
ArtCAM 2015 R2

What's New



Build 2015.7XX

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Acknowledgements

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Patents

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

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

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

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

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

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

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

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

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

Patent Application: GB 2492225 "Texture Flow"

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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What's New in ArtCAM 2015 R2

ArtCAM 2015 R2 offers all the original features of ArtCAM 2015, but with numerous improvements. This document describes the most significant improvements.

Visit the website at <http://www.artcam.com/> for the latest news and videos.

Summary of new features

ArtCAM 2015 R2 contains the following new features and enhancements.

In all variants of ArtCAM:

- **3D-printing reliefs** (see page 16) — You can prepare reliefs for 3D-printing.
- **Using the Draw Bitmap Line tool** (see page 41) — You can now use this tool in the **3D View** window.
- **Identifying snap points** (see page 42) — There is a new **Snap Hints** option on the **View > Snapping** menu that enables you to identify potential snap points.
- **Changing the thickness of vectors** (see page 43) — You can change the thickness of vectors in both the **2D** and **3D View** windows.
- **Creating fillets** (see page 44) — There are three new fillet types available from the **Tool Settings: Fillet Vectors** panel.
- **Exporting true geometry** (see page 45) — You can now export circles as true circles instead of as Beziérs and arcs.
- **Merging vector layers** (see page 46) — You can merge multiple vector layers that are selected in the Project Tree.
- **Importing and exporting vectors** (see page 48) — There are new import and export options available from the **Vector Layers** panel and **Vector** item context menus.
- **Preserving vector colour information** (see page 51) — Use the new **Split colours into separate layers** option to control how ArtCAM imports coloured vectors.
- **Using rulers in the 3D View window** (see page 53) — There are now rulers in the **3D View** window.
- **Interactively editing the Z height of relief clipart** (see page 55) — A new control arrow enables you to adjust the Z height of relief clipart when the **Transform** tool is open.
- **Searching the libraries** (see page 68) — There is a new search field in the **Relief Clipart Library** panel, **Component Library** panel, and **Vector Library** panel.
- **Selecting multiple toolpaths** (see page 72) — You can select multiple toolpaths from different parent groups.
- **Simulating toolpaths** (see page 74) — Toolpath simulation is now much faster

- **Miscellaneous changes** (see page 74) — There are several small changes to ArtCAM.

In ArtCAM Insignia, ArtCAM Pro, and ArtCAM Jewelsmith only:

- **Exporting relief slices to .dxf** (see page 55) — You can export relief slices as `.dxf` files.
- **Live Weave tool** (see page 63) — The **Tool Settings: Weave Tool** panel replaces the **Weave Wizard** dialog, and the tool now works in real-time.
- **Creating constant height letters** (see page 67) — You can create constant height lettering using the **Shape Editor** panel.

In ArtCAM Pro and ArtCAM Jewelsmith only:





- **Working with assemblies** (see page 4) — There are several changes to the way in which you can work with assemblies.
- **3D-printing assemblies** (see page 18) — You can prepare assemblies for 3D-printing.
- **Creating relief layer groups** (see page 54) — You can create relief layer groups in the **Front Relief** and **Back Relief** layer stack.
- **Sharing your Relief Height Analysis settings** (see page 56) — You can share your relief height analysis settings between workstations.
- **Texture Flow tool update** (see page 57) — You can choose to keep the generated texture relief clipart as relief clipart rather than pasting it directly onto the active relief layer.
- **Live Contour Blend tool** (see page 66) — The relief updates in real-time so you can instantly see results.
- **Controlling the direction of the offset in 3D Offset strategies** (see page 70) — You can now whether to start offsetting from the inside or the outside of the clearance area.
- **Setting a threshold for surface links in 3D Offset and Constant Z strategies** (see page 71) — There is a new **Surface Links** option when you are creating **3DOffset**, **3DOffset Spiral**, or **Constant-Z** finishing strategies.

In ArtCAM Jewelsmith only:

- **Live Two Rail Ring Sweep** (see page 61) — The relief updates in real-time when you use the **Two Rail Ring Sweep** tool.

Working with assemblies


In ArtCAM Pro and ArtCAM Jewelsmith, there are several changes to the way in which you can work with assemblies:

- The appearance of the panels (see page 4) is improved.
- You can now group assembly items (see page 9).
- The behaviour of the **Lay On Surface** (see page 9)  tool is updated.
- There are three new tools:
 -  **Create New 3D Print Job** (see page 18).
 -  **Batch Assembly** (see page 10).
 -  **Transform** (see page 6).

Changes to the mesh, gem, and assembly panels

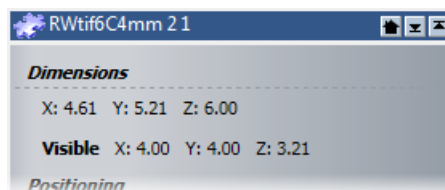
In ArtCAM Pro and ArtCAM Jewelsmith, there are changes to the layout of the panels when you are working with assemblies.

On mesh, gem, and assembly panels:





- There is a new **Transform** (see page 6)  option.
- Section headers no longer fold up and down when you click them.

On mesh and assembly panels:

- There is a new **Dimensions** area. The top row of the **Dimensions** area displays the combined dimensions of all visible and hidden meshes within an assembly, or the dimensions of a selected mesh. The bottom row of the **Dimensions** area, labelled **Visible**, displays the dimensions of the visible parts of a selected assembly.



On assembly panels:

- The **Properties** area of the panel is removed. The **Edit Object Attributes**  and **Edit Object Shading**  buttons are now in the **Tools** area of the panel.
- There is a new **Children** area, which contains the options that create children of an **Assembly** item in the Project Tree.
- The **Libraries** area is removed. The **Component Library** button is in the new **Children** area.
- There are two new options:
 -  **Batch Assembly** (see page 10).
 -  **Create New 3D Print Job** (see page 18).

Assembly transform



There is a new **Transform** button in the **Positioning** area of the assembly, mesh, and gem panels. This option enables you to interactively move, rotate, and scale the selected assembly component, mesh, or gem item using the control handles that are displayed in the **3D View** window.

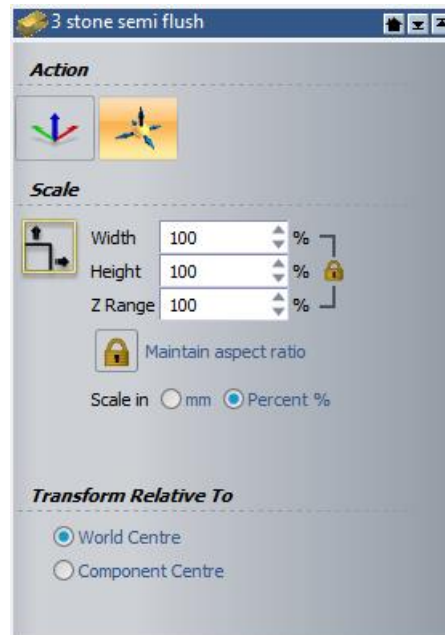
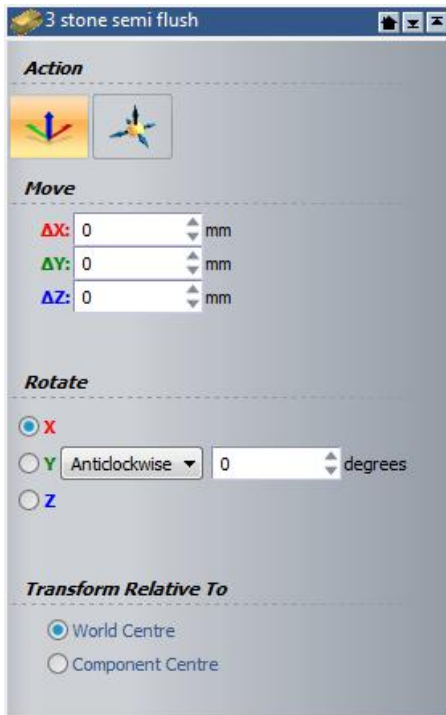
When you have an assembly, a mesh, or a gem selected, click



Transform to display the transform settings below the splitter bar. The settings change depending on which action is selected.

Transform settings with Nudge selected:

Transform settings with Scale selected:

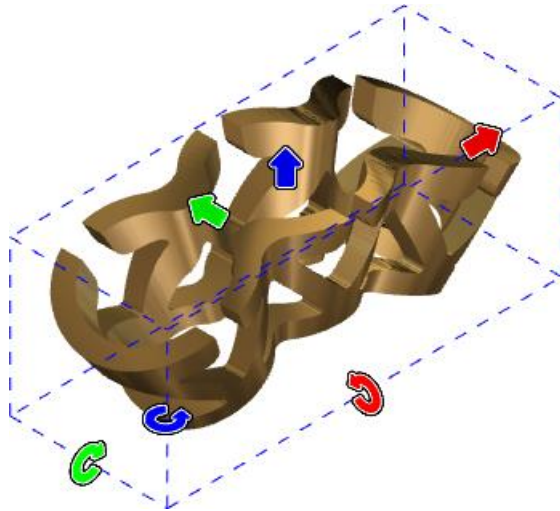


The following settings are available:

Action — Select the transform action you want to perform.



- **Nudge** — Click to enter nudge mode. In the **View** window, a bounding box with control handles is drawn around the item. Use **Nudge** to move the selected object around the **View** window.



— Drag this handle to rotate the item about the X axis.



— Drag this handle to rotate the item about the Y axis.



— Drag this handle to rotate the item about the Z axis.



— Drag this handle to move the item along the X axis.



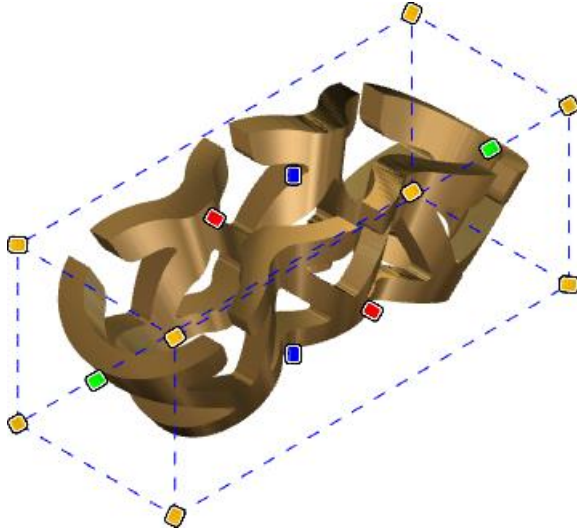
— Drag this handle to move the item along the Y axis.







— Drag this handle to move the item along the Z axis.



- **Scale** — Click to enter scale mode. In the **View** window, a bounding box with control handles is drawn around the item. Use **Scale** to resize the selected object.







-  — Drag this handle to scale the item along the X axis.
-  — Drag this handle to scale the item along the Y axis.
-  — Drag this handle to scale the item along the Z axis.
-  — Drag this handle to scale the item in all directions.

Move — Enter values in the **X**, **Y**, and **Z** fields, then click **Apply** to move the selected item an exact distance. This area is available only if you are in nudge mode.

Rotate — Select an axis and choose a direction, then enter a degree value in the field to rotate the selected item by an exact amount. This area is available only if you are in nudge mode.

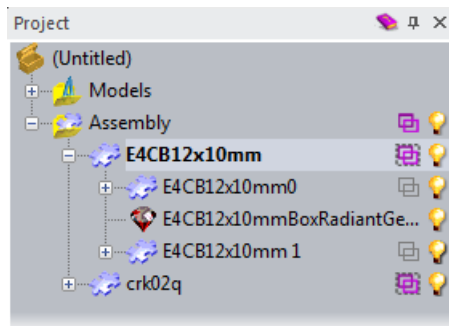
Scale — Enter values in the **Width**, **Height**, or **Z Range** fields to scale the selected item by an exact amount. This area is available only if you are in scale mode.


-   **Maintain Aspect Ratio** — When selected () , the proportions of the selected item are preserved. When deselected () , the proportions are not preserved.
- **Scale in** — Select whether to set the selected item's size in length units or as percentage of the original size.


Transform Relative To — Select whether to transform the selected item relative to the **World Centre** or the **Component Centre**.

Grouping assembly items

Assemblies often contain many items and sub-assemblies. You can group an assembly so that when you click any of its sub-components in the **View** window, it selects the grouped assembly. This makes it easier to select the correct item in the **View** window and perform operations on it.




The  icon is displayed in the Project Tree beside grouped assemblies. When a top level assembly is grouped, the group icons of its sub-assemblies are greyed-out. You can still click the greyed-out icons to group or ungroup items that are nested within parent groups.

The  icon is displayed in the Project Tree beside ungrouped assemblies. When assemblies are ungrouped, you can select their individual components separately.

Lay on surface





Use the **Lay on Surface** tool to move a component around the surface of a model. In ArtCAM Pro and ArtCAM Jewelsmith 2015 R2 you can now click and drag grouped components (see page 9) as one object. For example, if you click and drag a gem, every item that is grouped under the same parent as that gem is dragged as one. Previously, you had to hold down the **Shift** key while dragging to move a component and all items sharing the same parent.

If you want to move items individually, click the grouped  icon to ungroup assembly items in the Project Tree.

Batch assemblies

In ArtCAM Pro and ArtCAM Jewelsmith, there is a new **Batch**

Assembly  button on the **Assembly** panel, which enables you to create multiple copies of an assembly. This can be useful if you want to print multiple copies of a model in the same 3D-printing job.


The **Batch Assembly** tool is similar to the **Block Copy**  tool, but only one item is created in the Project Tree no matter how many copies you create. This makes the Project Tree much more manageable. In addition, you can continue to make changes to your assembly after creating a **Batch Assembly**, and these changes are automatically made to each copy. For example, if you use the **Transform** tool to scale the size of your assembly, the transform bounding box is drawn only around the original assembly, but each copy is scaled concurrently with the original.



File sizes for exported batch assemblies are much smaller than file sizes for the same number of copies created by **Block Copy** because ArtCAM saves only one copy instead of saving data for each copy.

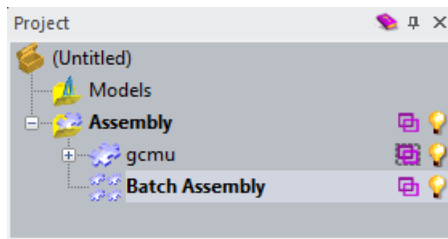
To create a batch assembly for 3D-printing:



- 1 Import or create an assembly.

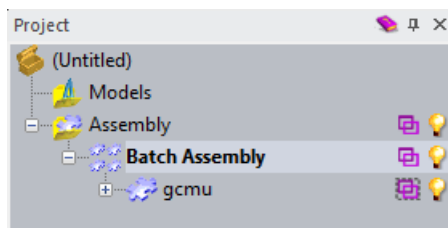



- 2 In the Project Tree, select the root **Assembly**  item to display the **Assembly** panel below the splitter bar.

- 3 On the **Assembly** panel, click **Batch Assembly** . A **Batch Assembly**  item is created in the Project Tree below your assembly.



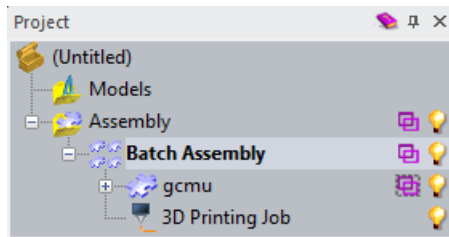
- 4 Drag the assembly  and drop it onto the **Batch Assembly**  item to add it to the batch assembly.




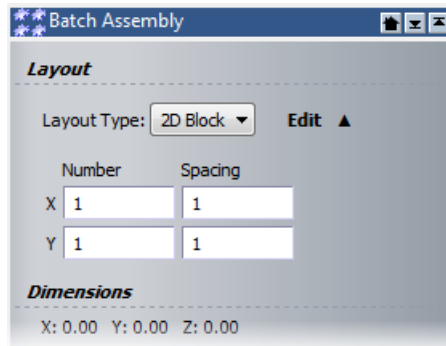
- 5 Select the **Batch Assembly**  item to display its panel below the splitter bar.



- 6 Click **Create New 3D Print Job**  to create a **3D Printing Job**  item within the batch assembly.

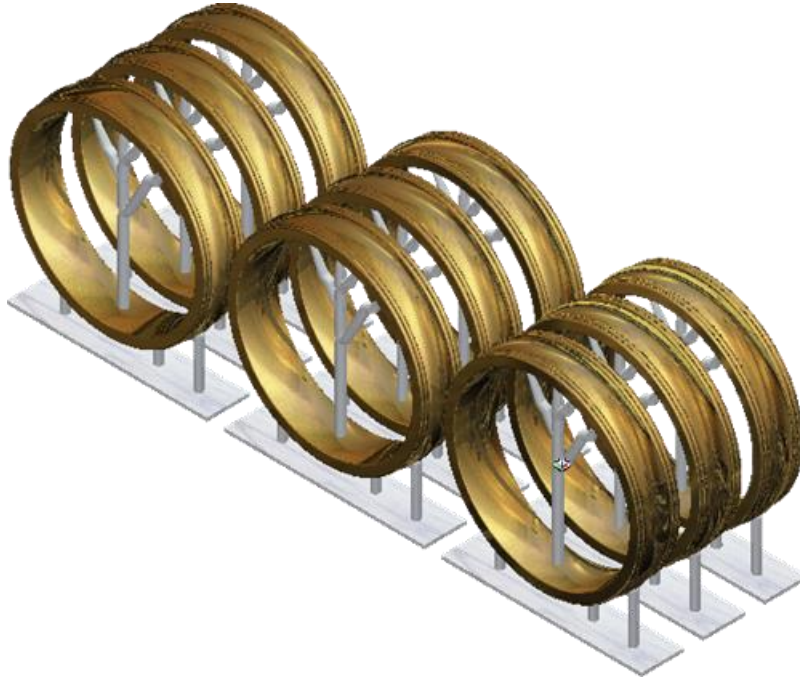


- 7 Use the settings on the **3D Printing Job** (see page 18) panel to create supports for your model.
- 8 Select the **Batch Assembly**  item in the Project Tree to display its panel below the splitter bar.
- 9 In the **Layout** area:
- Select **2D Block** to create one layer of copies.
 - Select **3D Block** to create multiple layers of copies.
- 10 Click **Edit** to display the **Number** and **Spacing** fields.

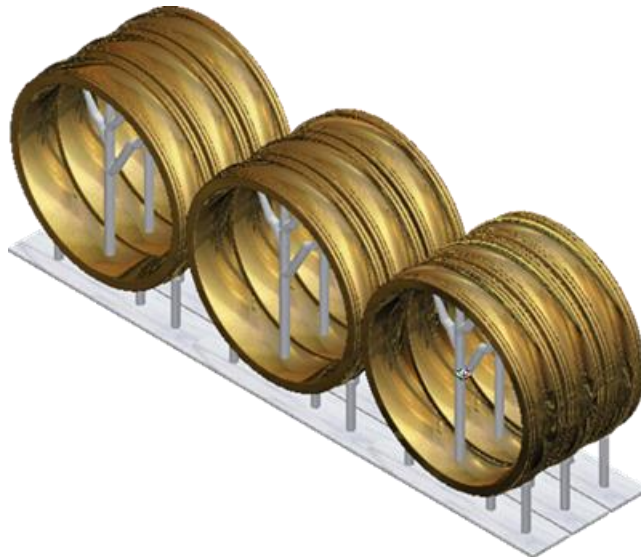


- a In the **Number** fields, enter the number of meshes you want in the X, Y, and Z directions. The **Z** field is available only if you have **3D Block** selected.
- b In the **Spacing** fields, enter the distance between each mesh in the X, Y, and Z directions. The **Z** field is available only if you have **3D Block** selected.

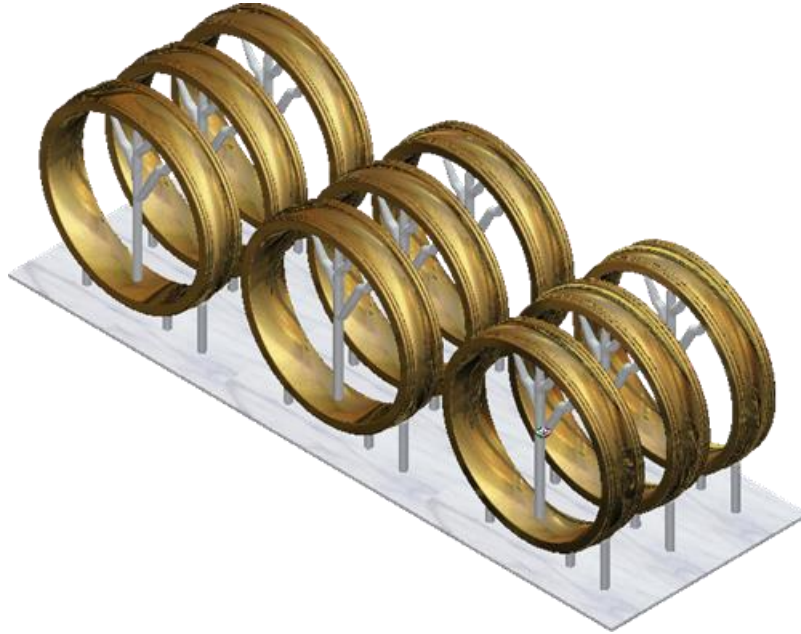
In this example the batch assembly is laid out in a **2D Block**, with 3 meshes in X and Y, and a spacing of 1 between each one.



- 11 If you are creating a batch assembly for 3D-printing, it can be beneficial to have the bases of the copies join together so that all the copies are on one base. To do this:
 - a In the **Layout** area, reduce the **X** and **Y Spacing** values to **0**. This removes the spacing between the bases, but causes the copies to touch, which is not ideal.



- b In the **3D Printing Job** panel, increase the **Border thickness** value until there is adequate room around each copy.



- 12 To export the copies as one 3D-printing job, right-click the **Batch Assembly** item to display its context menu and select **3D Print**. The **3D Print** panel (see page 30) is displayed.
- 13 On the **3D Print** panel, select your printer and export your batch assembly. For more information on the settings available on this panel, refer to the Reference Help.

3D-printing reliefs and assemblies

In all variants of ArtCAM, you can now prepare reliefs for 3D printing (see page 16). In ArtCAM Pro and ArtCAM Jewelsmith only, you can also prepare assemblies for 3D printing (see page 18).

3D-printing reliefs

In ArtCAM 2015 R2, you can export any relief or relief layer for 3D-printing. ArtCAM can export reliefs as [.tar.gz](#) files, which are compatible with the Ember printer, or [.stl](#) files, which are compatible with many other printers. If you do not own a 3D printer, you can export your relief to [.stl](#), and then search on the internet to find a 3D-printer local to you.



You must ensure your model dimensions do not exceed the build volume of your printer.


You can export reliefs from the **Front Relief** or **Back Relief** layer stack, but ArtCAM ignores any negative heights, meaning the relief always has a flat base. This flat base means that the relief is stable enough to be printed without supports.

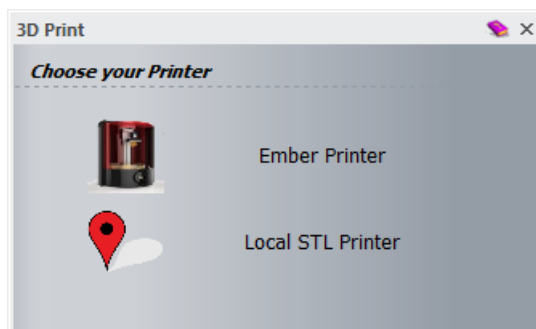


Relief layers are available only in ArtCAM Pro and ArtCAM Jewelsmith.

To prepare your relief for printing in ArtCAM Insignia, ArtCAM Pro, or ArtCAM Jewelsmith:

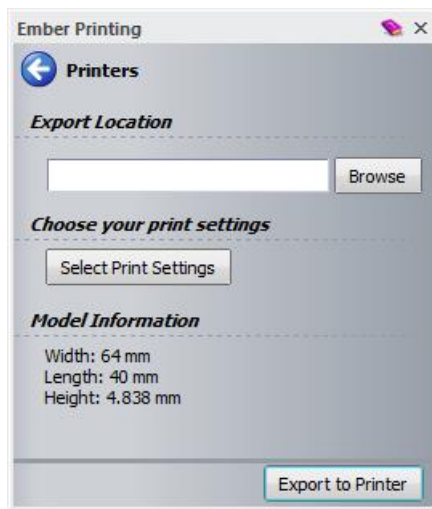
- 1 Ensure the relief you want to print is visible.

- 2 Click **Print Relief**  on the **Relief Layers** panel. The **3D Print** panel is displayed.

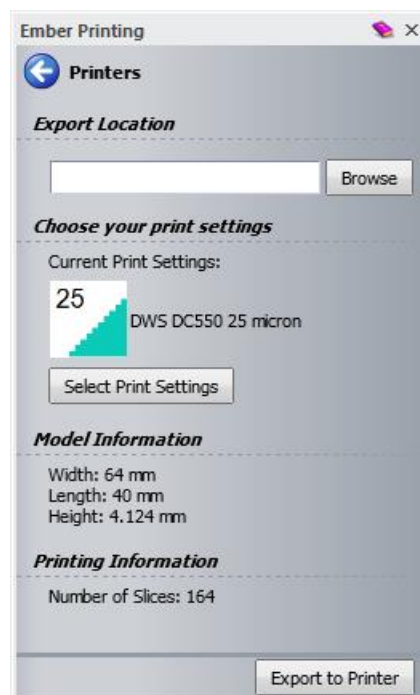


3 Select your printer:

Ember Printer — Select to display the **Ember Printing** panel and export the relief as a [.tar.gz](#) file.



- a Click **Browse** and then navigate to the location in which you want to save the exported file.
- b Click **Select Print Settings** to display the **Print Settings Selector** panel. These settings provide the printer with information, such as layer thickness, and relate to the material you are using. You can use the default print settings provided by ArtCAM, or you can create your own. For more information, see the Reference Help.
- c After you select your print settings, the **Printing Information** area is added to the panel. This area displays the number of slices in which the relief will be printed.

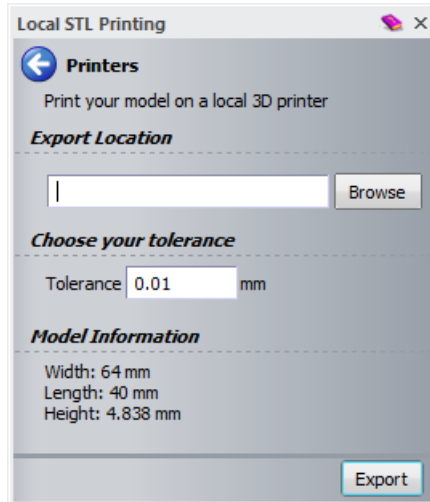


- d Click **Export to Printer** to export your relief to a [.tar.gz](#) file.



If your model exceeds the dimensions supported by the Ember printer, 64x40x134mm, an error message is displayed and your model is not exported.

Local STL Printer — Select to display the **Local STL Printer** panel and export the relief as an [.stl](#) file.



- a Click **Browse** and then navigate to the location in which you want to save the exported file.
- b The relief must be triangulated in order to export it to an [.stl](#) file. In the **Tolerance** field, enter a tolerance to specify how closely the triangulation must stay to the relief. The lower the value, the more accurate the triangulation is, but increased accuracy means the process is slower.
- c Click **Export** to export the relief to an [.stl](#) file.



*If you are working with ArtCAM Express, select **File > Print Relief** to print your relief.*


3D-printing assemblies

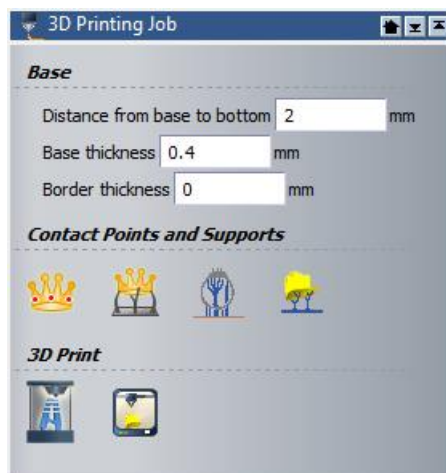
In ArtCAM Pro and ArtCAM Jewelsmith 2015 R2, you can prepare assemblies for 3D printing.

Before you print certain assemblies, such as rings, you must create supports so that the assembly does not move. These supports attach the assembly to a base and keep it stable while it is being printed, and then must be manually removed after printing.

To prepare an assembly that requires supports for printing, use the settings on the **3D Printing Job** panel. Click **Create New 3D Print Job**





on the **Assembly** panel to create a **Printing Job**  item in the Project Tree, then select this item to display the **3D Printing Job** panel.



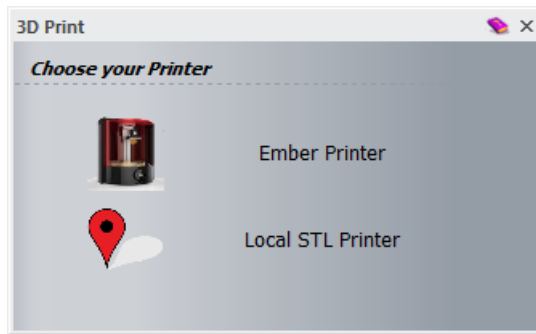
The locations of the supports are determined by contact points, which you can add to your assembly manually, or generate automatically.

To automatically generate contact points and supports, click:

-  **Create Supports** (see page 20) to generate contact points and supports in one action; or
-  **Create a Contact Point Group** (see page 24) to generate contact points first, then generate supports.

You can also manually edit or create support types (see page 34), position your contact points (see page 36), and edit the position of the generated supports (see page 39).

Some assemblies can be printed without the need for supports to hold them in place. If you want to prepare an assembly for 3D printing without creating supports (see page 30), right-click the assembly in the Project Tree and select **3D Print**. This displays the **3D Print** panel, which enables you to select your printer and export your assembly to an **.stl** or **.tar.gz** file.





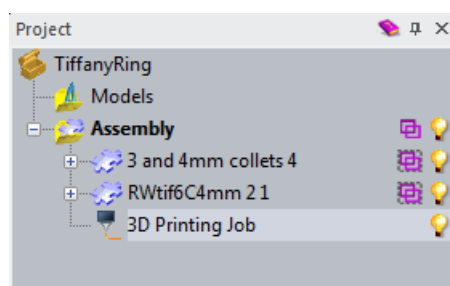
Using the Create Supports button


To prepare a model for 3D printing using the **Create Supports** button in ArtCAM Pro and ArtCAM Jewelsmith:

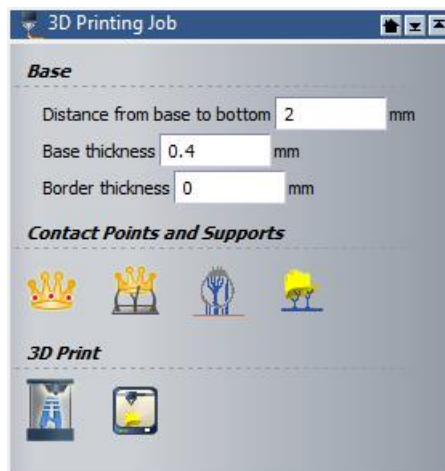
- 1 Import or create a mesh, component, or assembly.



- 2 In the Project Tree, select the **Assembly** item to display the **Assembly** panel below the splitter bar.
- 3 Click **Create New 3D Print Job** . A **3D Printing Job**  item is created in the Project Tree below the **Assembly** item.



- 4 Select the **3D Printing Job**  item to display the **3D Printing Job** panel.

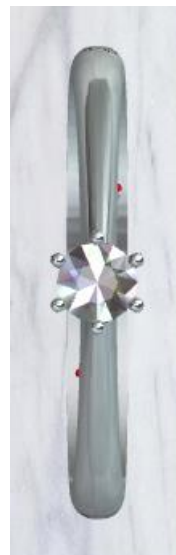


- 5 When supports are generated, a base is created. The base must be thick enough to support the part, and there must be space for supports between the bottom of the part and the top of the base.
- a Enter a value in the **Distance from base to bottom** field. If the distance is too small, the supports are not created.
 - b Enter a value in the **Base thickness** field.
 - c If you want to increase the size of the base around the model, enter a value in the **Border thickness** field.

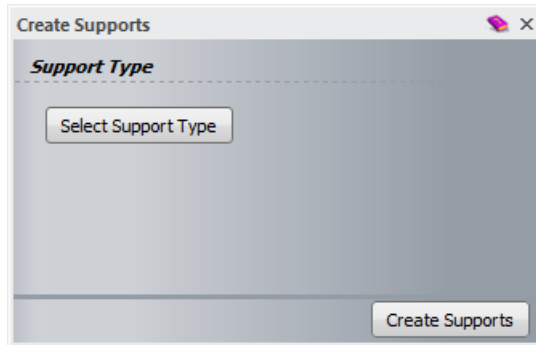
Border thickness of 0 mm



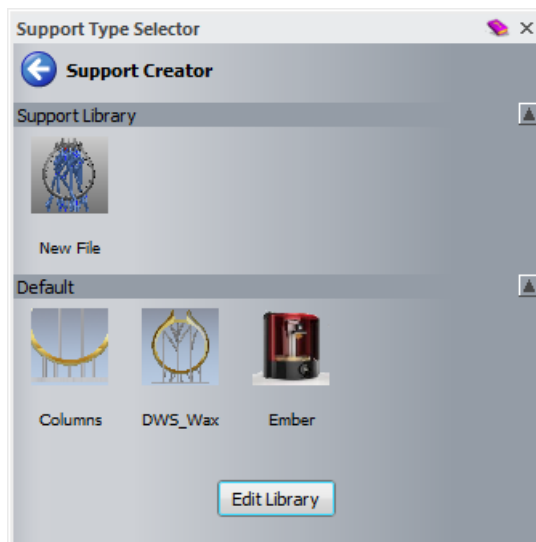
Border thickness of 2 mm



- 6 Click **Create Supports** . The **Create Supports** panel is displayed.



- 7 You must select a support type so that ArtCAM knows what type of support to generate. Click **Select Support Type** to display the **Support Type Selector** panel. This panel contains the default support types and any custom support types you have created. If you want to add or edit any support types (see page 34), click **Edit Library** to display the **Support Library** panel.

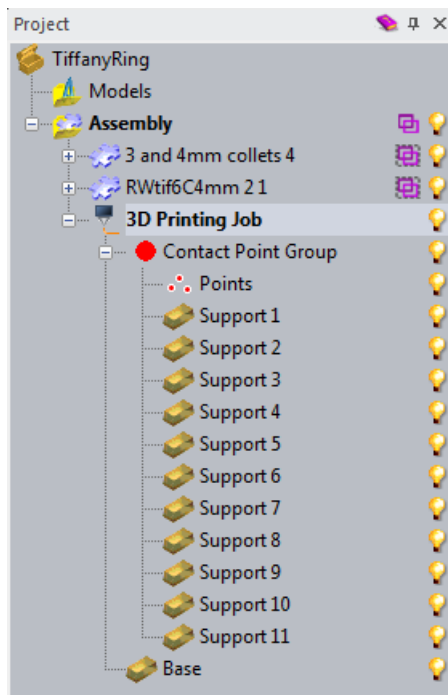


- 8 Select the support type you want to generate. The selected support type is displayed in the **Support Type** area of the **Create Supports** panel.

- 9 Click **Create Supports**. ArtCAM generates contact points on the model, then generates the supports from these contact points.



In the Project Tree, a **Contact Point Group** item is created under the **3D Printing Job** item.




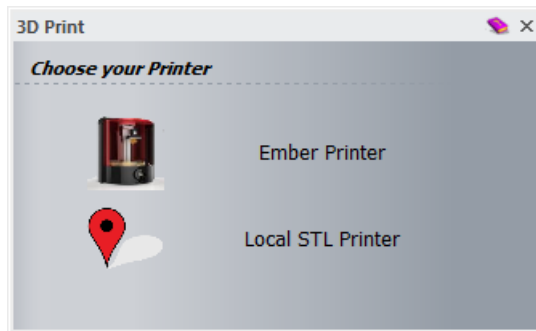
*If supports are not generated at the bottom of the part, increase the **Distance from base to bottom** value in the **3D Printing Job** panel to give the supports more space, then*



*click on the **Contact Point Group** panel to regenerate the supports.*

- 10 If the supports are not in the correct place, you can edit the position of the contact points or delete individual supports (see page 39) until you are happy with their position.
- 11 When the supports are in the correct position, select the **3D Printing Job** item in the Project Tree to display the **3D Printing Job** panel.

- 12 Click **3D Print**  to display the **3D Print** panel.



- 13 Select which printer you want to use and export your model:
 - **Ember Printer** — If you have an Ember printer, select this option to display the **Ember Printing** panel and export your model as a [.tar.gz](#) file.
 - **Local STL Printer** — If you have an STL printer, or want to send the files to an STL printer in your local area, select this option to display the **Local STL Printer** panel and export your model as an [.stl](#) file.

Using the Create Contact Point Group button

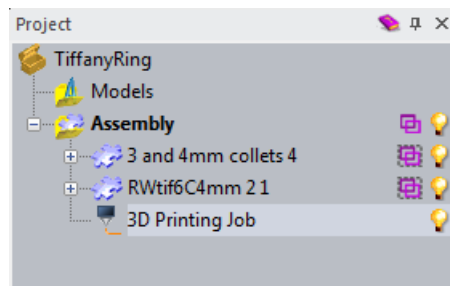
To prepare a model for 3D printing using the **Create Contact Point Group** button in ArtCAM Pro and ArtCAM Jewelsmith:


- 1 Import or create a mesh, component, or assembly.

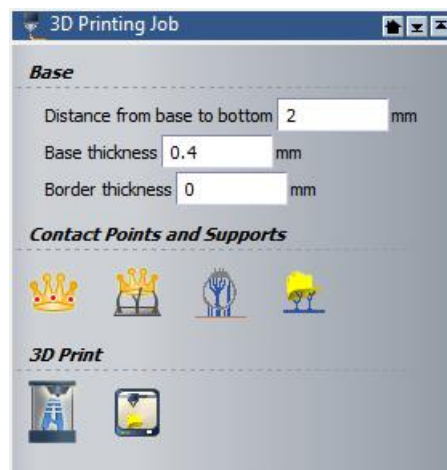


- 2 In the Project Tree, select the **Assembly** item to display the **Assembly** panel below the splitter bar.

- 3 Click **Create New 3D Print Job** . A **3D Printing Job**  item is created in the Project Tree below the **Assembly** item.



- 4 Select the **3D Printing Job**  item to display the **3D Printing Job** panel.




- 5 When supports are generated, a base is created. The base must be thick enough to support the part, and there must be space for supports between the bottom of the part and the top of the base.
 - a Enter a value in the **Distance from base to bottom** field. If the distance is too small, the supports are not created.
 - b Enter a value in the **Base thickness** field.
 - c If you want to increase the size of the base around the model, enter a value in the **Border thickness** field.

Border thickness of 0 mm

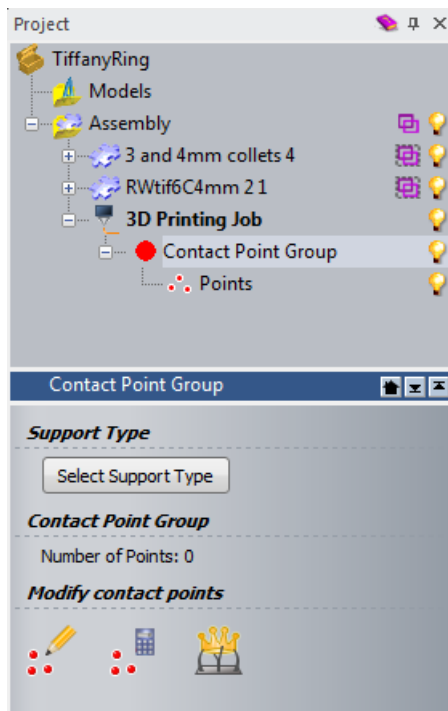


Border thickness of 2 mm

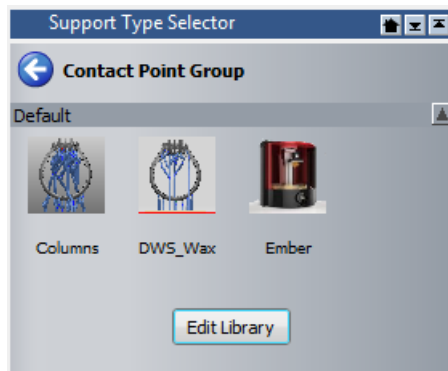


- 6 Click **Create a Contact Point Group** . A **Contact Point Group** item (see page 37) is added below the **3D Printing Job** item. You can create as many contact point groups as you like, and each group is assigned a different colour.

- 7 Select the **Contact Point Group** item to display its panel.




- 8 You must select a support type before generating contact points. Click **Select Support Type** to display the **Support Type Selector** panel. This panel contains the default support types and any custom support types you have created. If you want to add or edit any support types (see page 34), click **Edit Library** to display the **Support Library** panel.




- 9 Select the support type you want to generate. The selected support type is displayed in the **Support Type** area of the **Contact Point Group** panel.

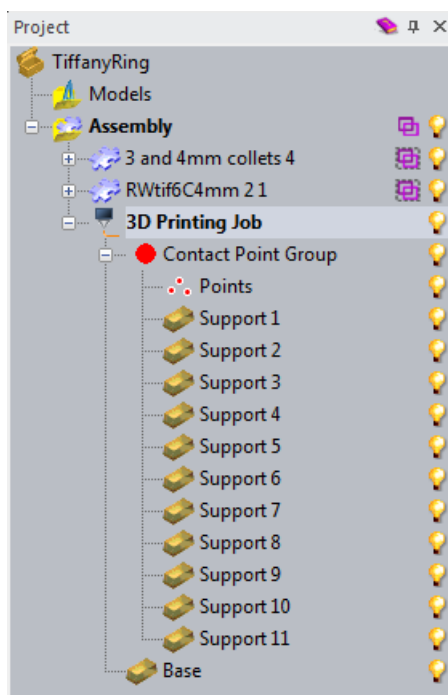
10 You can now create the contact points. Click **Automatically**

Generate Contact Points . Contact points are generated on the mesh in the colour assigned to the **Contact Point Group** item in the Project Tree. Contact points determine where the supports attach to the mesh. If they are not in the correct position, you can edit them or position them manually (see page 36).



11 When the contact points are positioned where you want, click

Generate Supports . ArtCAM generates the supports and creates a base for the supports to attach to. In the Project Tree, an individual mesh item is created for each support and the base. The supports are added to the **Contact Point Group** containing the contact points that they were generated from.



In the **View** window, you can see how the model looks with supports and a base generated.



*If supports are not generated at the bottom of the mesh, increase the **Distance from base to bottom** value in the **3D Printing Job** panel to give the supports more space, then*

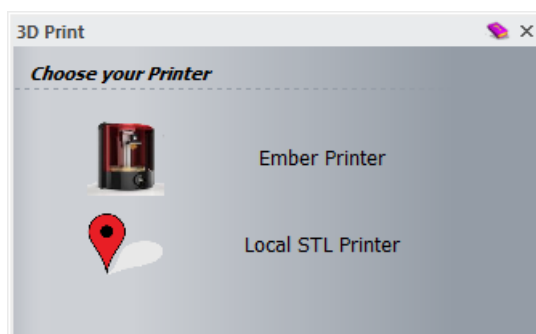


*click on the **Contact Point Group** panel to regenerate the supports.*

- 12** If the supports are not in the right place, you can edit the position of the contact points or delete individual supports (see page 39) until you are happy with their position.
- 13** When the supports are in the correct position, select the **3D Printing Job** item in the Project Tree to display the **3D Printing Job** panel.



- 14** Click **3D Print** to display the **3D Print** panel.



- 15** Select which printer you want to use, then export your model:

- **Ember Printer** — If you have an Ember printer, select this option to display the **Ember Printing** panel and export your model as a [.tar.gz](#) file.
- **Local STL Printer** — If you have an STL printer, or want to send the files to an STL printer in your local area, select this option to display the **Local STL Printer** panel and export your model as an [.stl](#) file.

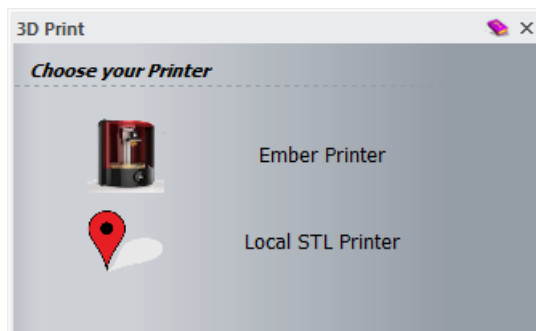
Using the 3D Print panel to export assemblies for 3D-printing

In ArtCAM Pro and ArtCAM Jewelsmith, you can quickly and easily export assemblies for 3D-printing using the **3D Print** panel. Use this method if your assembly does not require supports to keep it in place during the printing process, for example, if it has a flat base.

You can choose to export any assembly or sub-assembly for 3D-printing, or export everything contained within the top level **Assembly** item.

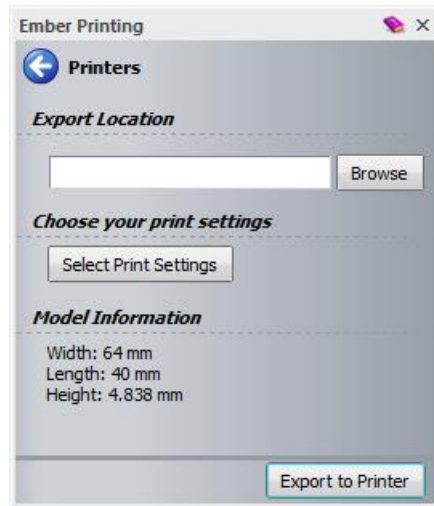
To export an assembly or sub-assembly for 3D-printing using the **3D Print** panel:

- 1 Ensure the components you want to export are visible.
- 2 In the Project Tree, right-click the assembly item you want to export, then select **3D Print** from the context menu. The **3D Print** panel is displayed.

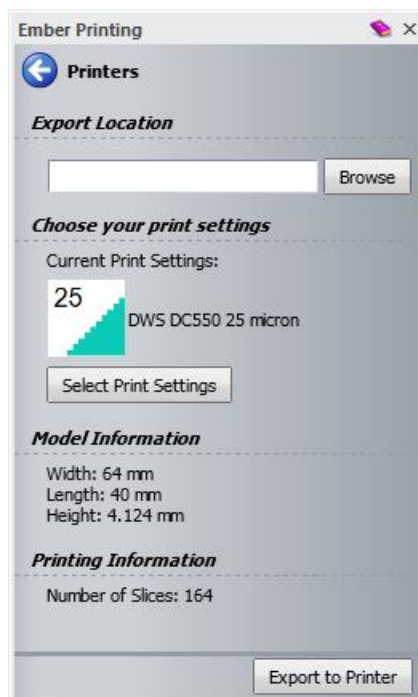


- 3 Select which printer you want to use and export your assembly:

- **Ember Printer** — Select to display the **Ember Printing** panel and export your assembly as a **.tar.gz** file.



- a Click **Browse** and then navigate to the location in which you want to save the exported file.
- b Click **Select Print Settings** to display the **Print Settings Selector** panel. These settings provide the printer with information, such as layer thickness, and relate to the material you are using. You can use the default print settings provided by ArtCAM, or you can create your own. For more information, see the Reference Help.
- c After you select your print settings, the **Printing Information** area is added to the panel. This area displays the number of slices in which the relief will be printed.

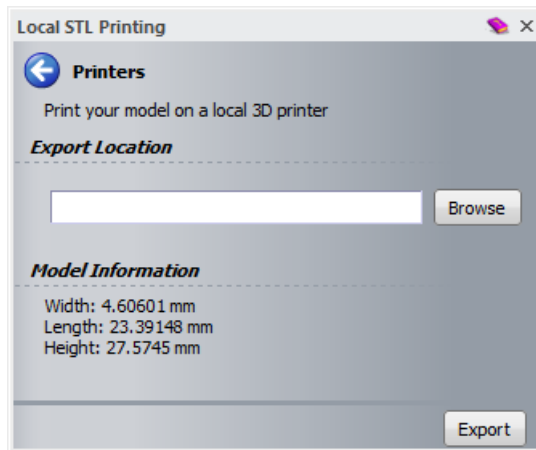


- d Click **Export to Printer** to export your relief to a **.tar.gz** file.



If your model exceeds the dimensions supported by the Ember printer, 64x40x134mm, an error message is displayed and your model is not exported.

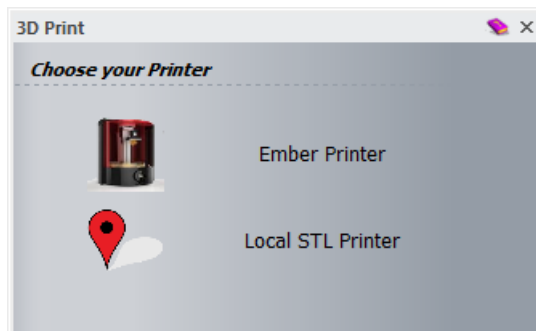
- **Local STL Printer** — Select to display the **Local STL Printer** panel and export your assembly as an **.stl** file.



- a Click **Browse** and then navigate to the location in which you want to save the exported file.
- b Click **Export** to export the relief to an **.stl** file.

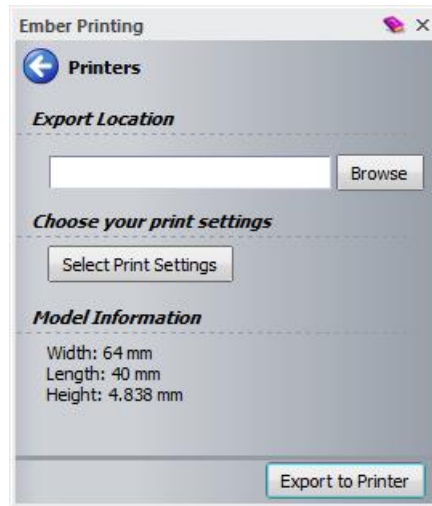
To export everything under the top level **Assembly** item in the Project Tree for 3D-printing using the **3D Print** panel:

- 1 Ensure the items you want to export are visible.
- 2 Select **File > 3D Print > Print Project**. The **3D Print** panel is displayed.

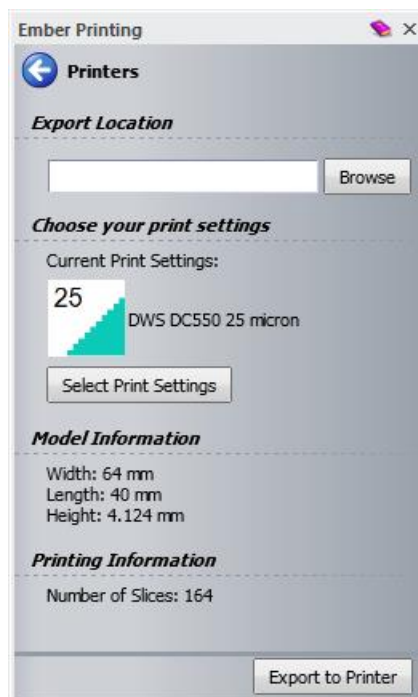


- 3 Select which printer you want to use and export your assembly:

- **Ember Printer** — Select to display the **Ember Printing** panel and export your assembly as a **.tar.gz** file.



- a Click **Browse** and then navigate to the location in which you want to save the exported file.
- b Click **Select Print Settings** to display the **Print Settings Selector** panel. These settings provide the printer with information, such as layer thickness, and relate to the material you are using. You can use the default print settings provided by ArtCAM, or you can create your own. For more information, see the Reference Help.
- c After you select your print settings, the **Printing Information** area is added to the panel. This area displays the number of slices in which the relief will be printed.

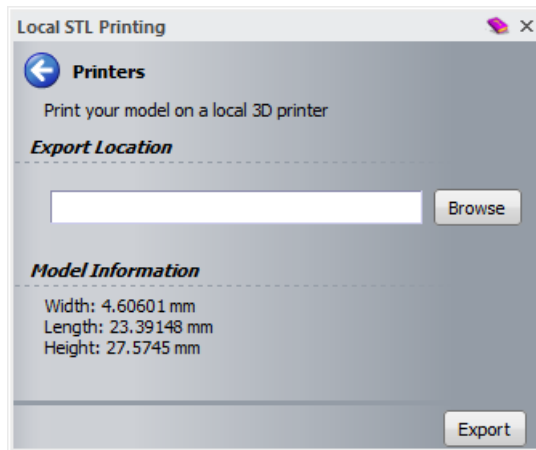


- d Click **Export to Printer** to export your relief to a **.tar.gz** file.



If your model exceeds the dimensions supported by the Ember printer, 64x40x134mm, an error message is displayed and your model is not exported.

- **Local STL Printer** — Select to display the **Local STL Printer** panel and export your assembly as an **.stl** file.



- a Click **Browse** and then navigate to the location in which you want to save the exported file.
- b Click **Export** to export the relief to an **.stl** file.

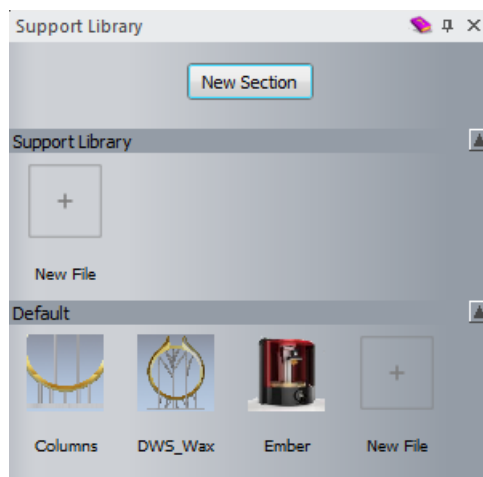
Editing support types


You can create new support types using the **Support Library** panel, and then edit their parameters using the **Support Parameter Editing** panel, or edit the default support types supplied with ArtCAM.

Creating a new support type

To create a new support type:

- 1 In the **3D Printing Job** panel, click **Support Library**  to display the **Support Library** panel.



The **Support Library** is divided into sections, and each section has a **New File**  button.


- 2 Click the **New File** button in the section to which you want to add the support type. A support type called **New File** is created.

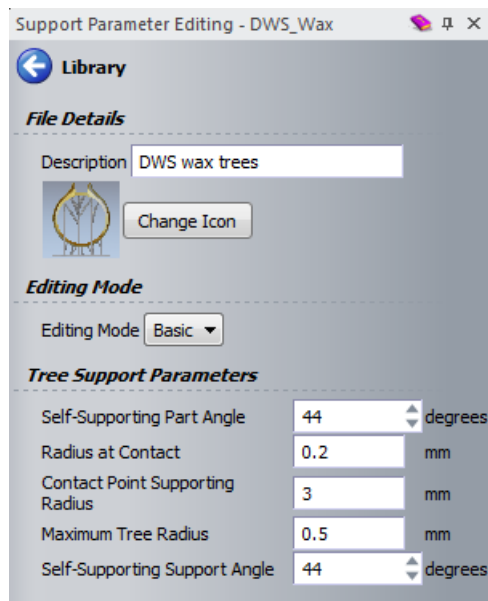



*To rename a support type, right-click it and select **Rename**.*

Editing the parameters of support types

To edit the parameters of the support types:

- 1 In the **3D Printing Job** panel, click **Support Library**  to display the **Support Library** panel.
- 2 In the **Support Library** panel, select the support type that you want to edit. The **Support Parameter Editing** panel is displayed.



- 3 Enter a description for the support type in the **Description** field.
- 4 If you want to change the icon, click **Change Icon**. You can select a [.png](#), [.bmp](#), [.jpg](#), or [.gif](#) file.
- 5 Select an **Editing Mode**. There are two editing modes available: **Basic** and **Advanced**. The settings available for each mode are described in the Reference Help.
- 6 Enter your parameters in the available fields, then click  to return to the library.


Manually positioning and editing contact points

Contact points determine where supports attach to the assembly. They can be generated automatically, or positioned manually. Automatically generated contact points can be edited in the same way as manually positioned contact points. The colour of the contact points is determined by the colour assigned to their **Contact Point Group**.

To manually position contact points, or edit contact points that have been automatically generated:

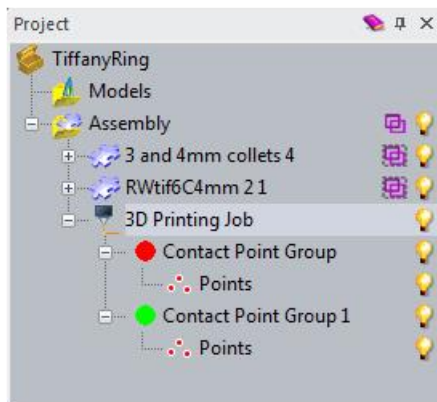
- 1 On the **Contact Point Group** panel, click **Modify Contact Points**



- 2 Click the assembly at the position you want to add a contact point. A contact point is created in the colour assigned to the selected **Contact Point Group**.
- 3 Click a contact point to remove it from the part. If the contact point has a support, either:
 - Delete the support mesh from the the Project Tree; or
 - Click **Generate Supports**  to remove all supports and regenerate them.

Using contact point groups

Contact points are grouped into **Contact Point Groups** in the Project Tree. You can add more than one contact point group to a 3D-printing job. Each **Contact Point Group** you create is assigned a different colour, which makes it easier to see to which groups the contact points on the assembly belong.



To change the colour of the points in a group, click the colour swatch beside a **Contact Point Group** item to display the **Color** dialog and select a new colour.

You can select a different support type for each **Contact Point Group**. For example, if you want to have column supports at the bottom of the model, and tree supports at the top of the model, you can create two contact point groups and select a different support type for each before manually adding your contact points to the model.

In this example, column supports are used to attach the bottom of the model to the base, and tree supports are used to support the top of the model.



Editing the position of generated supports

After you have generated the supports for your assembly, you can delete any that you do not want before exporting the files to the printer.

To delete supports:

- 1 In the **View** window, click the support you want to remove. The corresponding mesh item is highlighted in the Project Tree.

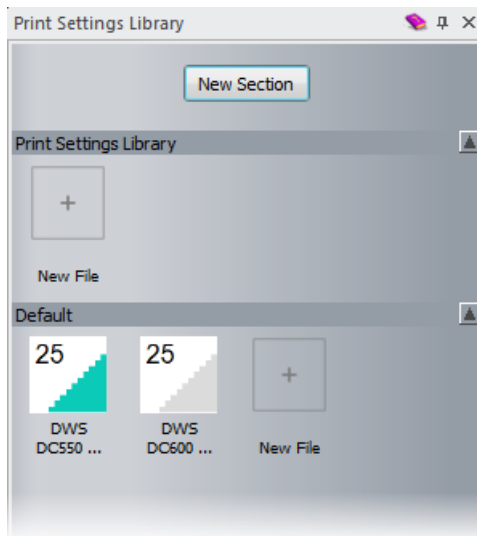


*Ensure the **Contact Point Group** containing that mesh is expanded so you can see which mesh is highlighted.*


- 2 Right-click the highlighted mesh and select **Delete** from the context menu.

Print Settings Library

When using the Ember printer, you must define the print settings to tell the printer how you want to print the relief. Different resins and slice thicknesses need different parameters specified in order to print successfully. Use the **Print Settings Library** panel to select one of the default settings files, or create your own.



To display the **Print Settings Library** panel:

- If you are printing a relief, select **File > 3D Print > Print Settings Library**,
- If you are printing an assembly, click **Print Settings Library** on the **3D Printing Job** panel. 

The following settings are available:

New Section — Click this button to create a new section beneath the existing sections in the panel. The new section contains a blank *New File* icon. To rename the section, right-click its header and select **Rename**.





New File — There is a *New File* button in each section. Click this icon to create a new support type.

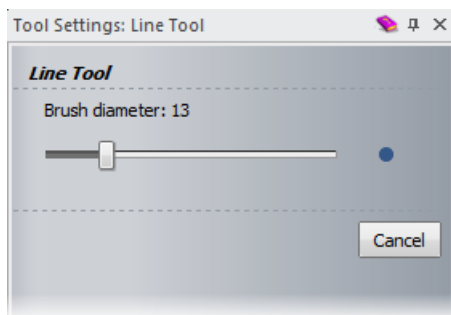


Print Settings icons — Click a print settings icon to display the **Print Settings Editing** panel, where you can edit the parameters of the selected print settings type. For more information about the available parameters, see the Reference Help.

Using the Draw Bitmap Line tool

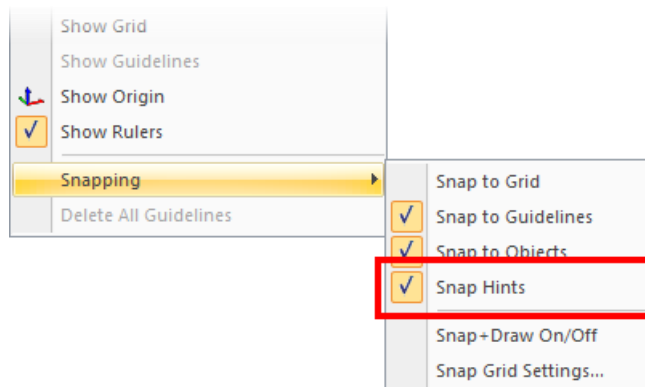
The **Draw Bitmap Line**  tool enables you to draw a bitmap line on the active bitmap layer in the primary or secondary colour. This tool now works in the **3D View** window as well as the **2D View** window. You can control the thickness and shape of the line using the slider on the new **Tool Settings: Line Tool** panel, which is

displayed when you click the  button. Previously you had to use the **Tool Settings: Paint Tool** panel to control the line thickness and brush shape.



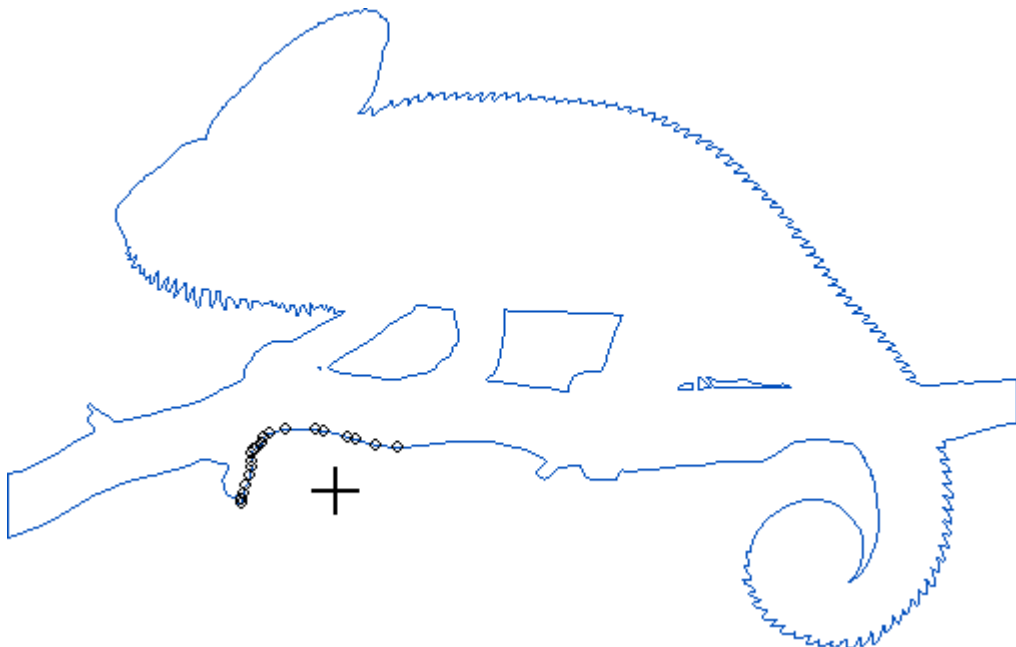
Identifying snap points

There is a new **Snap Hints** option in the **View > Snapping** menu.



When this option is selected, small circles appear at potential snap points as the cursor moves near them, which helps you to locate hard-to-find snap points. Some already visually obvious snap points, such as vector intersections, are omitted. In the event that there are many potential snap points in close proximity to the cursor, their number is limited to the closest 20 snap points.

In the following example, you can see the potential snap points as black circles on the vector artwork above the cursor **+**.

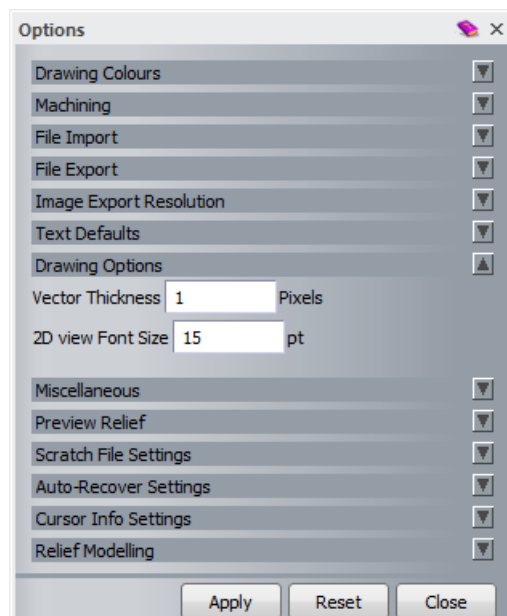


Changing the thickness of vectors

You can now change the thickness of vectors in both the **2D View** and **3D View** windows. Previously it was only possible to change the thickness of vectors in the **3D View** window.

To change the thickness of the vectors in your model:


- 1 Select **Edit > Options** to display the **Options** panel.
- 2 Click **Drawing Options** to expand the area and display the available settings.

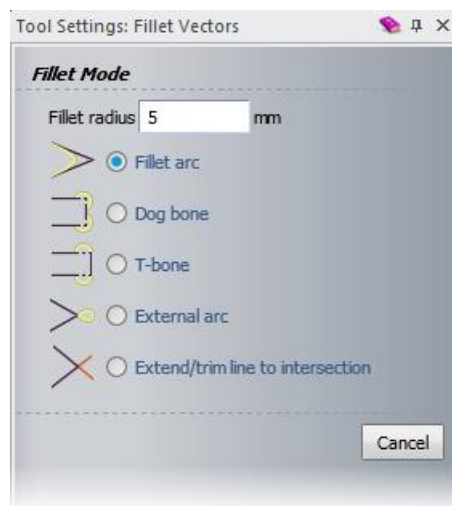


- 3 In the **Vector Thickness** field, enter the width of your vectors in pixels.
- 4 Click **Apply**. The thickness of all vectors in the model is updated the new value.

Creating fillets

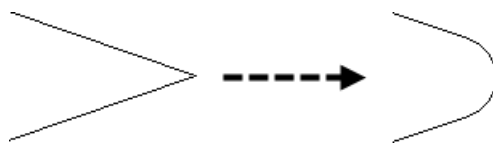
There are new fillet settings available from the **Tool Settings: Fillet Vectors** panel, which give you more flexibility when creating rounded corners, closing vectors, or joining vectors. In addition, the

Fillet Vectors  button is updated to keep it consistent with the icons on the panel.

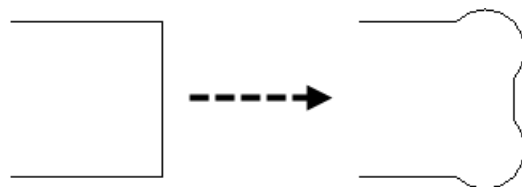


You can now create the following fillets:

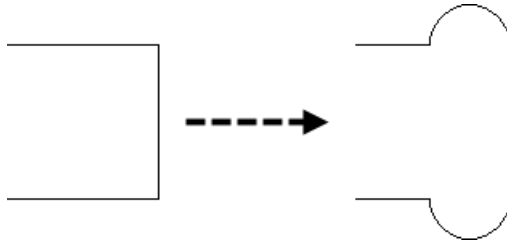
Fillet arc — This option replaces the **Insert Fillet** option. Enter a radius for the fillet in the **Radius Fillet** field, then either click the line spans you want to join with an arc, or click the corner you want to smooth.



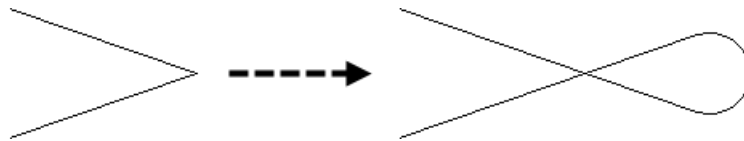
Dog bone — This option enables you to create an arc on corners. This fillet needs two adjacent lines to work. Enter a radius in the **Radius Fillet** field, then click the corner at which you want to insert the arc.



T bone — This option enables you to create an arc to one side of a corner. The fillet needs two adjacent lines to work. Enter a radius in the **Radius Fillet** field, then click the two adjacent line spans you want to join with an arc. The arc is created on the first line span clicked.



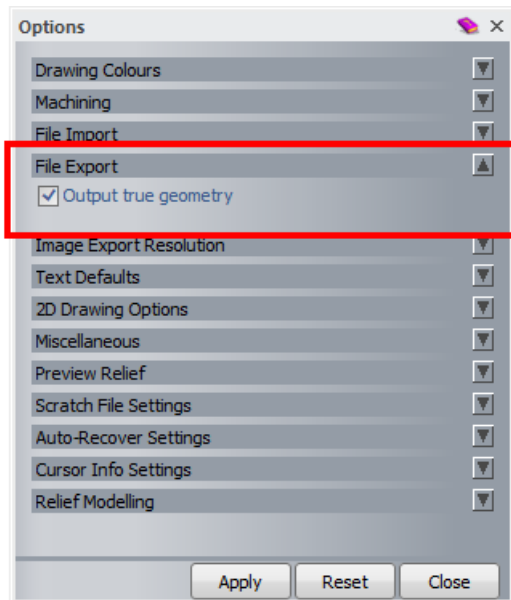
External arc — This option extends adjacent line spans tangentially and then loops back round. You could use this fillet for smooth rather than abrupt changes in direction.



Extend/trim line to intersection — This option is unchanged in ArtCAM 2015 R2.

Exporting true circles

There is a new **Output true geometry** setting on the **Options** panel. If selected, when you export circles to a **.dgn** or **.dxf** file, you export them as their true shape instead of as arcs or Bézier curves. This can lead to better machining results because some machines use circle data when machining.



Merging vector layers

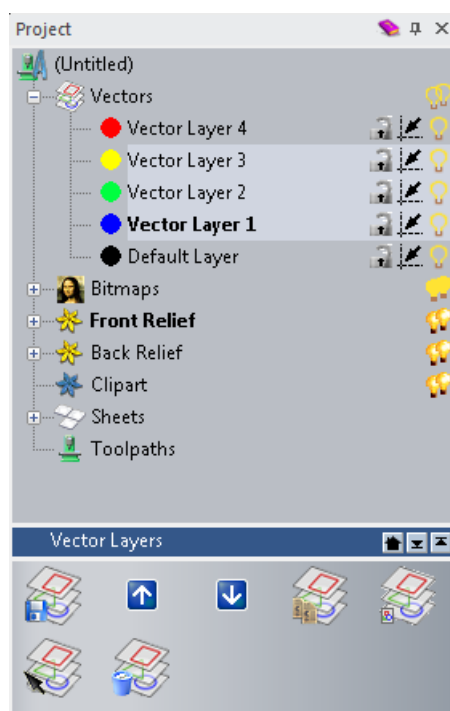
You can now merge multiple vector layers when they are selected in the Project Tree. Previously, you could only merge vector layers that were visible.




*If you are working in ArtCAM Express, vector layers are available only with the **Vector Tools** module.*

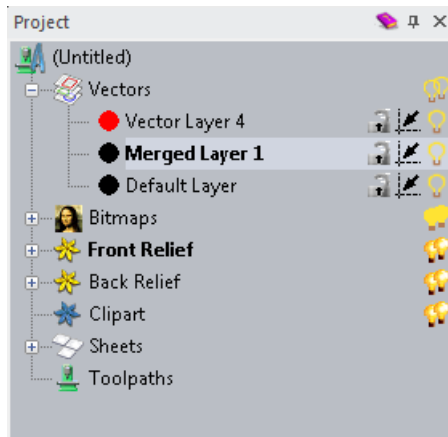
To merge selected vector layers:

- 1 In the Project Tree, select the vector layers that you want to merge. The **Vector Layers** panel is displayed below the splitter bar.



*Press and hold down the **Shift** key to select multiple layers.*

- 2 Click **Merge Vector Layers** . The selected layers are combined into one new layer called **Merged Layer 1**.





Importing and exporting vectors


There are new import options available when working with vector layers.

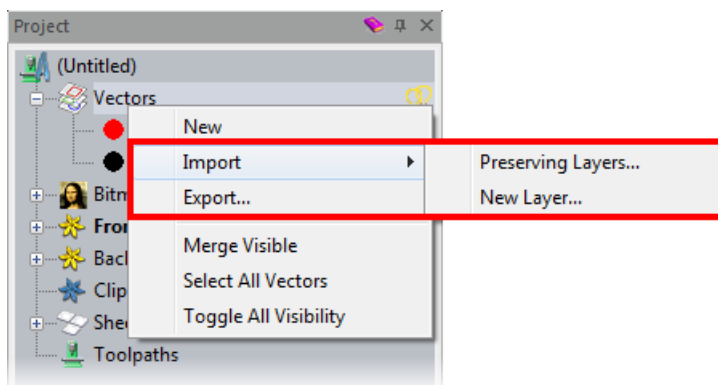


*If you are working in ArtCAM Express, vector layers are available only with the **Vector Tools** module.*


On the **Vector Layers** panel, the **Import Vectors** button is replaced by the following buttons:



-  **Import Vectors Preserving Layers** — This is the same as selecting **Vectors > Import** on the **Main** menu bar. If layers are detected in the file, a new vector layer is created for each layer.
-  **Import Vectors Into New Layer** — This is the same as selecting **Vectors > Load Layer** on the **Main** menu bar. Click to import all vectors in the file into a single new layer regardless of how many layers are in the file.

There is a new **Export** option on the **Vectors**  item context menu, which is the same as selecting **Vectors > Export** on the **Main** menu bar and enables you to export all vectors in the model. The context menu also contains the two new import options: **Import Preserving Layers** and **Import Vectors Into New Layer**.

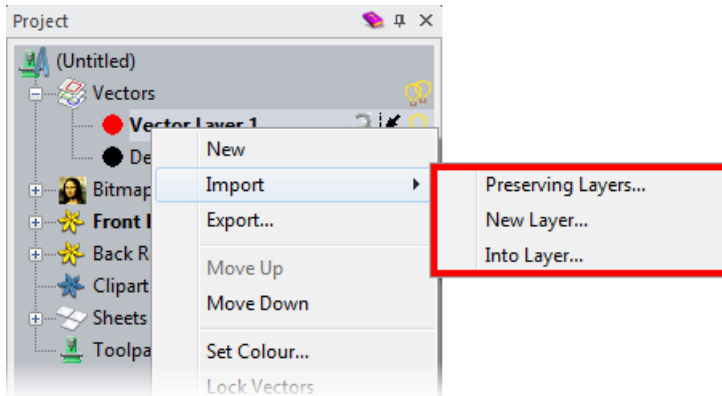



On the panel that is displayed when you select a vector layer in the Project Tree, the **Import Vectors** button is replaced by the following buttons:

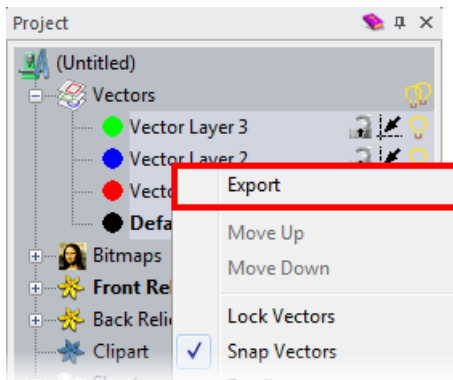
-  **Import Vectors Preserving Layers** — This is the same as selecting **Vectors > Import** on the **Main** menu bar. If layers are detected in the file, a new vector layer is created for each layer.

- 
Import Vectors Into New Layers — This is the same as selecting **Vectors > Load Layer** on the **Main** menu bar. Click to import all vectors in the file into a single new layer regardless of how many layers are in the file.
- 
Import Vectors Into Layer — Click to import vectors into the currently selected layer.

These options are also included in the vector layer's context menu.

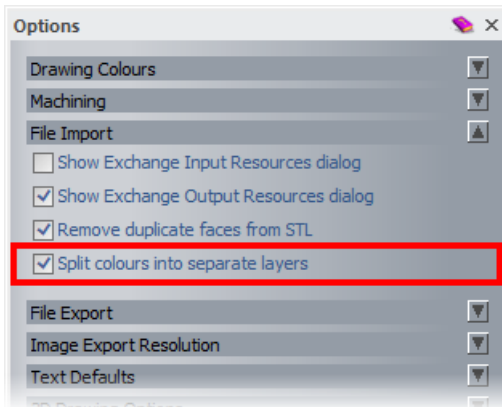


When you have multiple vector layers selected, a new **Export**  button is available on the **Vector Layers** panel. Click to export all selected vector layers to one file. This option is also available from the context menu.




Preserving vector colour information

There is a new **Split colours into separate layers** option on the **Options** panel, which enables you to choose whether or not differently coloured vectors are imported onto different vector layers.

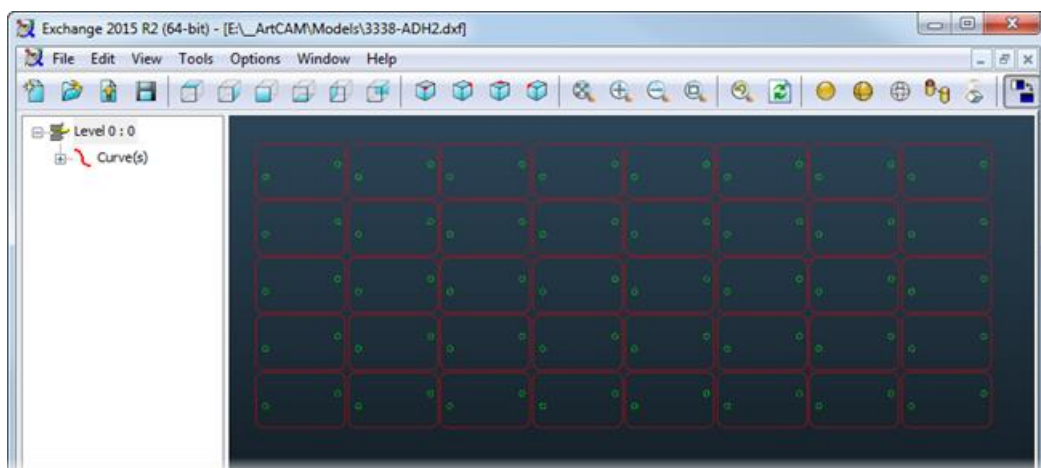



*If you are working in ArtCAM Express, vector layers are available only with the **Vector Tools** module.*

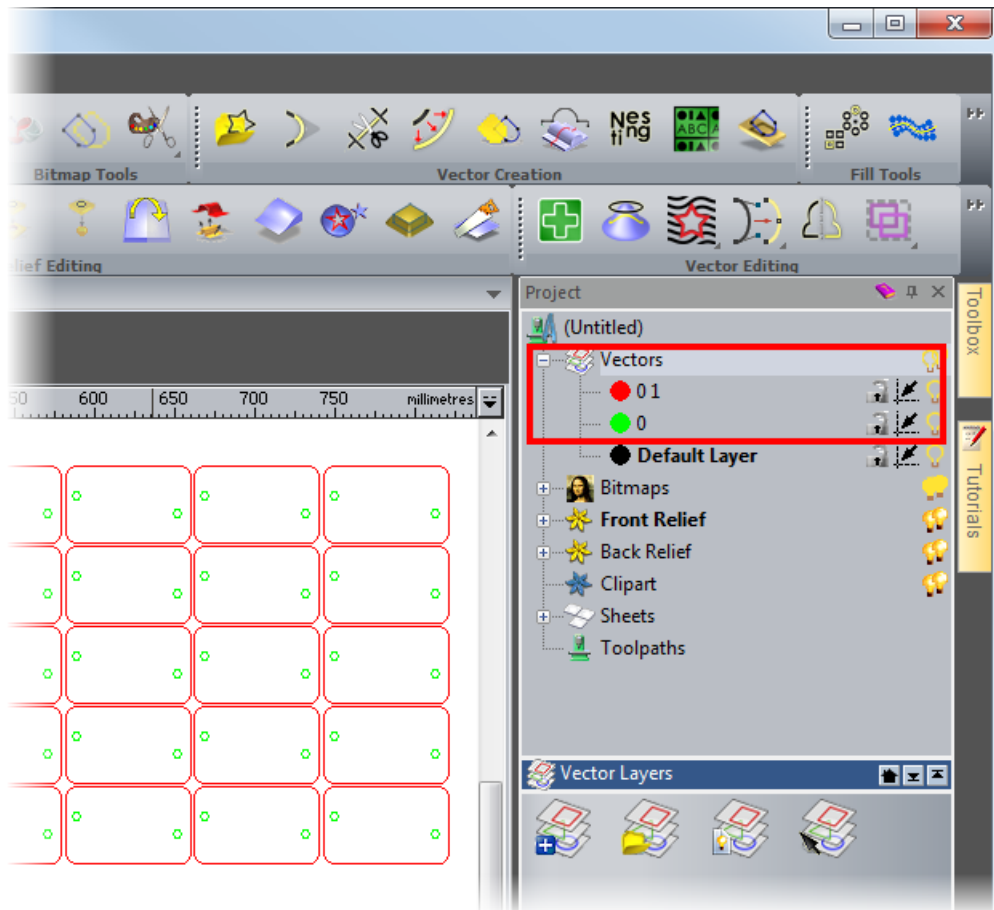
If **Split colours into separate layers** is selected, when you use **Import**

Preserving Vector Layers (see page 48)  to import a **.dxf** file that contains different coloured vectors, the coloured vectors are imported into separate layers so that you do not lose the colour information. If **Split colours into separate layers** is deselected, colour information is lost if there are layers containing vectors with different colours. This option is deselected by default.

For example, this **.dxf** file, as viewed in Delcam Exchange, contains a single layer with multiple colours:

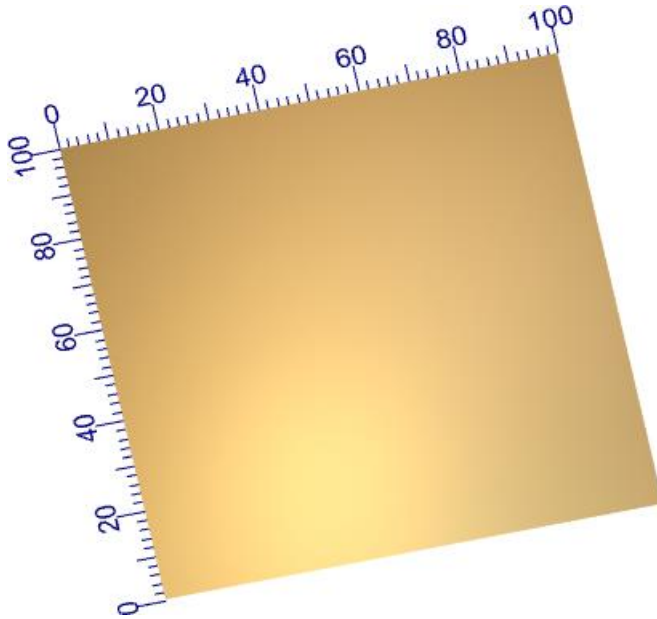


If you import it into ArtCAM using **Import Preserving Vector Layers** (see page 48) , the colours are preserved and imported into two separate layers:



Using rulers in the 3D View window

Rulers are now displayed by default in the **3D View** window. The rulers are attached to the top and left edge of the model area, and move with the model as you rotate and reposition it.



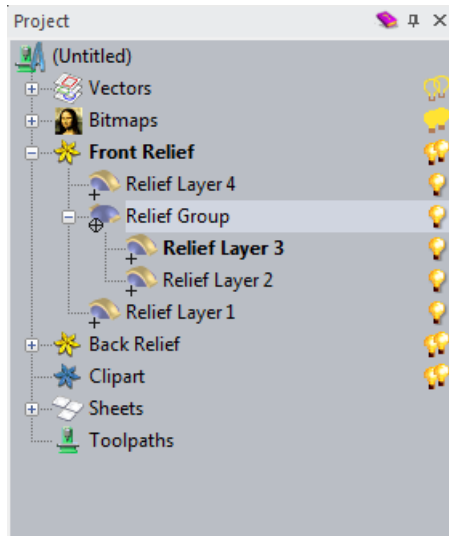
Rulers are displayed by default. If you want to hide the rulers, deselect **View > Show Rulers**. This hides the rulers in both the **2D View** window and the **3D View** window.

To change the colour of the ruler in the **3D View** window:


- 1 Select **Edit > Options** to display the **Options** panel.
- 2 Expand the **Drawing Colours** section.
- 3 In the **3D Drawing Colours** area, click the **Rulers** colour swatch to display the **Color** dialog.
- 4 Select a new colour and click **OK**.
- 5 On the **Options** panel, click **Apply**.

Creating relief layer groups


In ArtCAM Pro and ArtCAM Jewelsmith, you can now create relief groups in the **Front Relief** and **Back Relief** layer stacks. Relief groups can contain multiple relief layers and other relief groups.



Relief groups give you much more control over how relief layers combine with the composite relief. You can use each item's combine mode to control how the layers within relief groups combine with each other, then control how the relief group as a whole combines with the **Relief Layer** stack by changing its combine mode and its position in the stack.


To create a relief group, click the **New Relief Layer Group**  button, either on the **Relief Layers** panel or on a selected layer's panel. The new relief group is created above the previously active relief layer in the layer stack. You can drag it to change its position in the layer stack or drop it into another relief group.

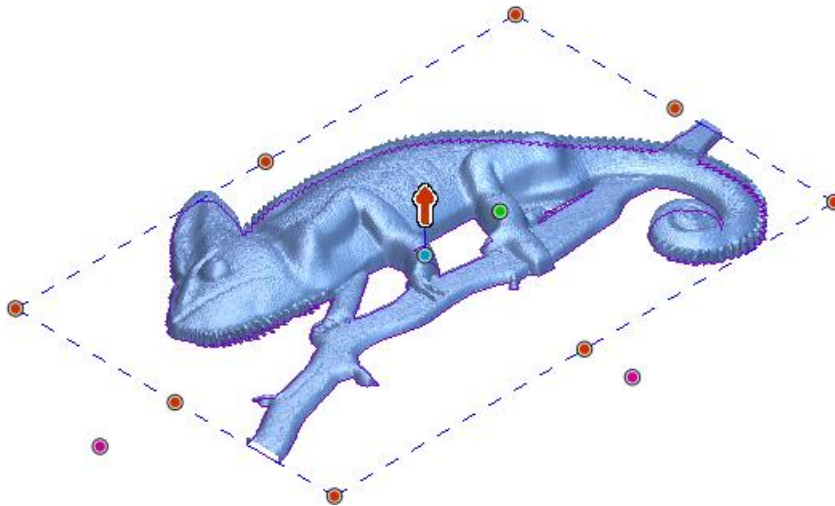
To add relief layers to a relief group, select the relief group in the

Project Tree, and click **New Relief Layer**  in the relief group's panel. The new relief layer is added above the active layer. Alternatively, you can drag and drop existing layers onto relief groups to add them.

Interactively editing the Z height of relief clipart

When you are using the **Transform** tool and your selection includes

relief clipart, a control arrow  pointing in the Z direction is displayed. Click and drag this arrow to resize all selected relief clipart in the Z direction. This tool enables you to interactively blend heights with another relief or relief clipart.

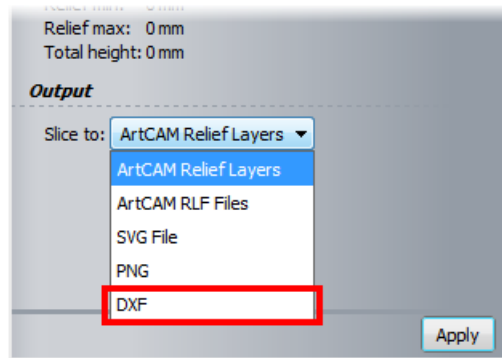


Exporting relief slices to .dxf

In ArtCAM Insignia, ArtCAM Pro, and ArtCAM Jewelsmith, the **Slice**

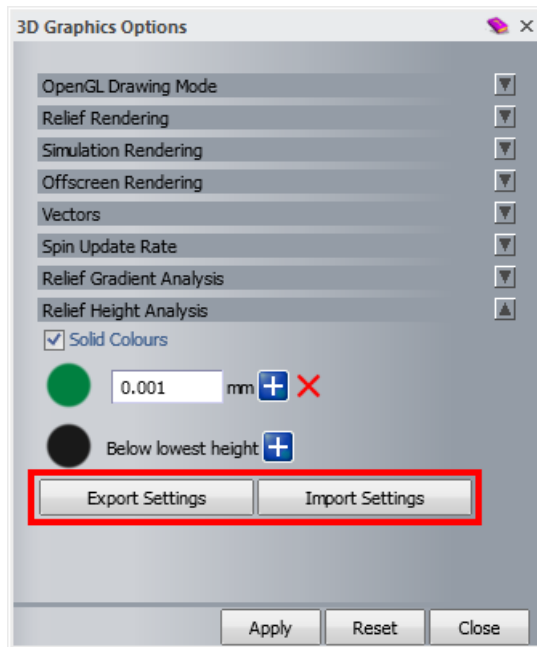


Relief tool enables you to divide the composite relief or the content of a single relief layer into slices. When you use the **Slice Relief** tool, you can now export relief slices to **.dxf** files, which can be useful for creating outlines for Laser Machining.



Sharing your Relief Height Analysis settings

In ArtCAM Pro and ArtCAM Jewelsmith, there are new **Export Settings** and **Import Settings** buttons available in the **Relief Height Analysis** area of the **3D Graphics Options** panel. These buttons enable you to share your relief height analysis settings between workstations, meaning you only need to set up your colours and heights once.

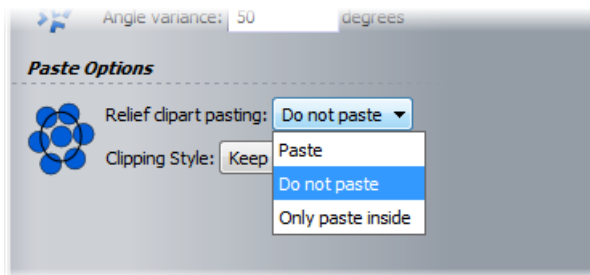


Using the Texture Flow tool



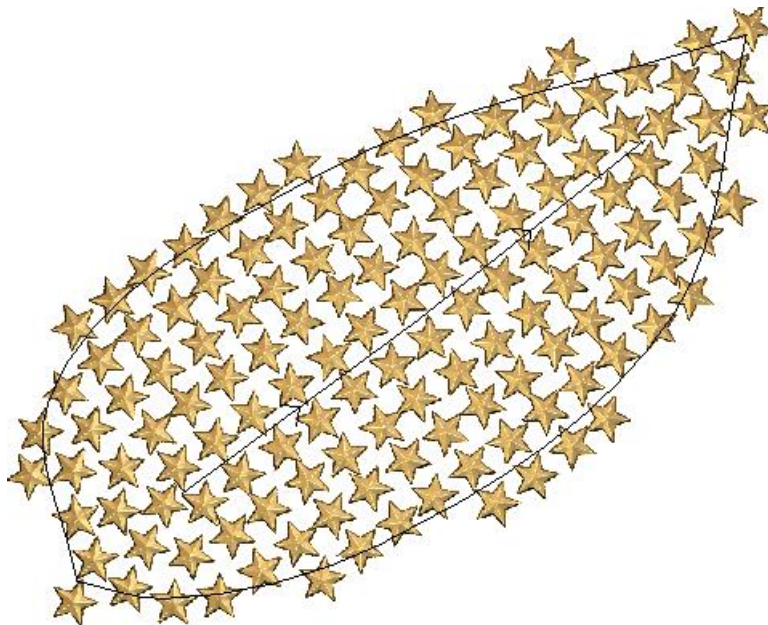
The **Texture Flow** tool enables you to paste consecutive copies of relief clipart on a path within a boundary. In ArtCAM Pro and ArtCAM Jewelsmith 2015 R2, you can choose to keep the generated texture relief clipart as relief clipart rather than pasting it directly onto the active relief layer.

The **Paste Options** area replaces the **Boundary Options** area, and contains the new **Relief clipart pasting** options:



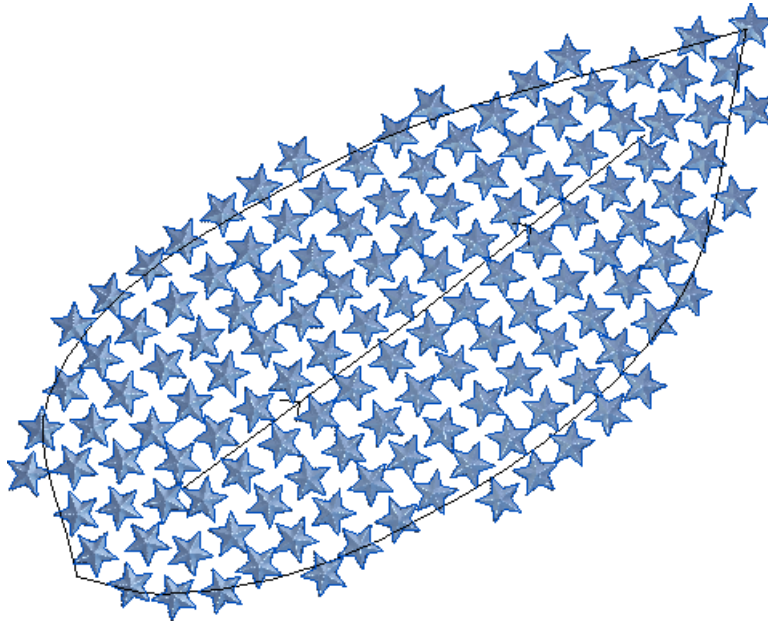
Paste — The relief clipart is pasted onto the active relief layer. You can choose any of the **Clipping Style** options. This matches the previous behaviour of the tool.

In this example, *Paste* is selected with the *Keep Clipping Style*:



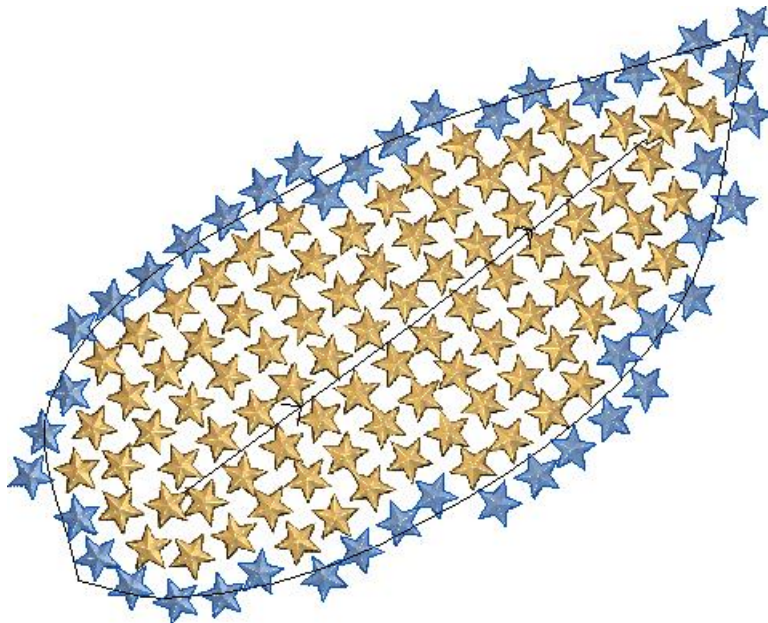
Do not paste — The relief clipart is kept as individual pieces of relief clipart. You can select a *Keep* or *Delete Clipping Style*.

In this example, *Do not paste* is selected with the **Keep Clipping Style**:



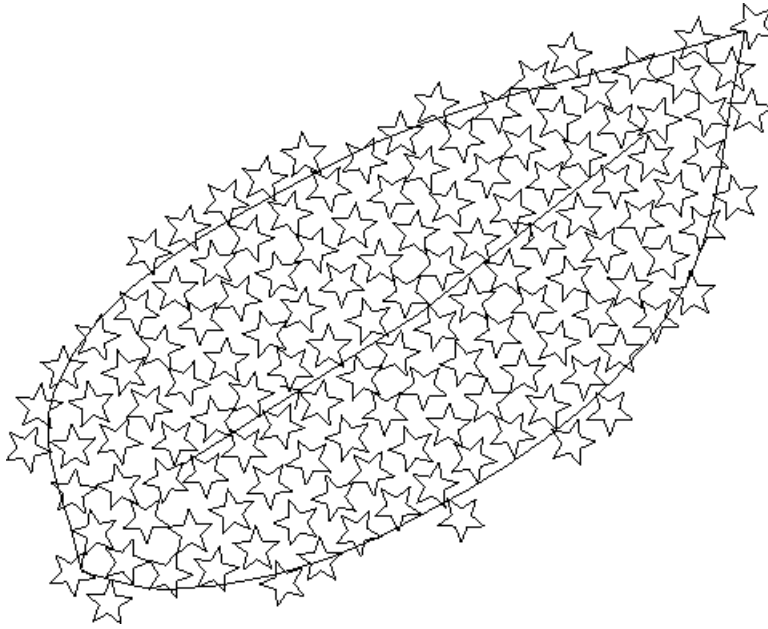
Only paste inside — Any pieces of relief clipart that lay inside the boundary are pasted onto the relief layer. Relief clipart that intersects the boundary is kept as relief clipart.

In this example, *Only paste inside* is selected:






If you have a vector or group of vectors selected with **Set Object**, the **Relief clipart pasting** options are unavailable. You can choose any of the **Clipping Style** options. This matches the previous behaviour of the tool.

In this example, the *Keep Clipping Style* is selected:



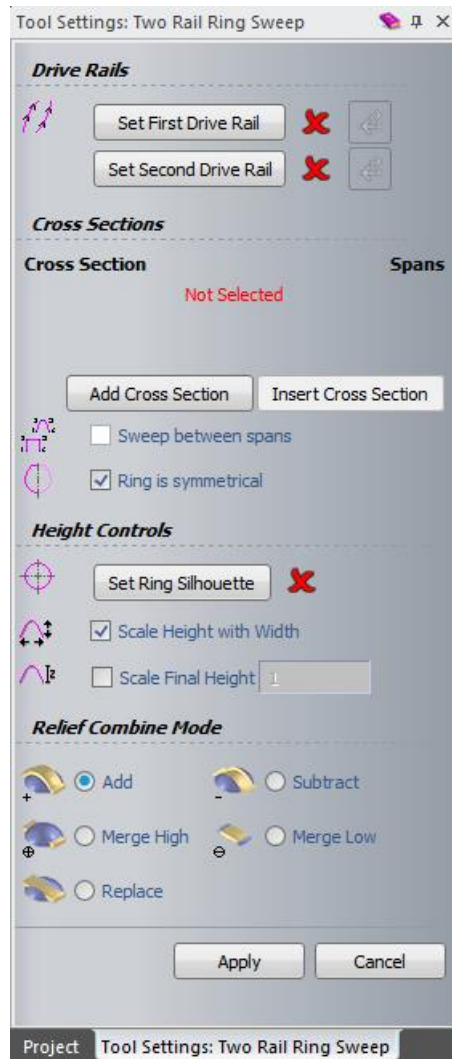
Live tools

Three tools now work in real-time, meaning you see instant results when you manipulate the vectors.

-  **Two Rail Ring Sweep (see page 61)**
-  **Weave (see page 63)**
-  **Contour Blend (see page 66)**

Live Two Rail Ring Sweep tool

When you use the **Two Rail Ring Sweep** tool in ArtCAM Jewelsmith, the relief updates in real-time so you can instantly see the results of any adjustments you make to the vectors.

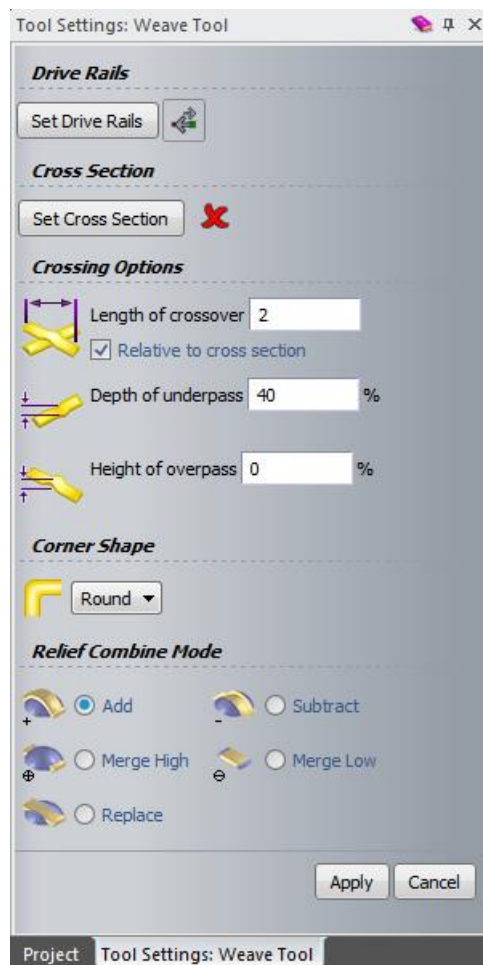


In addition, there are the following changes to the panel:

- The panel is redesigned so it is consistent with the **Two Rail Sweep** panel.
- When you display the panel, it is now docked on the right hand side of the **View** window.
- The **Set Ring Silhouette** option replaces the **Ring Silhouette** option, and is located in the **Height Controls** area of the panel.
- The **Silhouette Vector Controls Z** option is removed. If a ring silhouette is selected, it is implied that this vector controls the Z height.


Live Weave tool

In ArtCAM Insignia, ArtCAM Pro, and ArtCAM Jewelsmith, the **Tool Settings: Weave Tool** panel replaces the **Weave Wizard** dialog. This tool now works in real-time so you can instantly see results when you manipulate the drive rail or cross-section vectors.

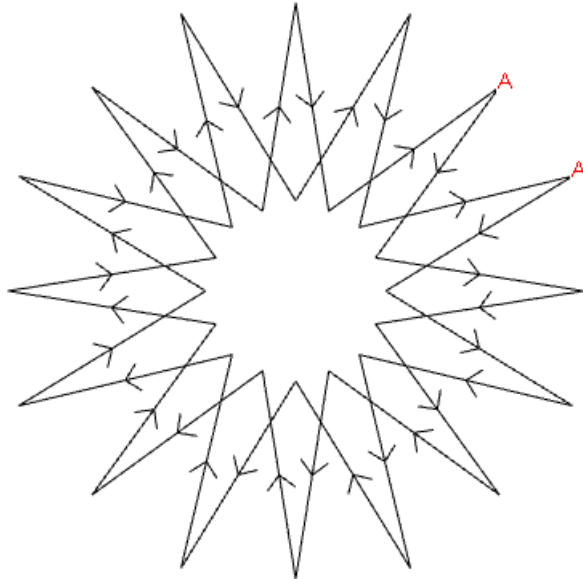


There are two new buttons, **Set Drive Rails** and **Set Cross Section**, which give you greater flexibility when selecting vectors because you can now select vectors after opening the tool. Previously, you had to select your vectors before opening the tool, and the order in which they were selected determined whether a vector was a drive rail or a cross-section.

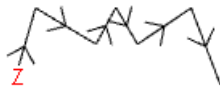
To create a weave relief:

- 1 Display the **3D View** window.
- 2 In the **Relief Creation** toolbar, click **Weave** . The **Tool Settings: Weave Tool** panel is displayed.

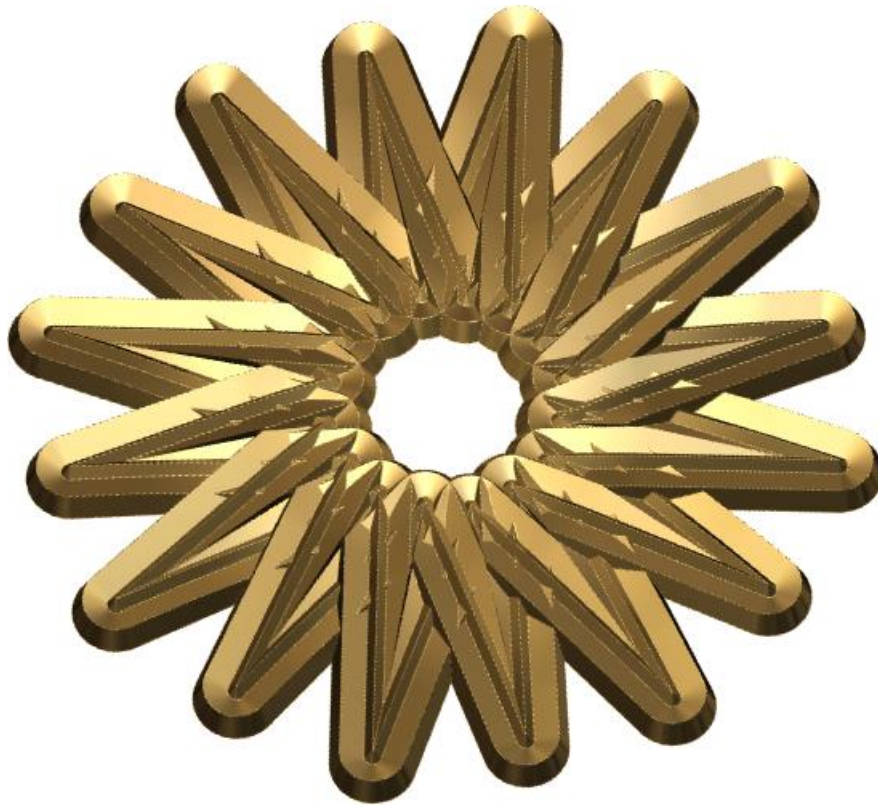
- 3 Select the vectors you want to use as drive rails then click **Set Drive Rails**. An **A** is displayed beside the start point of all drive rails, and arrows indicate the direction of the vectors.



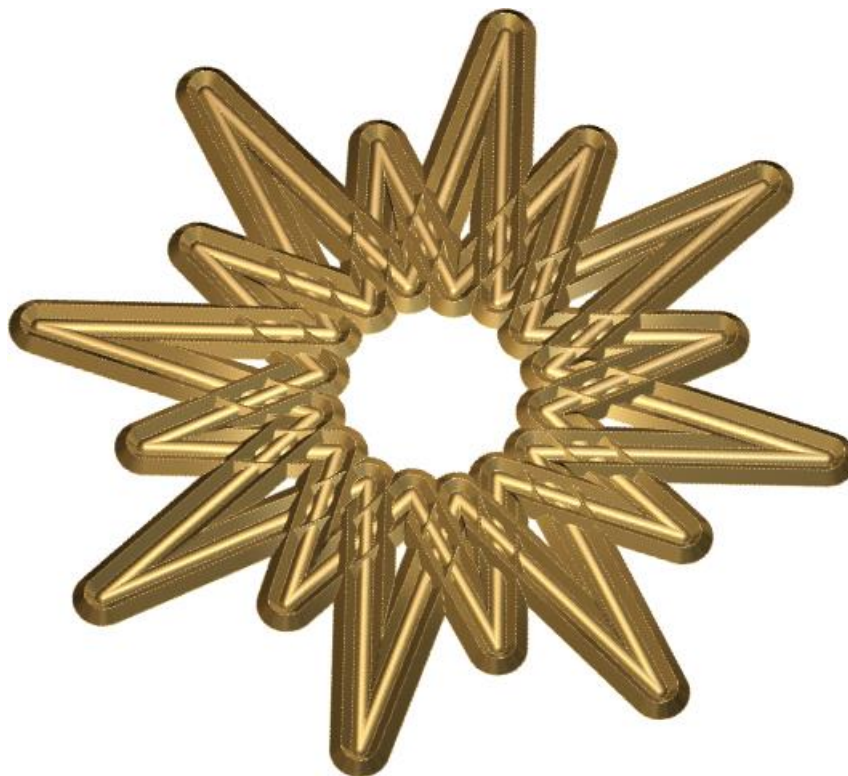
- 4 Select the vector you want to use as the cross-section then click **Set Cross Section**. A **Z** is displayed beside the start point of the cross-section vector.



A preview of the relief is displayed in the **3D View** window.



- 5 In the **3D View** window, select a vector and edit the nodes to change the shape of the weave. The relief preview updates instantly as you make your changes.



- 6 Edit the parameters in the **Crossing Options** area of the panel to control how the crossovers are displayed.
- 7 In the **Relief Combine Mode** area, choose how the relief combines with the active relief layer.
- 8 When you have finished making adjustments to the appearance of the weave, click **Apply**.

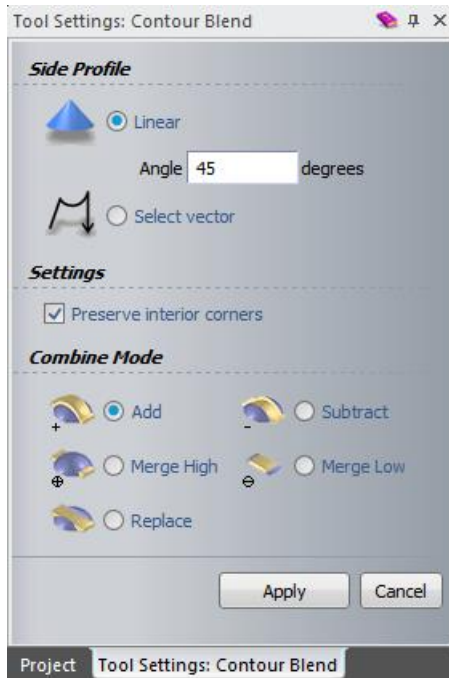


*If you close the panel without clicking **Apply**, or click **Cancel**, the relief is reset. However, any changes you made to the vectors are retained.*

Live Contour Blend tool



When you use the **Contour Blend** tool in ArtCAM Pro and ArtCAM Jewelsmith, the relief is updated in real-time so you can instantly see the results of any adjustments you make to the vectors. In addition, the **Contour Blend** panel is now a *Tool Settings* panel, so is docked on the right-hand side of the **View** window when it is displayed.




Creating constant height letters

In ArtCAM Insignia, ArtCAM Pro, and ArtCAM Jewelsmith, you can now use the **Shape Editor** to create constant height letters. The **Constant Height Letters** button is removed from the **Relief Creation** toolbar, and a **Corner Angle** field is added to the **Shape Editor** panel.



To create constant height letters with the **Shape Editor**:

- 1 Select the vector text from which you want to create the reliefs.
- 2 In the **Relief Creation** toolbar, click **Shape Editor**  to display the **Shape Editor** panel.
- 3 Select a **Round** or **Square** profile.
- 4 Select **Constant height**.
- 5 In the **Height** field, enter the height of the profile. This is the equivalent of the **Top Height** field in the old workflow.
- 6 In the **Corner Angle** field, enter the radius of the corners in the lettering. This enables you to taper all areas of the constant height relief that are of a smaller radius than that specified.
- 7 In the **Start Height** field, enter a height for the base of the letters. This is equivalent to the **Bottom Height** field in the old workflow.
- 8 Click **Apply** to create the relief.

Searching the libraries

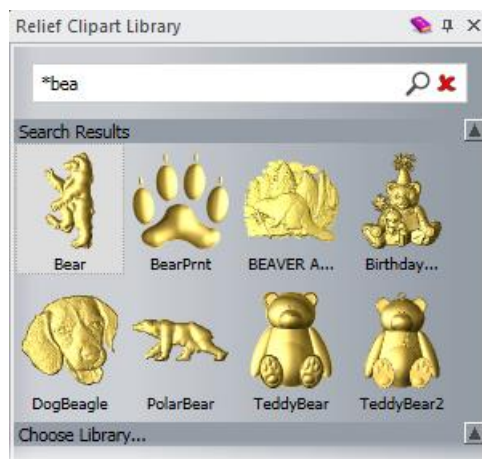
There is new search field in the **Vector Library**, **Relief Clipart Library**, and **Component Library** panels, which enables you to quickly find files saved in the library you are searching in. When you enter a search term in the field, the top results appear while you type.



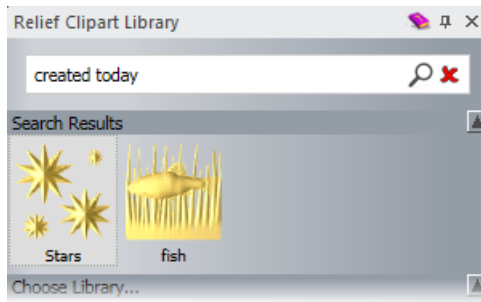
*The **Component Library** is available only with ArtCAM Jewelsmith.*



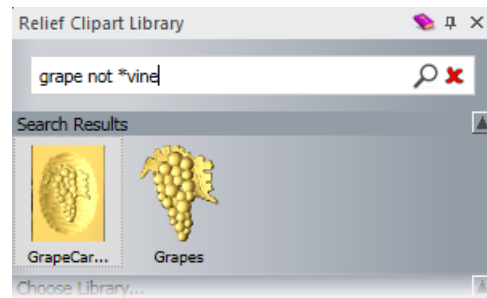
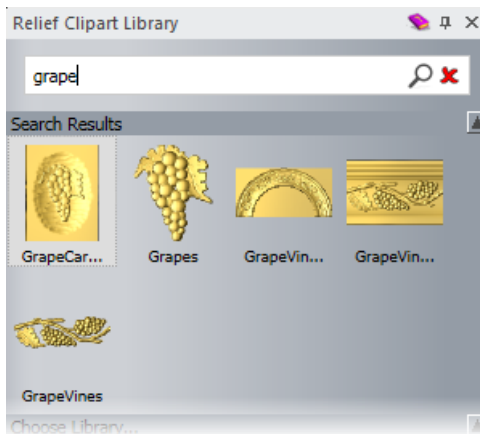
You can use the wild card * character to search within a word. For example, typing ***bea** in the **Relief Clipart Library** search field returns any relief clipart with *bea* in its name.



To search for all clipart created on the day you're searching, enter **created today** in the search field.



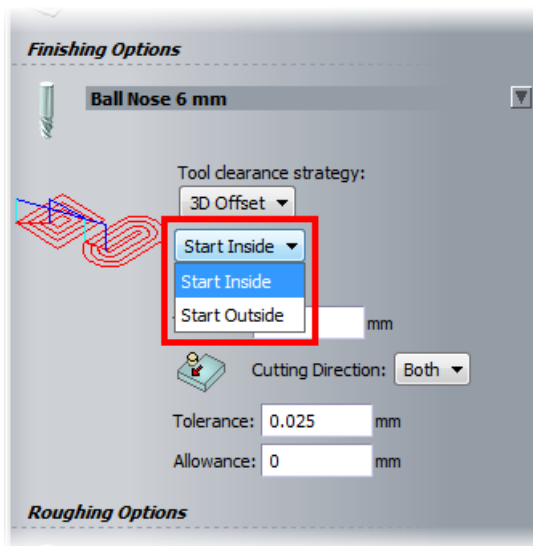
To exclude items from the search, enter **not *** in the search field in front of the term you want to exclude. For example, to search for all grape clipart, but exclude any whose name mentions vines, enter **grape not *vine**.



Controlling the direction of the offset in 3D Offset strategies

In ArtCAM Pro and ArtCAM Jewelsmith, when creating a **3D Offset** or **3D Offset Spiral** Machine Relief toolpath, you can now choose whether to start offsetting from the inside or the outside of the clearance area. Previously these strategies only allowed you to start offsetting from the outside.

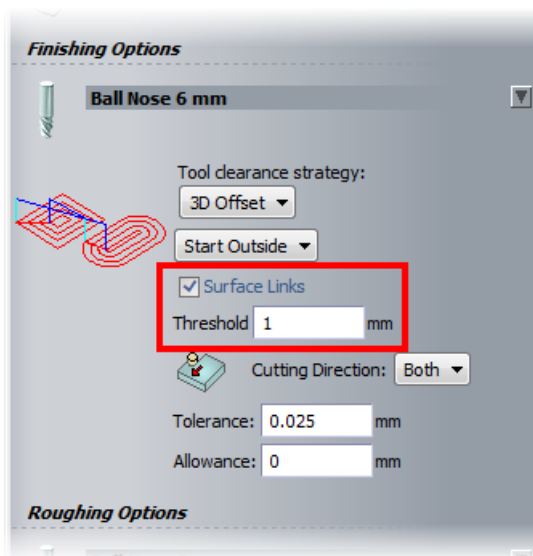
For some customers, the **Start Inside** option can improve machining by reducing damage to the tool and to delicate materials (such as jewellery wax).



Setting a threshold for surface links in 3D Offset and Constant Z strategies

In ArtCAM Pro and ArtCAM Jewelsmith, there is a new **Surface Links** option when you are creating **3DOffset**, **3DOffset Spiral**, or **Constant-Z** finishing strategies. When **Surface Links** is selected, you can set a **Threshold** for surface links. If a link length is above the threshold, the toolpath safely retracts to Safe-Z; but if the link length is below the threshold, the tool link moves across the model surface to the next offset or slice.

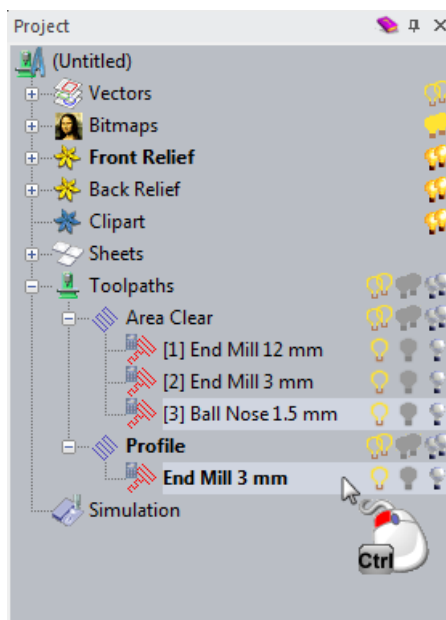
Surface link moves can significantly speed up some toolpaths by reducing the slow Z-axis retract and plunge moves. However this option must be used with care. Long surface link moves can go outside a machining boundary, but will still follow the model Z profile. So you must ensure that adequate material is removed by roughing.



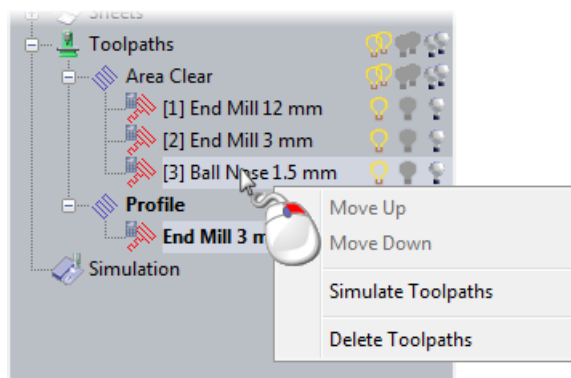
Selecting multiple toolpaths

You can now select multiple toolpaths from different parent groups and simulate or delete them. For example, if you have an *Area Clearance* toolpath containing three toolpaths, and a *Profile* toolpath, you can now select one of the *Area Clearance* toolpaths and the *Profile* toolpath, and then simulate them together. Previously, multiple selection was restricted to toolpaths within the same parent group.

To select toolpaths from different parent groups, press and hold down the **Ctrl** key, then use the cursor to select from the Project Tree the toolpaths you want to simulate.




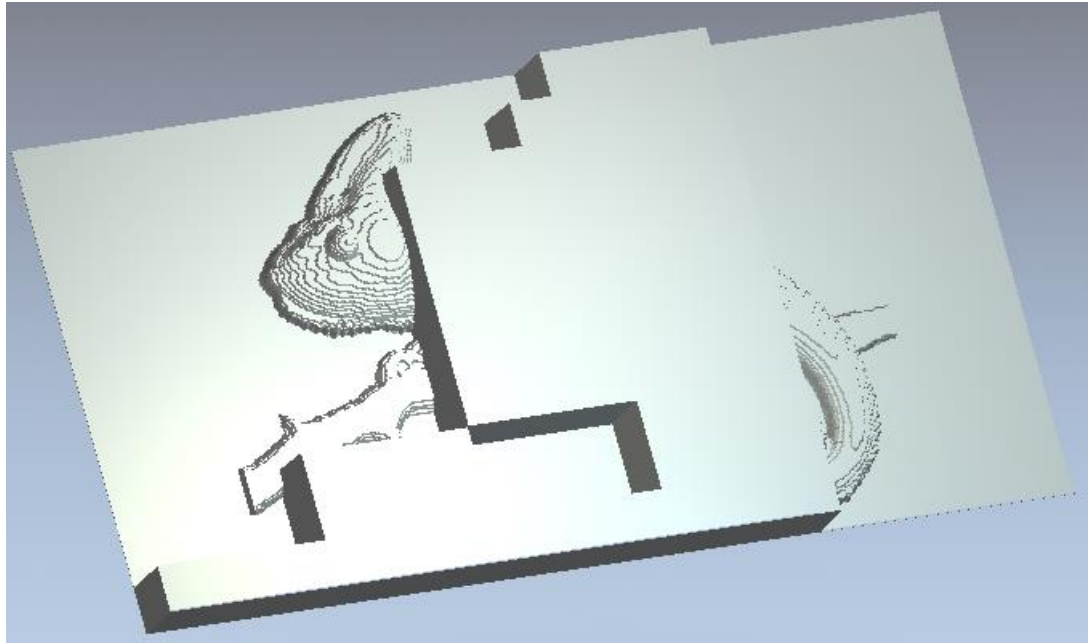
Right-click a toolpath in your selection to display the context menu. This menu enables you to simulate or delete the selected toolpaths.




Simulating toolpaths

In ArtCAM 2015 R2, toolpath simulation is much faster when you

use the **Simulate Toolpath**  button, or select **Simulate Toolpath** or **Simulate All Toolpaths** from a context menu. Now, when you simulate toolpaths, ArtCAM splits the model up into blocks, and these multiple blocks are machined in parallel by the GPU/CPU. This means the simulation process looks different when you watch it.



If you want to play through the simulation more slowly and view the wireframe tool moving across the model, click the **Simulation Control**



Bar  button on the panel of the toolpath you want to simulate to display the **Simulation Control** toolbar.



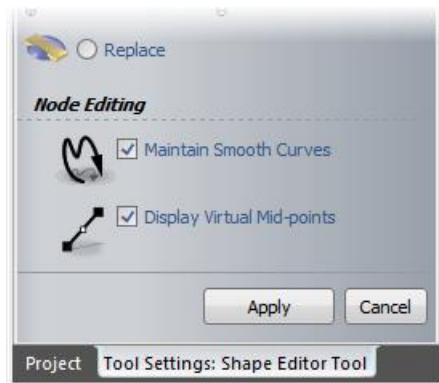
For more information about the options on this toolbar, see the Reference Help.


Miscellaneous changes

There are the following changes to ArtCAM which are not covered in previous topics:

- The **Tutorials** tab supersedes the **Live!** tab so that all the latest tutorials and videos are available from one location.
- The classic mode Toolpath and Layers panels are removed. All functionality is covered by the **Project** panel, which is where development is focused.
- The **ArtCAM Advantage** option is removed from the **Help** menu. The same function is performed by the **Help > Check for ArtCAM Updates > Software Updates** option.
- If you delete a toolpath from the Project Tree, you can now click **Undo**  or press **Ctrl+Z** to restore the deleted toolpath.
- The **Erase Bitmap**  tool now works in the **3D View** window as well as the **2D View** window.
- In the **Options** panel:
 - The **2D Drawing Options** area is renamed to **Drawing Options**.
 - The **Align Nodes - replace with single line** option is now in the **Miscellaneous** area.
 - The **Vector Thickness** field is added to the **Drawing Options** area. Previously this option was located on the **3D Graphics Options** panel.
 - There is a new **Open on double-click** option under the **Relief Modelling** area of the **Options** panel, which is selected by default. When selected, the **Shape Editor** panel is displayed when you double-click a vector. Deselect this option to disable this behaviour.
 - There is a new **Use GPU for selection** option under the **Offscreen Rendering** area of the **Options** panel, which is selected by default. If antialiasing is forced on in the graphics driver, this causes an incompatibility with this option which can adversely affect the selection of nodes or relief clipart in the **3D View** window. If this happens, deselect this option or turn off antialiasing.

- The options from the **Tool Settings: Node Editing** panel are now also available from the bottom of the **Tool Settings: Shape Editor Tool** panel, so it is easier to edit nodes when working with the **Shape Editor**.



- The **Sweep Profile**  tool is removed from the **Rotary Relief Tools** toolbar in ArtCAM Jewelsmith because you can create simple swept profiles using the **Two Rail Ring Sweep**  tool.

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