objects are geometrical, being made up of a number of points connected by lines or curves. Vectors are extremely flexible and can be manipulated with both ease and accuracy.

Vector data is ideal for producing smooth features. A vector not only has greater definition than the bitmap, the geometry of the vector can also be used to drive an assigned machining tool directly, which, in turn, can produce a better finish.

Vector artwork is drawn on vector layers in ArtCAM and can be used to create three-dimensional shapes on relief layers or toolpaths to machine a two-dimensional piece.

Bitmaps

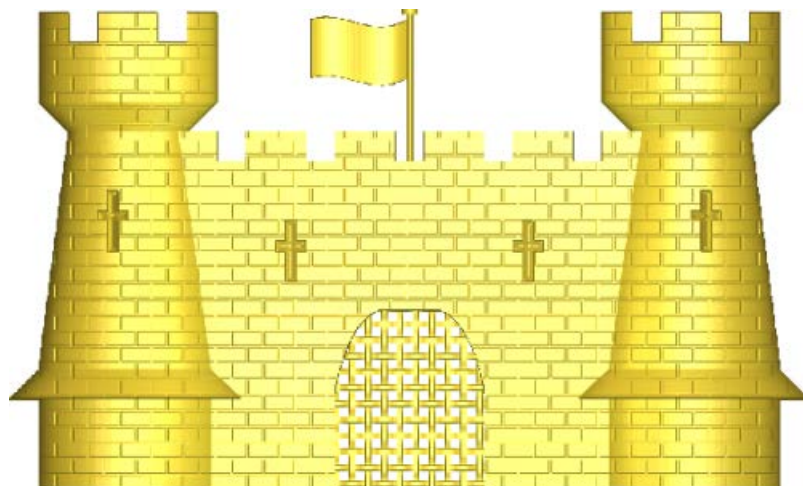


Bitmap data is made up of a set of values specifying the colour of individual pixels (picture elements) that make up an image. Bitmap data is characterised by resolution and bit depth.

Unlike vector data, bitmap data is large. For small compositions the increase in file size may not matter greatly, but for larger compositions the difference in file size seriously impacts machining times.

ArtCAM allows three-dimensional shapes to be created from bitmap colours on bitmap layers. It can also read image files generated by other drawing and desktop publishing packages or those scanned from paper based artwork.

Reliefs



If you are working in ArtCAM Express or ArtCAM Insignia, although there is a relief, there are no relief layers.

A relief is essentially one or more three-dimensional shapes created in ArtCAM. There are two different concepts to consider when working with reliefs: the *relief layer* and the *composite relief*.

The content of a *relief layer* comprises one or more three-dimensional shapes. The relief layers on which these different shapes are created make up the *composite relief*. The way each of the relief layers combine to form the composite relief depends on the combine mode assigned to each of them, and whether or not they are visible.

The *composite relief* can be built from one of two layer stacks in the model; one representing the front surface of your design, the other representing the back. Although you can reassign a relief layer from one layer stack to the other at any time, you cannot view the composite relief resulting from both of these layer stacks concurrently.

A compromise must be made between the quality of a model, including its associated relief layers, and the speed of the processor in your computer. For most jobs, a model of 1,000,000 points is a reasonable value. Since the content of a relief layer is made up of a number of points, even the quality and smoothness of the three-dimensional shapes created from the artwork drawn across the vector layers depends upon the resolution of the model, although this is to a lesser extent than with those shapes created from colours on bitmap layers.

Tutorial - Saw Mill sign

This tutorial demonstrates how to create a *Saw Mill* sign from vector artwork. You will use ArtCAM'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:

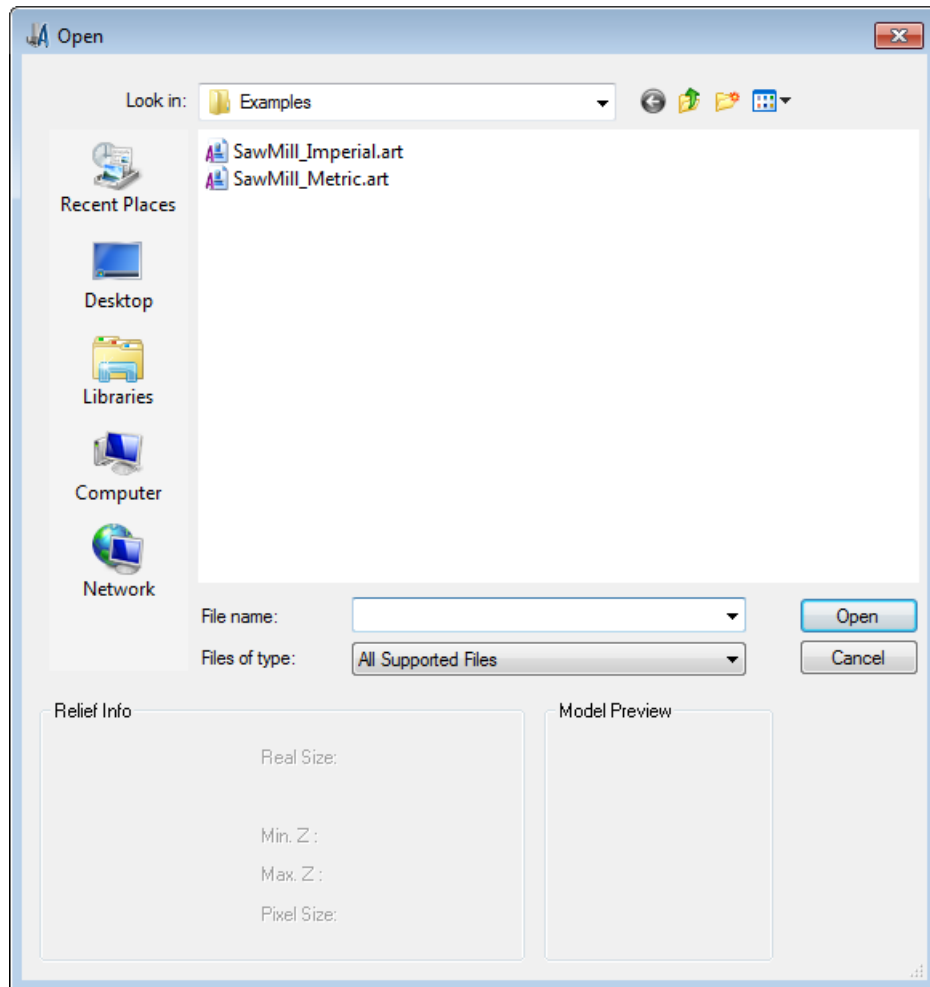
- Preparing the model (see page 37).
- Creating the offset vectors (see page 38).
- Grouping the offset vectors (see page 40).
- Creating additional vector text (see page 41).
- Repositioning the vector text (see page 42).
- Clearing the area around the text (see page 45).
- Carving the text (see page 48).
- Cutting out the sign (see page 49).
- Saving the toolpaths (see page 55).

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

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** . The **Open** dialog is displayed.



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



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

The **2D View** window is displayed 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.

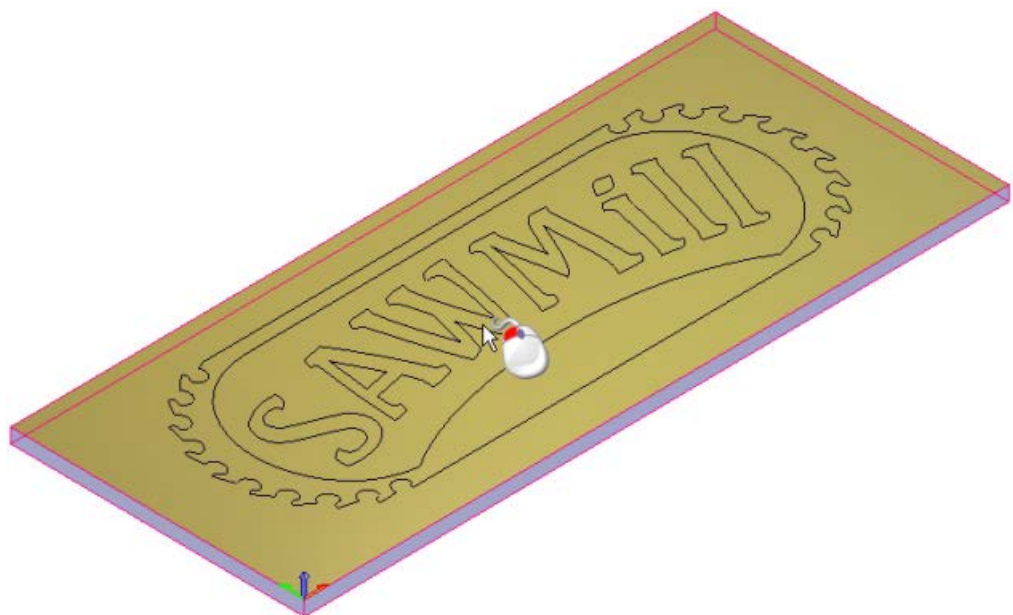
Creating the offset vectors

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.

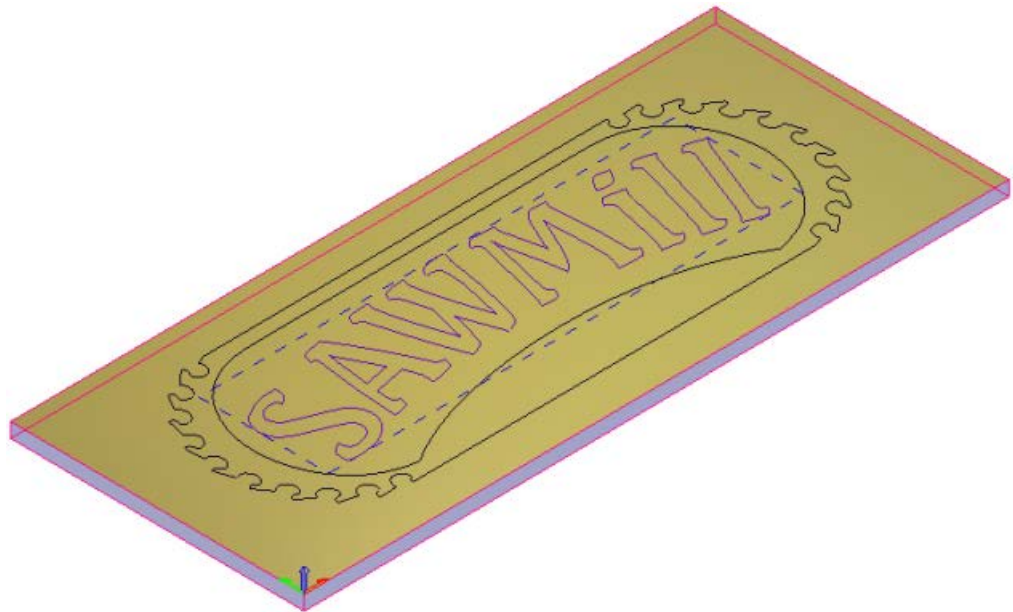
- 1 Press **F3** to display the **3D View** window.

- 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 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 **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

The same toolpath settings will be applied to the offset vectors, so 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 Press and hold down the **Shift** key, and select the offset vectors, one by one, that surround the characters in the *Saw Mill* vector text.



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

- 3 Press **Ctrl+G** 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 to align the vector text to the left with a ragged right edge.
- 5 Click the **Font** list, then select **A 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.

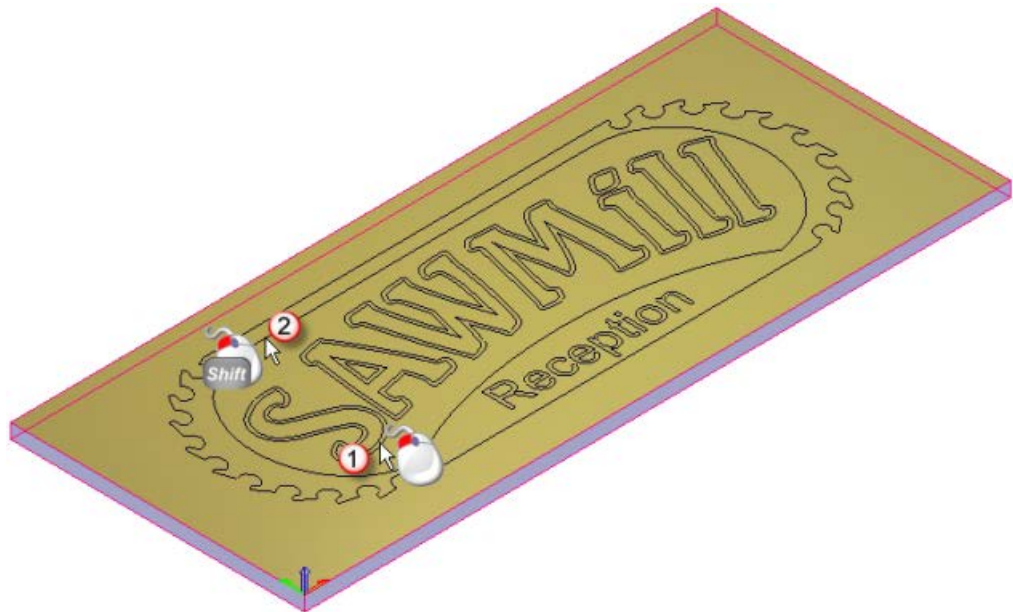
Machining the Saw Mill sign

This section demonstrates 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.

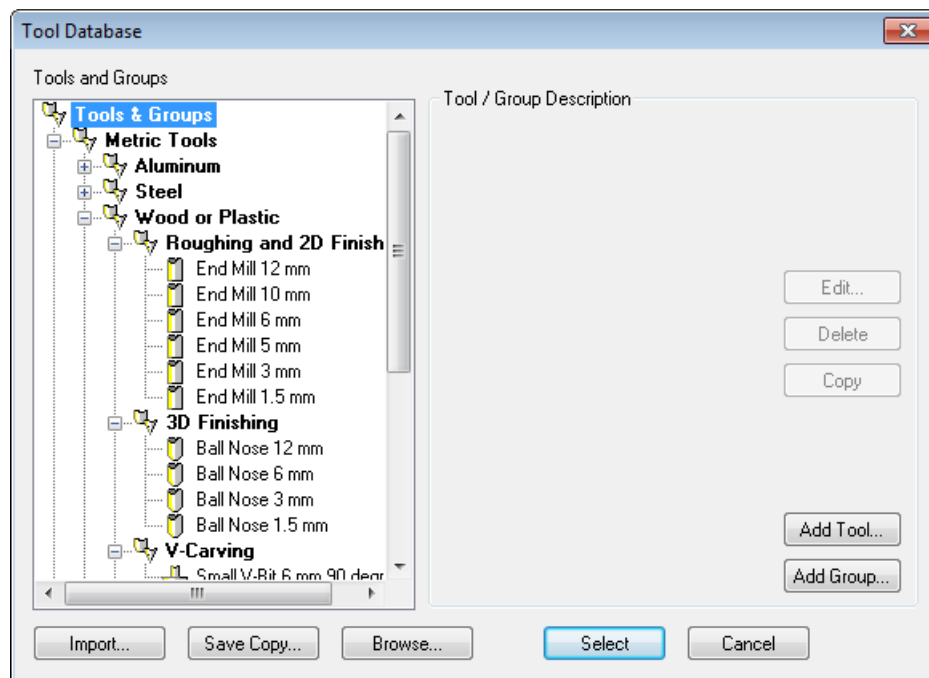
- 4 In the **Project** panel, click the  **Toolpaths** item in the Project Tree to display the **Toolpaths** panel below the splitter bar.

- 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.*

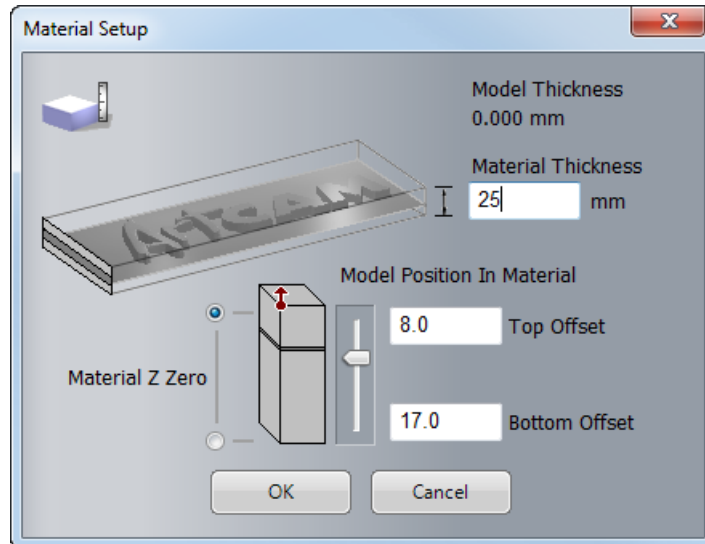


*For illustration, the tool's **Stepover** has been increased to 8 mm (0.25 inches).*

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:



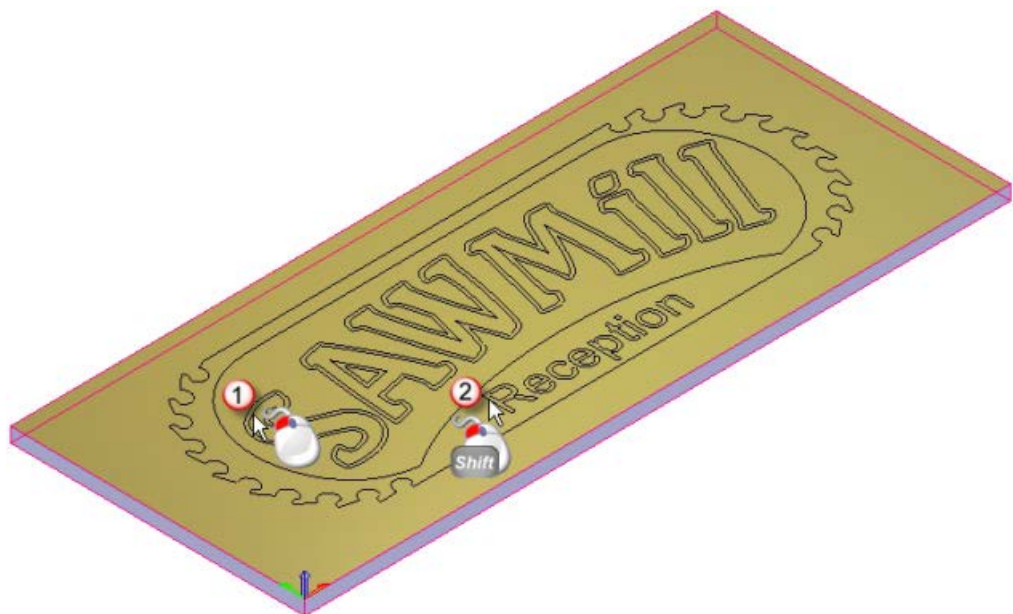
- 15 On the **2D Area Clearance** panel's header, click  to close the panel.

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 Profile list, select **Outside**.
- 5 Enter:
 - a **Allowance** — **0**.
 - b **Start Depth** — **0**.
 - c **Finish Depth** — **25** mm (**1** inch).
 - d **Tolerance** — **0.025** mm (**0.001** inches).
- 6 In the **Profiling Tool** area, click the control bar to display the **Tool Database**.
 - a 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.
 - b 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.

- 7 Set the **Cutting Direction** to **Climb**.
- 8 Select **Add Lead In Moves**. Its settings are displayed.

- 9 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.
- 10 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.
- 11 In the **Radius (R)** field, enter a value of **15**. This specifies the arc lead-in move's radius.
- 12 Deselect **Add Bridges**.
- 13 Deselect **Add Ramping Moves**.
- 14 Click **Calculate Now** to calculate the toolpath. The calculated toolpath is named *Profile* by default, and is displayed in the **2D View** window:



- 15 On the **Profiling** panel's header, click  to close the panel.
- 16 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.

- 17 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:



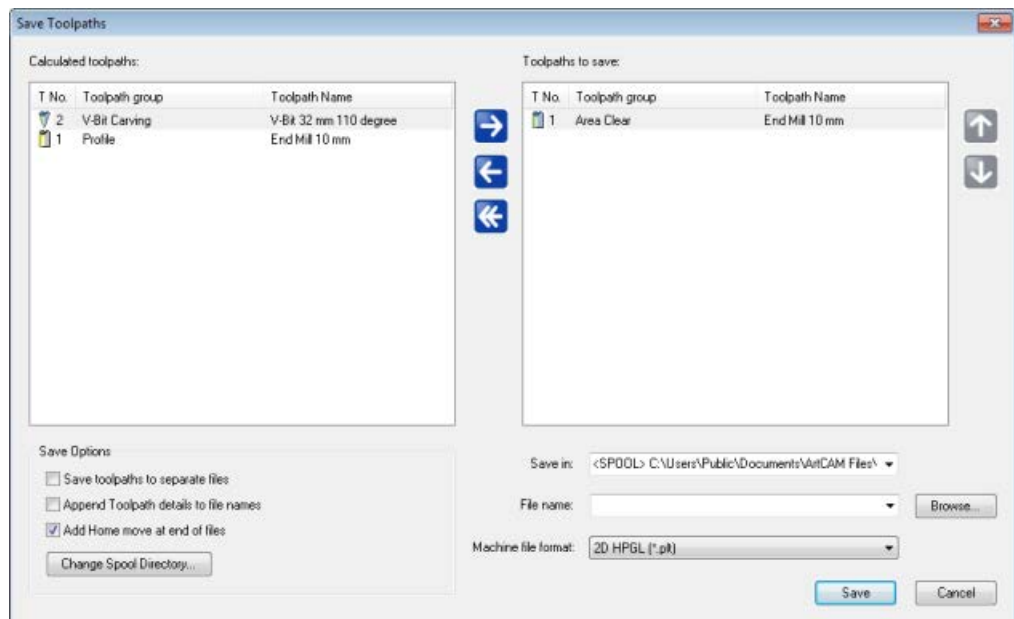
- 8 Press the **Esc** key to close the **Tool Settings: Delete Waste Material** panel and re-select the **Select** tool.

Saving the toolpaths

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

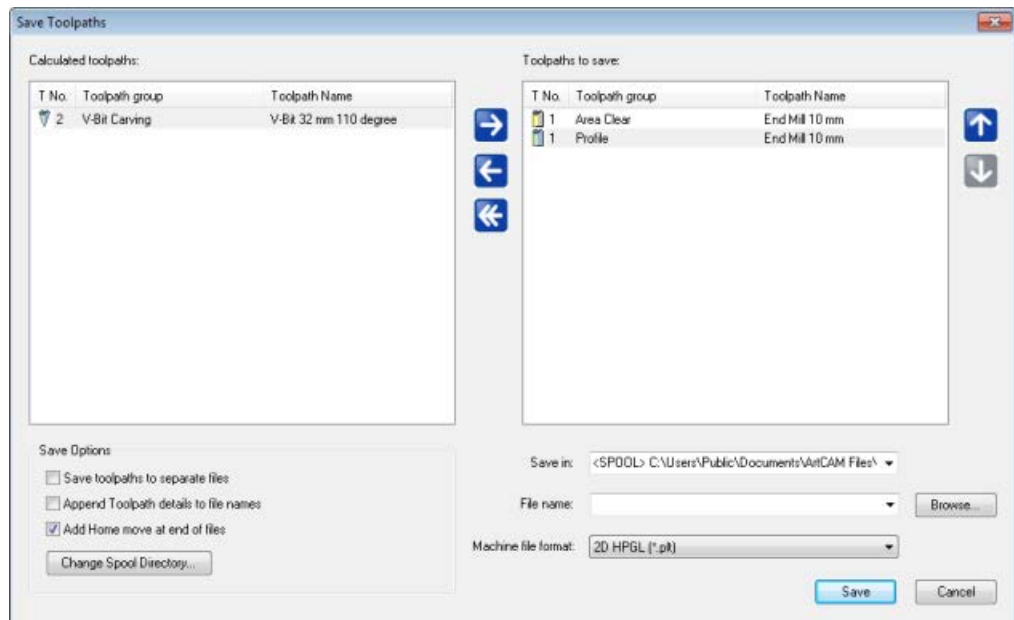
You will save the toolpaths in separate files, grouping together those that use the same tool. Both the *Area Clear* and *Profile* toolpaths share the same tool number because they both use the *End Mill 10 mm (End Mill 3/8 Inch)* tool.

- 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.



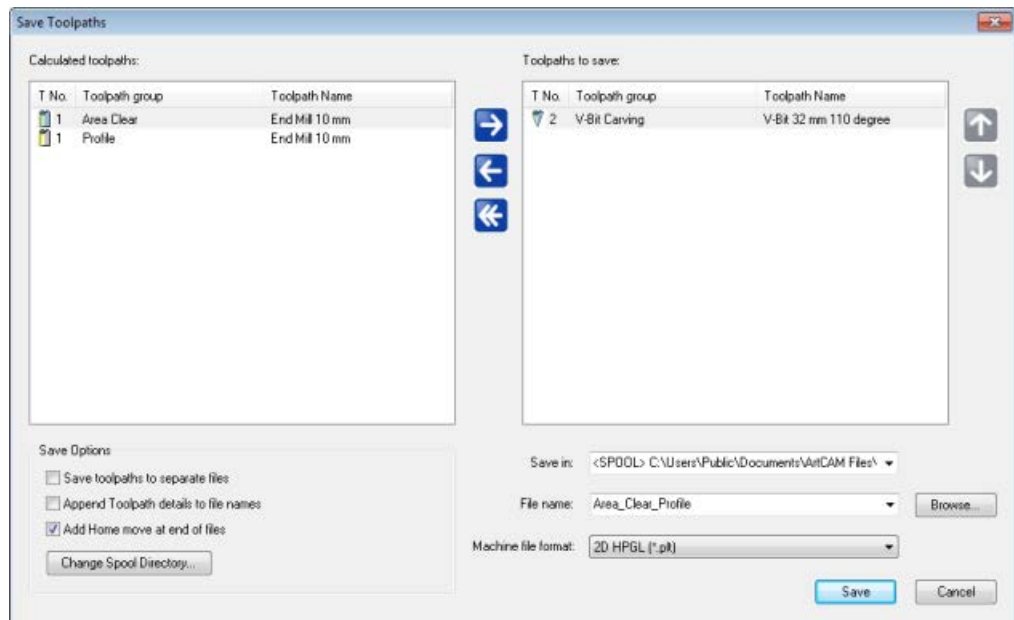
- 3 In the **Calculated toolpaths** window, select the *Profile - End Mill 10 mm (End Mill 3/8 Inch)* toolpath. Its name is highlighted.

- 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's **Relief Clipart Library**, and then create the 3D toolpaths needed to machine the lizard relief.

The stages covered by this tutorial are:

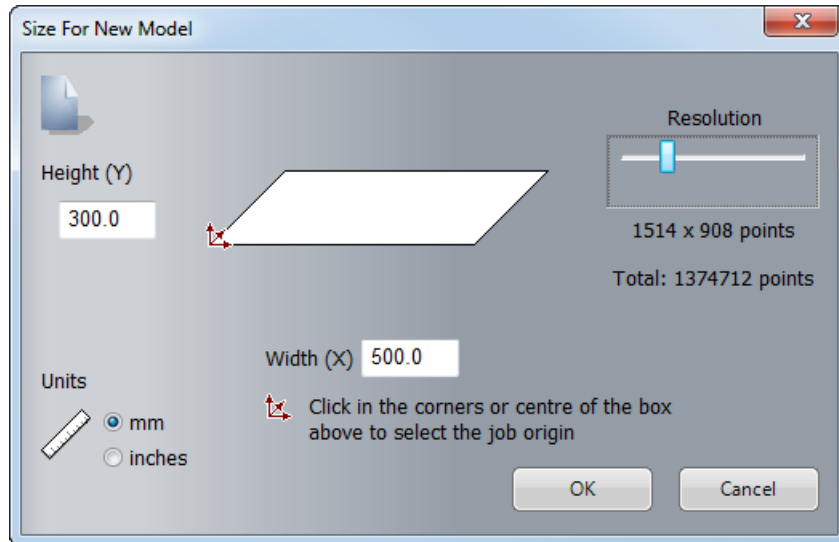
- Preparing the model (see page 59).
- Importing the relief clipart (see page 60).
- Calculating the toolpaths (see page 64).
- Simulating the toolpaths (see page 69).
- Saving the toolpaths (see page 71).

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

Preparing the model

Begin by creating a new ArtCAM model.

- 1 In the **Start** panel, click  **New Model**. The **Size For New Model** dialog is displayed.



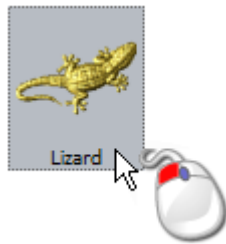
- 2 Fill in the dialog as follows:
 - a **Height (Y)** — **300**.
 - b **Width (X)** — **500**.
 - c **Units** — **mm**.
 - d **Resolution** — Around 1500 x 900 points.
 - e Select the bottom left-hand corner as the job origin.
- 3 Click **OK** to close the dialog and create a model according to these dimensions.

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

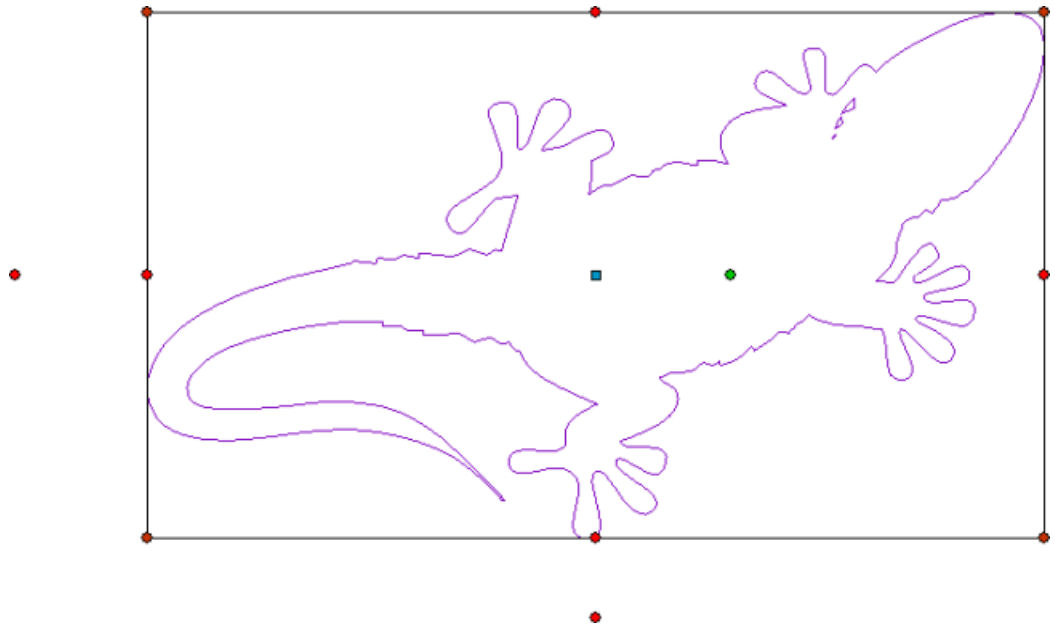
Importing the relief clipart

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:

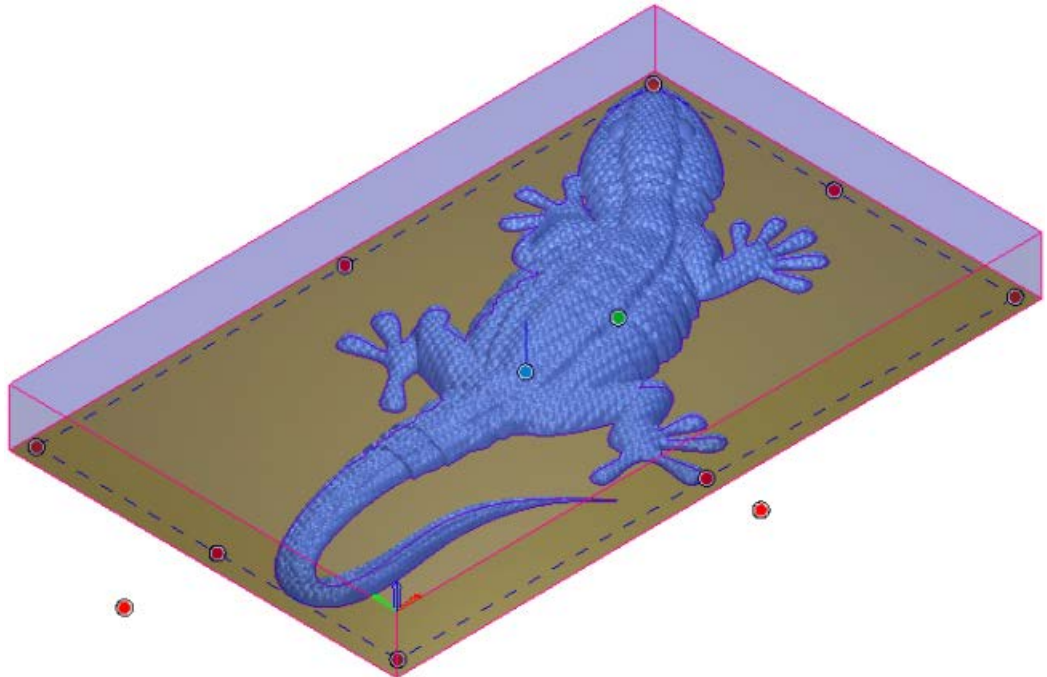
- the blue transform origin within the outline;
- the green rotation handle within the outline, which you can use to rotate the relief clipart;
- red resizing handles on each edge of the bounding box; and
- two red shearing handles outside the left and bottom edges of the bounding box.

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:

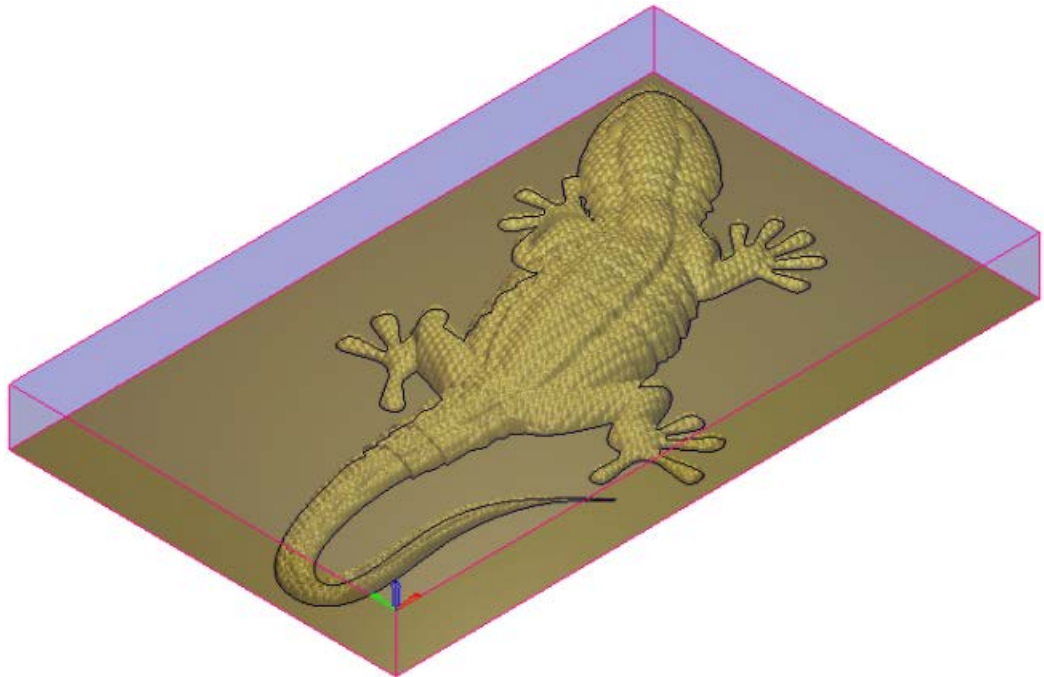


The lizard review relief's outline is purple and surrounded by a bounding box; indicating it is grouped and selected. You can also see:

- 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.

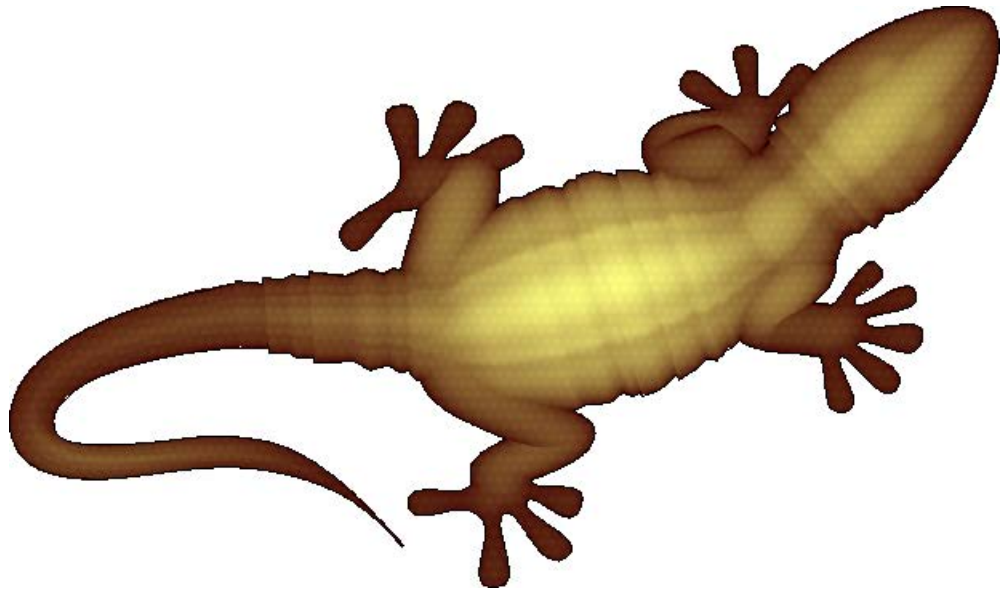
6 Press **F3** to display the **3D View** window.

- 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

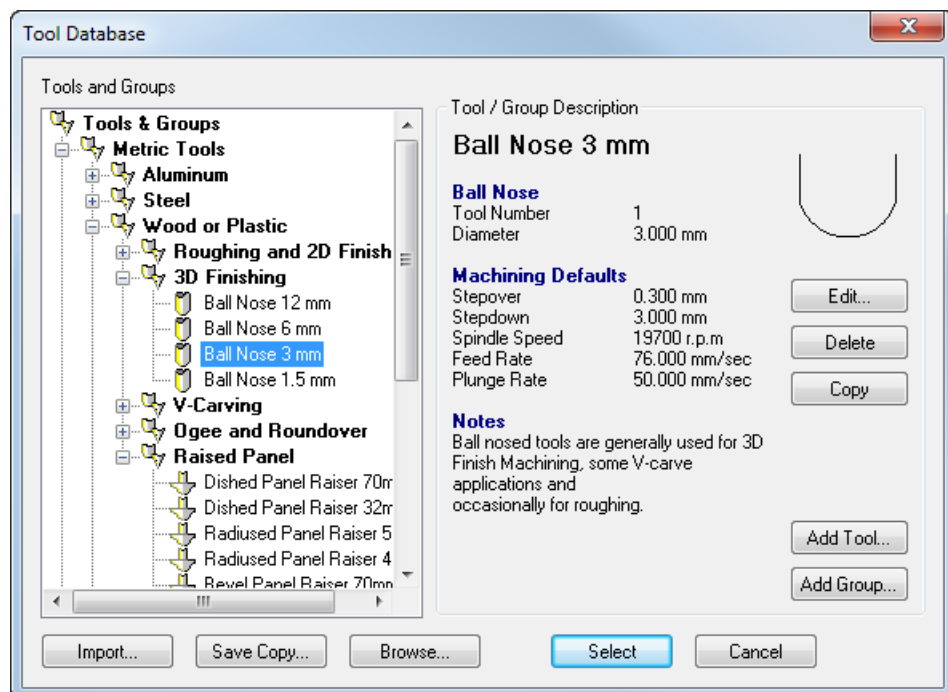
You are now ready to create and calculate two toolpaths. The first is used to machine the whole of the relief, and the second to machine only the area of the relief within the lizard relief clipart's vector boundary.

- 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.*

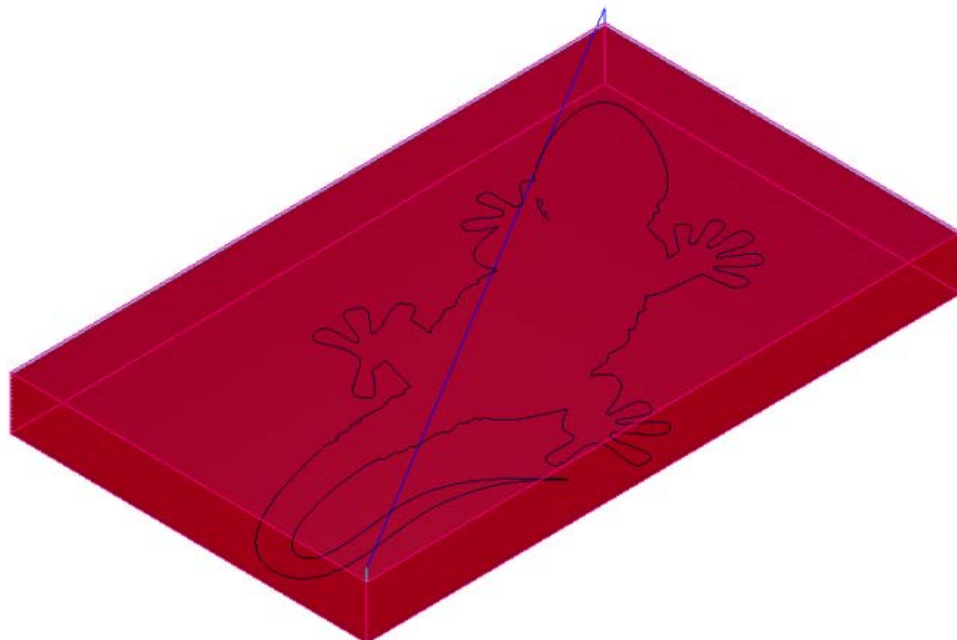
The number of passes made between the Z height of the first and last pass is decided by the **Stepdown** associated with your selected tool.



*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, enter **Machine Relief**.
- p** Click **Calculate Now** to calculate the toolpath.

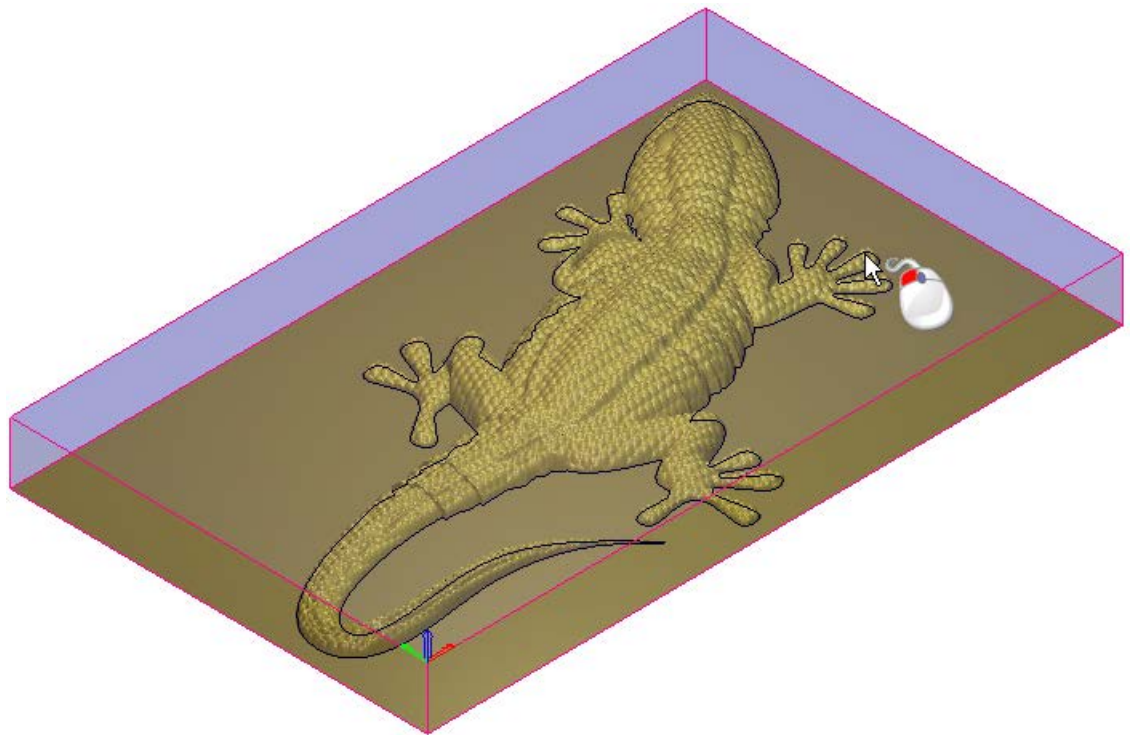
In the **3D View** window, the calculated *Machine Relief* toolpath is shown as follows:



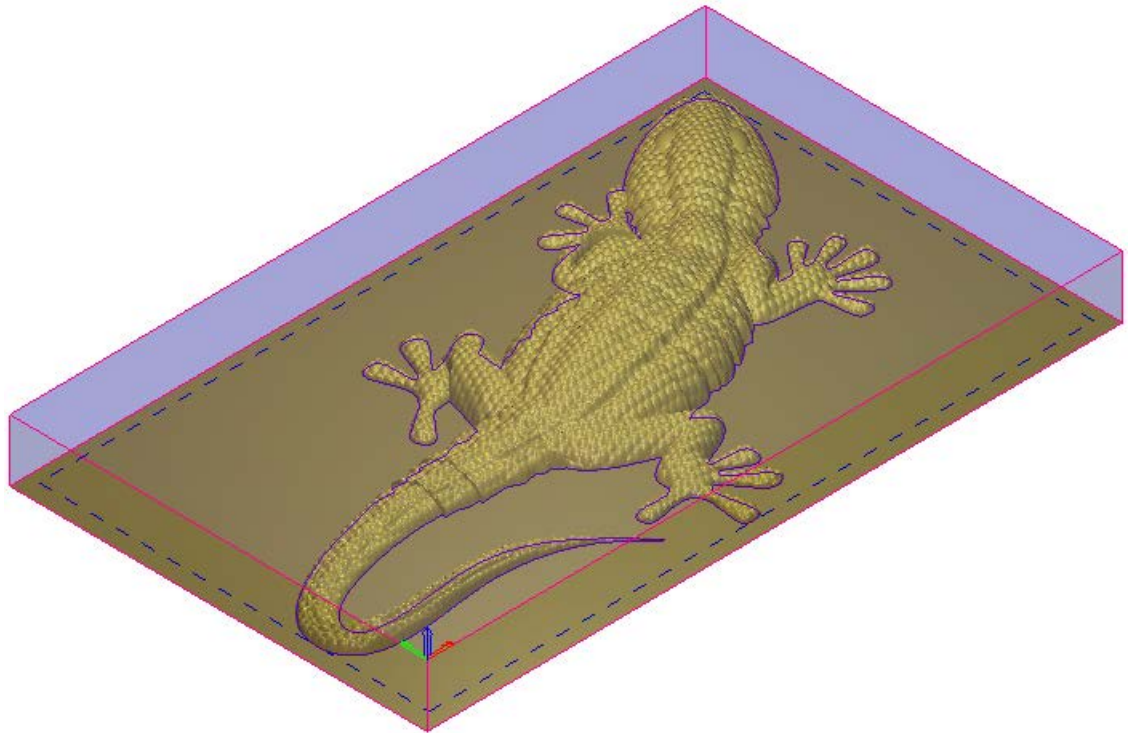


You can use the **Zoom** button in the **3D View** toolbar to view the machining passes in more detail. After clicking the button, position the magnifying cursor over the area of the toolpath on which you want to focus, click and drag to create a bounding box surrounding the area of the toolpath, and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

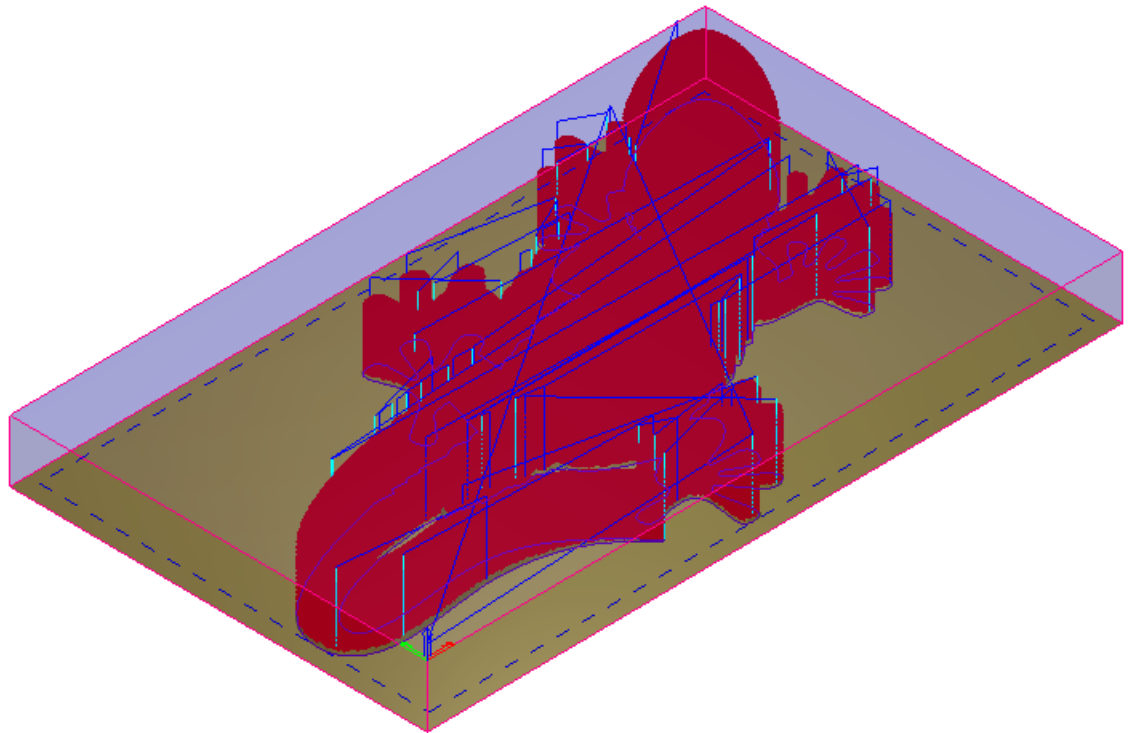


*This value is equal to the **Max Z** height of the material block less the **Stepdown** associated with your selected tool.*

- 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

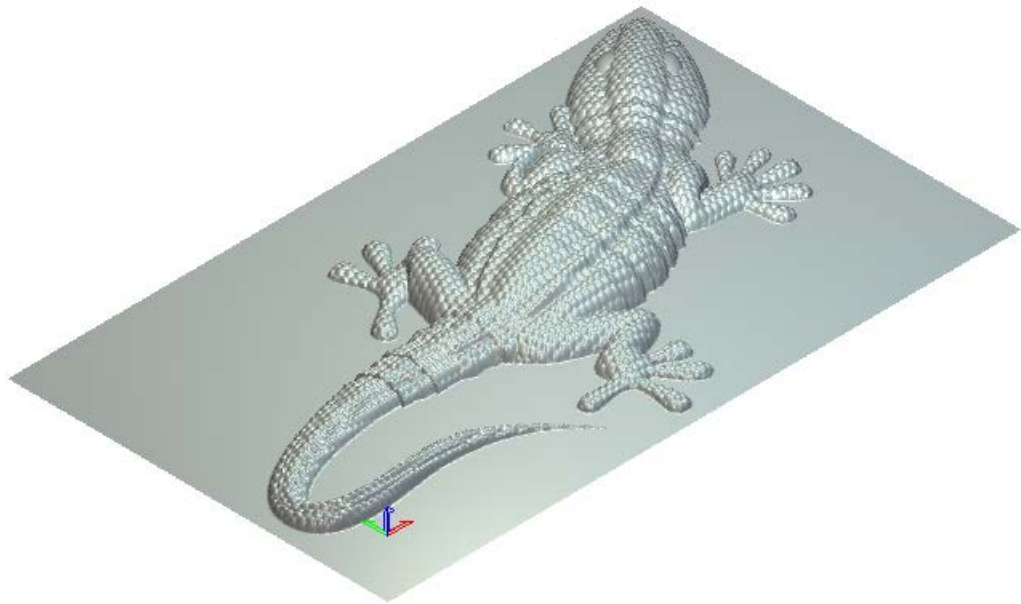
You are now ready to simulate both of the calculated toolpaths, and then render the resulting toolpath simulation using a shading set.

- 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**



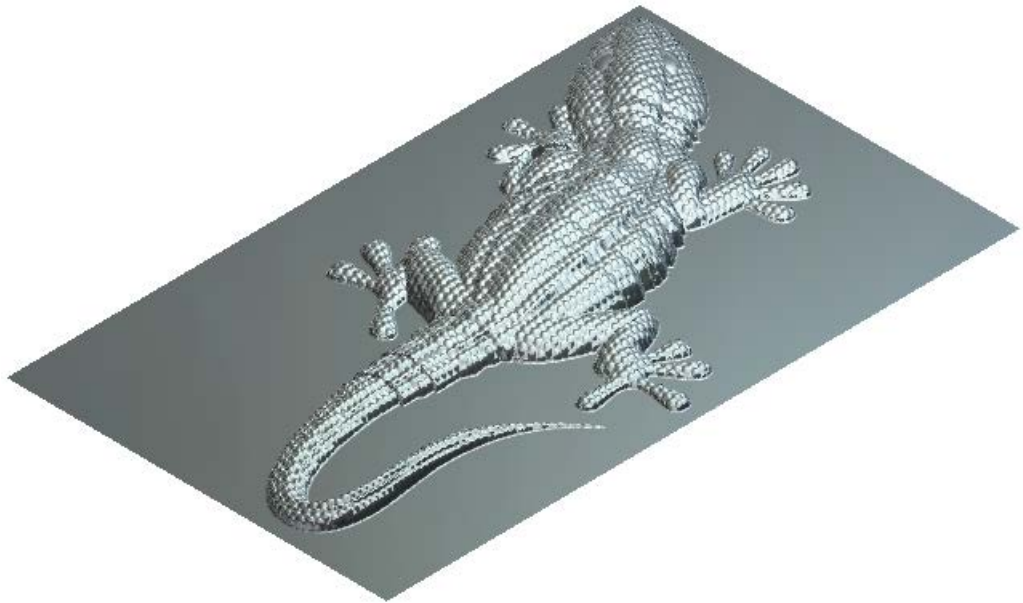
Toolpaths

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:

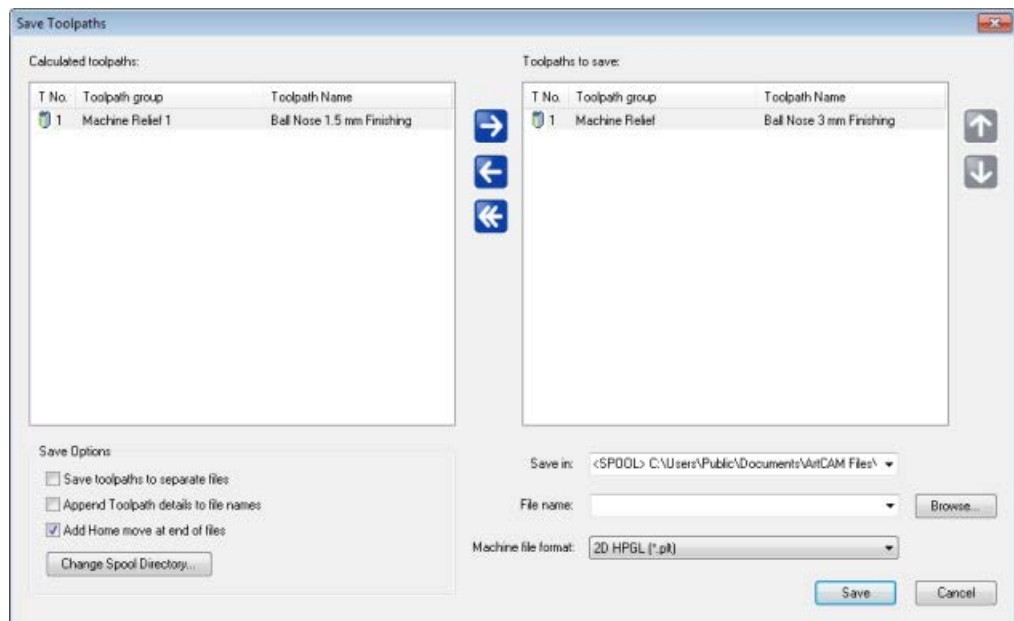


Saving the toolpaths

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.

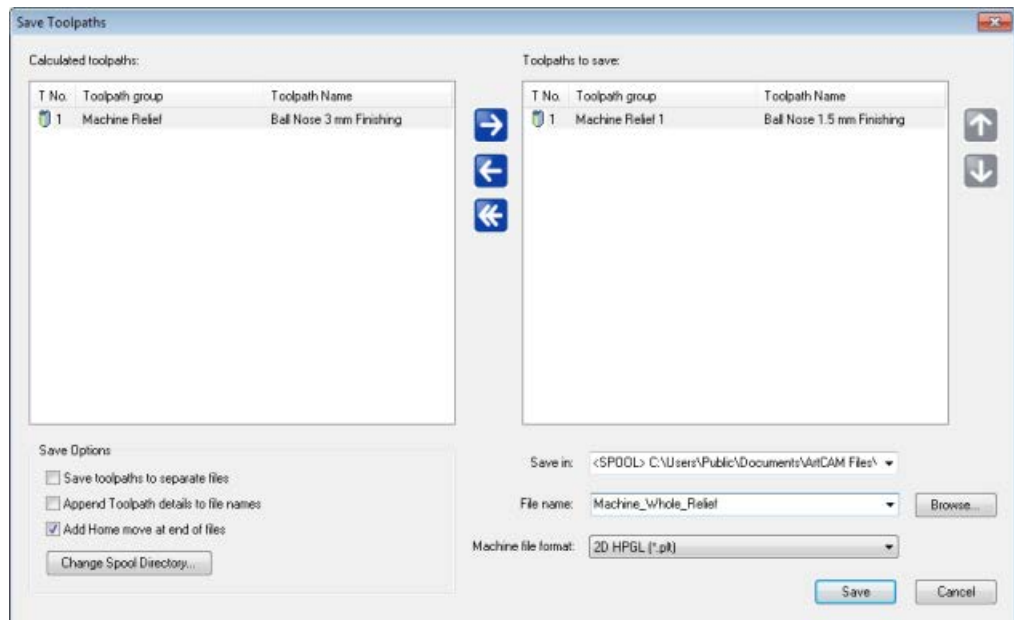
- 1 In the **Project** panel, select the  *Machine Relief* toolpath in the Project Tree to display its panel below the splitter bar.

- 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.

ArtCAM Keyboard shortcuts

This section describes the various shortcuts which are available to help you work as efficiently as possible. Some are available with no tool selected, whereas others are only active when you are working with a specific tool. You can also customise the shortcuts or assign your own shortcuts to actions if you prefer.

- General shortcuts (see page 74)
- Vectors (see page 77)
- Bitmaps (see page 78)
- Reliefs (see page 79)
- Tool specific shortcuts (see page 80)
- Using the mouse (see page 85)

General shortcuts

These shortcuts can be used with no specific tool selected.

Models

The following shortcuts can be used when working with models:

Function	Shortcut
Open model.	Ctrl+O
Create new model.	Ctrl+N
Save model.	Ctrl+S
Print model.	Ctrl+P
Toggle Notes visibility.	Ctrl+N

View control

The following shortcuts can be used to adjust the ArtCAM layout and manipulate the view:

Function	Shortcut
Display the Reference Help.	F1
Display 2D View window.	F2
Display 3D View window.	F3
Toggle Project panel visibility.	F4
Toggle Tool Settings panel visibility.	F6
Preview currently active relief layer in 2D View .	F10
 <i>If you are working in ArtCAM Insignia, a preview of the relief is displayed.</i>	
Toggle visibility of cursor information.	Alt+C
Toggle visibility of currently active bitmap layer.	Alt+B

Create greyscale from composite relief.	Alt+G
 <i>If you are working in ArtCAM Insignia, you cannot create a greyscale from the relief.</i>	
View the model from the Top . (3D View window only.)	Ctrl+Num 5
View the model from the Bottom . (3D View window only.)	Ctrl+Num 0
View the model from the Left . (3D View window only.)	Ctrl+Num 4
View the model from the Right . (3D View window only.)	Ctrl+Num 6
View the model from the Front . (3D View window only.)	Ctrl+Num 2
View the model from the Back . (3D View window only.)	Ctrl+Num 8
Switch to Iso 1 view. (3D View window only.)	Ctrl+Num 1
Switch to Iso 2 view. (3D View window only.)	Ctrl+Num 3
Switch to Iso 3 view. (3D View window only.)	Ctrl+Num 9
Switch to Iso 4 view. (3D View window only.)	Ctrl+Num 7

Editing

The following shortcuts can be used when editing vectors or relief clipart:

Function	Shortcut
Select all objects (vectors and relief clipart).	Ctrl+A
Cut to ArtCAM clipboard.	Ctrl+X
Copy to ArtCAM clipboard.	Ctrl+C
Paste from ArtCAM clipboard.	Ctrl+Y
Undo.	Ctrl+Z

Redo.	Ctrl+Y
Delete selected objects.	Delete
Use the Node Editing tool.	N
Use the Transform tool.	T
Use the Envelope Distortion tool.	Ctrl+E
Nudge selected object up.	
Nudge selected object down.	
Nudge selected object right.	
Nudge selected object left.	
Open the Nudge Distance dialog.	Alt+Arrow key
Create copy of nudged object in its original position.	Ctrl+Alt+Arrow key
Measure tool.	M
Centre in model.	F9
Align vertical centre.	Shift+ 
Align horizontal centre.	Shift+ 
Align left.	Ctrl+ 
Align right.	Ctrl+ 
Align top.	Ctrl+ 
Align bottom.	Ctrl+ 
Exit current mode and return to Select tool.	Esc
Display the Shape Editor .	F12

Vectors

The following shortcuts can be used when you are working with vectors:

Function	Shortcut
Create vector and continue drawing.	Enter or Space Bar
Keep aspect ratio (<i>Create Rectangle only</i>).	Shift
Temporarily disable snapping on a vector layer.	Shift
Display the Tool Settings panel for the selected vector shape.	E
Display the Vector Clipping panel.	Ctrl+Alt+Shift+C
Display the Vector Slice panel.	Ctrl+Alt+Shift+V
Group selected vectors.	Ctrl+G
Ungroup selected vectors.	Ctrl+U
Reset the relief inside a selected vector	Ctrl+0
Reset the relief outside a selected vector	Ctrl+Alt+0

Bitmaps

The following shortcuts can be used when working with bitmap artwork:

Function	Shortcut
Toggle linking between primary and secondary colours.	Ctrl+L
Link all colours (except Primary and Secondary).	Ctrl+K
Unlink all colours.	Ctrl+R

Reliefs

The following shortcuts can be used when you are working with reliefs or relief clipart:

Function	Shortcut
Reset the currently active relief layer.	Shift+Delete
Copy relief.	Ctrl+Shift+C
Display the Offset Relief dialog.	Ctrl+Alt+Shift+O
Use the Cookie Cutter tool.	Ctrl+T
Create a copy using the Relief Cookie Cutter tool.	Ctrl+Shift+T
Paste relief clipart into the active relief layer.	Enter
Reset the relief inside a selected vector	Ctrl+0
Reset the relief outside a selected vector	Ctrl+Alt+0

Tool specific shortcuts

Some shortcuts are only available when you have a specific tool selected.

- Transform tool (see page 81)
- Node editor (see page 82)
- Text tool (see page 83)

Transform tool

The following shortcuts can be used when you are using the **Transform** tool to manipulate vectors or relief clipart.

Scale and Size shortcuts:

Function	Shortcut
Leave behind a copy of the selected object in its original position.	Ctrl+drag
Resize an object relative to its Transform Origin .	Alt+drag
Temporarily unlink the dimensions in the Scale and Size area.	Shift+drag

Move shortcuts:

Function	Shortcut
Leave a copy of the selected object in its original position.	Ctrl+drag
Restrict movement to the X and Y axes.	Alt+drag
Temporarily disable snapping.	Shift+drag

Rotate shortcuts:

Function	Shortcut
Leave behind a copy of the selected object in its original position.	Ctrl+drag
Rotate object in 15 degree increments.	Alt+drag
Temporarily disable snapping.	Shift+drag

Shear shortcuts:

Function	Shortcut
Leave a copy of the selected object in its original position.	Ctrl+drag
Temporarily disable snapping.	Shift+drag

Node Editing

The following shortcuts can be used when you are in **Node Editing** mode:

Function	Shortcut
Enter Node Editing mode.	N
Convert span (<i>linear or bezier</i>) to arc.	A
Convert span (<i>linear or arc</i>) to Bezier.	B
Convert span (<i>bezier or arc</i>) to line.	L
Cut span.	C
Remove span.	R
Insert node.	I
Insert start node <i>or</i> change node to start node.	P
Toggle smoothing on node.	S
Delete node.	D
Align selected nodes in X-axis.	X
Align selected nodes in Y-axis.	Y
Nudge selected node up.	
Nudge selected node down.	
Nudge selected node right.	
Nudge selected node left.	
Open the Nudge Distance dialog.	Alt+Arrow key

Text tool

The following shortcuts can be used when using the **Text** tool:

Function

Move a word.

Move a character.

Start a new line of text.

Delete a character.

Shortcut

Ctrl+drag

Alt+drag

Enter

Backspace

Polyline tool

The following shortcuts can be used when using the **Polyline** tool:

Function	Shortcut
Toggle Draw smooth polylines .	S
Toggle Add to existing line .	E
Temporarily disable snapping.	Shift+drag
Constrain angle of linear span between nodes to 15 degree increments.	Ctrl+drag
Close polyline to create polygon and continue drawing.	Tab
Create polyline and continue drawing.	Space Bar

Using the mouse

The way in which your mouse can be used in ArtCAM often changes according to which design window is displayed and the particular aspect of the model on which you are working. If you own a mouse with a wheel this increases the range of options available to you.

You can click buttons or objects with or without keyboard modifier keys (*Alt*, *Shift*, *Ctrl*) to alter the way you can create, select, move, edit or view models on the screen. The following terms are used in the documentation:

- **Click** — Press and release the left mouse button.
- **Double-click** — Rapidly click the left mouse button twice.
- **Drag** — Hold down the left mouse button and move the mouse while holding the button down.
- **Move** — Move the mouse without selecting any of the mouse buttons.

When other mouse buttons are to be used, the required button is specified; for example

- **Middle-click**
- **Right-click**

The cursor that is displayed when you use the mouse reflects the operation that is being carried out.

Common mouse controls

2D View

You can use the mouse to manipulate the **2D View** in the following ways:

ArtCAM Function	Mouse Action
Magnify view by 50%.	
Reduce view by 50%.	
Zoom in.	
Zoom out.	

3D View

You can use the mouse to manipulate the **3D View** in the following ways:

ArtCAM Function	Mouse Action
Rotate view.	
Zoom.	
Pan view.	
Zoom in.	
Zoom out.	

Vectors

You can use the mouse relative to vector artwork in the following ways:

ArtCAM Function

Select vector (*also select node in node editing mode*).

Select multiple vectors.

Copy vector.

Display context menu.

Display **Shape Editor**.

Mouse Action



on selected vector.

on selected vector.

on selected vector.

Bitmaps

You can use the mouse relative to bitmap images shown in the **2D View** in the following ways:

ArtCAM Function

Select primary colour.

Select secondary colour.

Link colour to primary colour.

Display **Shape Editor**.

Mouse Action



on colour swatch in colour palette.

on colour swatch in colour palette.

on colour swatch in colour palette.

on colour swatch in colour palette, 2D View or 3D View.

Toolpaths

You can use the mouse relative to toolpaths in the following ways:

ArtCAM Function

Edit toolpath.

Mouse Action



on 2D toolpath preview or toolpath name.

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