Autodesk Alias 2015

What's New

March 2014

AUTODESK

Contents

What's New in Alias 2015

1

We are pleased to provide you with the latest version of Autodesk® Alias™ software. This guide leads you through the new and changed features of Alias 2015.

General improvements

2

Describes general changes and new features.

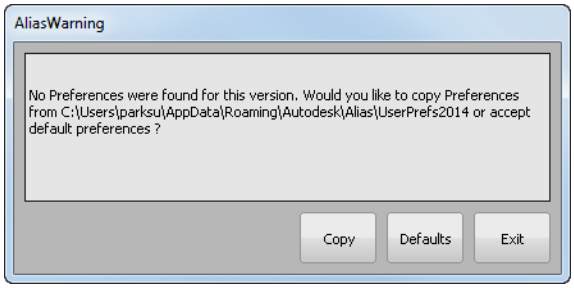
General disclaimer

If you are using existing user preferences from an older version of Alias, you may not notice when the default values of options change.

User preferences for Windows 7 and 8 are located in *C:\Users\<username>\AppData\Roaming\Autodesk\Alias\UserPrefs2015*.

User preferences for Mac OS are located in */Users/<username>/Library/Preferences/Autodesk/Alias/UserPrefs2015*.

If the folder does not exist, it is created the first time Alias 2015 launches. The following dialog appears:



Choose **Defaults** to accept the new default preferences.

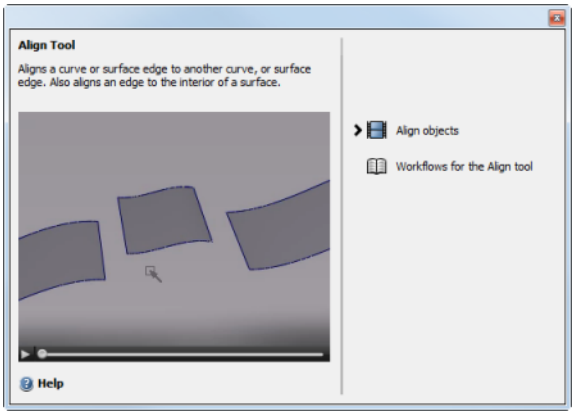
Spaceball support on Mac OS X

Alias now supports the use of a spaceball on Mac OS X.

ToolClips

Learn about tools in Alias using ToolClips. ToolClips provide rapid access to learning content from within Alias via short video clips and Help links.

To view a ToolClip, hover over any tool in the Alias palette, Diagnostic Shade window, or shelves. Click **More** to open the ToolClip window.



To disable ToolClips, choose **Preferences > General Preferences > Help** and select either **Tool Tips** to display only the tool name, or **None** to display nothing when you hover over a tool.

You can customize ToolClips to include additional movies, images or linked content.

Customize ToolClips

ToolClips indicate the name and purpose of a tool and provide access to additional learning content. You can customize ToolClips to include additional movies, images, or linked content.

To edit an existing ToolClip

1. Copy the `ToolClips.xml` file from the `builtin.toolclips\Control` directory to your `custom.toolclips\Control` directory. See *ToolClip directories*, next.

   You must copy the XML file to the `custom.toolclips` directory, because any edits you make in the `builtin.toolclips` directory will be overwritten by software patches and upgrades.
2. In a text or XML editor of your choice, open the copied `ToolClips.xml` file.

NOTE If you plan on adding characters with double-byte encoding, it is recommended that you use an editor that supports UTF-8 formatting. Ensure that the file is saved with this encoding specified.

3 Edit the file to customize the existing ToolClip. See *Parts of the ToolClip XML file*.

For example, you can edit videos, images, and links to point to your custom content.

TIP Each ToolClip is defined using `<toolclip>` elements. Remove any `<toolclip>` elements that yo udo not want to modify so that original ToolClip data is used.

4 Save the XML file.

5 Add any new resources you specified in your XML file to the `custom.toolclips\Resources` directory.

6 Set the location of the custom ToolClips in the **Shared Tool Clips location** box in **Preferences > General Preferences > Help**.

7 Launch Alias to view your ToolClip.

ToolClip directories

By default, ToolClips shipped with Alias are located in the `builtin.toolclips` directory. Any custom ToolClip content must be added to a `custom.toolclips` directory.

builtin.toolclips

The `builtin.toolclips` directory is located as follows:

- Windows

  `\Program Files\Autodesk\Alias2015\ToolClips\builtin.toolclips`

- Mac OS X

  `/Applications/Autodesk/Alias2015/Alias.app/Contents/ToolClips/builtin.toolclips`

The following sub-directories contain the ToolClip content that is shipped with Alias:

- `Control` – Contains the default `ToolClips.xml` file. This file specifies the content that appears in the ToolClip window including tool titles, tool summaries, keyboard shortcuts, movies, images, and help links.
- `Resources` – Contains the movie and image files specified in the `ToolClips.xml` file. Movies must be in WebM format and images must be in PNG or JPEG format.
- `ui` – Contains resources that are used in the ToolClip window including icons. This subdirectory also contains files that define the formatting and layout of the window in a QML format.

NOTE Do not modify XML files and subdirectories within `builtin.toolclips`. This may adversely affect the operation of ToolClips.

Custom directory

You can create a custom directory for your ToolClip content and share it with other users. If you create a custom directory, note the following:

- The custom directory name must use the `.toolclips` extension.
- The custom directory must contain the `Control` and `Resources` subdirectories.

  `Control` – Place the `ToolClips.xml` file in this directory.

  `Resources` – Place custom ToolClip content (movies, images) in this directory.
- To view the ToolClips in Alias, set the **Shared Tool Clips location** in **Preferences > General Preferences > Help**.

Parts of the ToolClips XML file

The `ToolClips.xml` file is stored in the following locations:

- Windows

  `\Program Files\Autodesk\Alias2015\ToolClips\builtin.toolclips`
- Mac OS X

  `/Applications/Autodesk/Alias2015/Alias.app/Contents/ToolClips/builtin.toolclips`

Main elements

The main body of the XML file is defined by a single `<toolclips>` element.

The `<toolclips>` element has the following attributes:

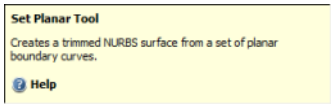
- `<ui>` – Specifies the location of the QML description. This file describes the layout of the default ToolClip window. By default, the `ToolClipUI.qml` file is located in the `builtin.toolclips\ui` directory.
- `<simple>` – Specifies the location of the simplified QML UI description. This file describes the way ToolClips appear when **Tool Tips** is enabled in **Preferences > General Preferences > Help**. By default, the `SimpleTooltip.qml` file is located in the `builtin.toolclips\ui` directory.
- `<locale>` – Specifies the language locale of ToolClips included in the `ToolClips.xml` file. The default attribute value is `en_US` (English).

  TIP If you are localizing ToolClips to Japanese or Simplified Chinese, you can use `ja_JP` or `zh_CN` as the attribute value.

Example code:

```
xml version="1.0" encoding="utf-8"
<toolclips ui="ui/ToolClipUI.qml" simple="ui/SimpleTooltip.qml"
locale="en_US”>
... </toolclips>
```

Level 1 ToolClip



Level 1 ToolClip

The following attributes define parts of a level 1 ToolClip.

- `<toolclip>` – Encloses all level 1 and level 2 ToolClip elements.
- `<key>` – The key name used to request the ToolClip.

  NOTE

  If a key name exists in two `ToolClip.xml` files within the ToolClip search path, Alias uses the key name that is encountered first.

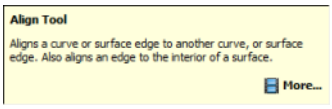
- `<help>` – (Optional) Specifies the location of the help link that is included in the ToolClip window when a level 2 ToolClip does not exist. The location can be a URL or an internal help string (as shown in the example code below).
- `<title>` – The tool title that displays in the ToolClip window.
- `<text>` – The summary text that displays in the ToolClip window.

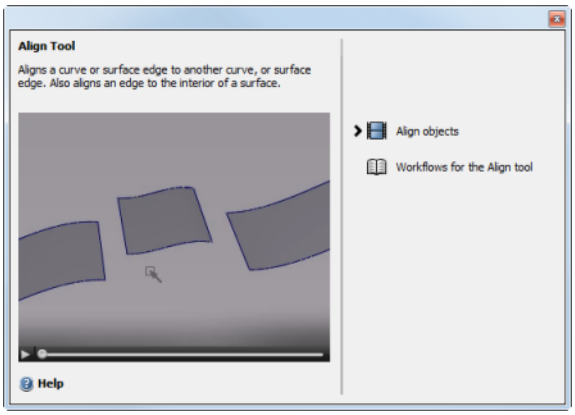
Example code:

```
 <toolclip key="SetFace" title="Set Planar Tool"
help="files/SurfacesPlanarsurfacesSetplanar.htm">
        <text>Creates a trimmed NURBS surface from a set of planar
boundary curves.</text>
    </toolclip>
```

Level 2 ToolClip

Level 2 ToolClips are optional and are used when additional learning content exists. When a level 2 ToolClip exists, the **More** button appears in the level 1 ToolClip window.





Level 2 ToolClip with level 2 data

The following attributes define parts of a level 2 ToolClip.

- `<expanded>` – Encloses all level 2 ToolClip data. If a ToolClip contains an expanded section, the **More** button appears in the level 1 ToolClip window.
- `<default-resource>` – (Optional) Specifies that a particular video or image resource within the ToolClip's resource list can be loaded into the viewer/player when the level 2 ToolClip is opened. The `<index>` attribute determines which resource list item is loaded in the viewer or player. For example, set the value to 2 to display the second item in the list. By default, the `<index>` attribute is set to 1.
- `<resourcelist>` – Specifies the list of resources to be displayed in the level 2 ToolClip window. You can include videos, images, and/or links to external resources.
- `<video>` – Adds a video to the resource list. Use the `<location>` attribute to indicate the name of the file and the title that appears in the ToolClip window. When creating custom ToolClips, all videos must be in WebM format and located in the `users.toolclips\Resources` or `<customdirectory>\Resources` subdirectory. The video resolution should be 304 x 228 (4:3 aspect ratio).
- `<image>` – Adds an image to the resource list. Use the `<location>` attribute to indicate the name of the file and the title that appears in the ToolClip window. When creating custom ToolClips, all images must be in JPEG or PNG format and located in the

`users.toolclips\Resources` or `<customdirectory>\Resources` subdirectory. The image resolution should be 304 x 228.

- `<link>` – Adds an external link to the resource list. Use the location attribute to indicate the location of the link and the title that appears in the ToolClip window. The location can be a fully qualified URL or an internal help string (as shown in the example code below).

Example code:

```
  <expanded>
            <resourcelist>
                <video location="Align.webm">Align objects</video>

                <link
location="files/Workflows_for_the_Align_tool.htm">Workflows for the
Align tool</link>
            </resourcelist>
        </expanded>
```

Simplified printing

We've simplified the entire printing experience in Alias.

- Print to a PDF file or printer, or generate a PDF file and send it by email.
- Print raster or vector images.
- Select Alias windows to print (Camera, Left, Top, Back, Bottom, Front, Right).
- For orthographic windows, scale and position images on the page.
- Specify which view elements to print (Grid, Background, Model).
  To print other view elements, select them in the Alias window.

Print Options

Destination

Select the destination for your print output.

Print

Send your print job to the printer selected under **Print Options**.

File Convert the page to a PDF or postcript file.

Page Size

If **File** is selected as the destination, select the page size for your PDF file output.

Print Options

If **Print** is selected as the destination, set the following options for your printer output.

Printer Select the printer from the list of available printers.

Size Select the page size for the print output.

When **Size** is **Custom Paper Size**, set the size in **Print Properties**

Print Properties Opens the properties window for the selected printer, where you can choose options such as paper source and print quality.

Copies Use the arrows to change the number of copies to be printed, or type the number of copies in the box.

Layout

Choose the orientation of the content on the page.

Portrait Print the content of the view vertically on the page.

Landscape Print the content of the view horizontally on the page.

Style

Choose the image format of the content to be printed.

Raster Print the content of the view as a bitmap image. Shapes are defined by pixels. Printing a raster image is quicker, but the line quality is not as good as printing vectors.

Vector Print the content of the view as vectors. With **Vector** selected, shapes are defined by mathematical equations, resulting in sharper printed results.

View

Choose which window view to print: **Camera**, **Top**, **Right**, **Front**, **Left**, **Back**, **Bottom**. Any new windows you create, also appear on the list. The content of the view appears in the Preview area.

Fit To Page Resizes the view to fit the paper. Large views are scaled down to fit. Smaller views are scaled up.

Select **Maintain Aspect Ratio** to resize the view proportionally.

Scale For orthographic views (**Top**, **Right**, **Front**, **Left**, **Back**, **Bottom**), select the ratio between modeling units and units on the page (for example 1:8). For actual size, select 1:1. For a scale not listed, select **Custom** and either enter the ratio, or a percentage.

View Options

Select the window elements to include in the printed page: **Grid**, **Background**, **Model**.

To print or hide other elements (such as the wireframe, guidelines, textures), show or hide them in the window before printing.

Margins

Left, Right, Top, Bottom Set the amount of margin space surrounding the view on the page.

Margin Units Select the margin units: **Inches** or **Millimeters.**

Alignment

For orthographic views that are scaled, place the model on the page relative to the center of the page.

Placement Select where to place the window on the page.

X – Align it to **Left** edge of the page, **Center** it horizontally on the page, or align it to the **Right** of the page.

Y – Align it to the **Top** edge of the page, **Center** it vertically on the page, or align it to the **Bottom** of the page.

Offset Offsets the window from the placed position.

Send PDF

Create a PDF file of the contents of the view and attach it to a new email using your default email application.

Print

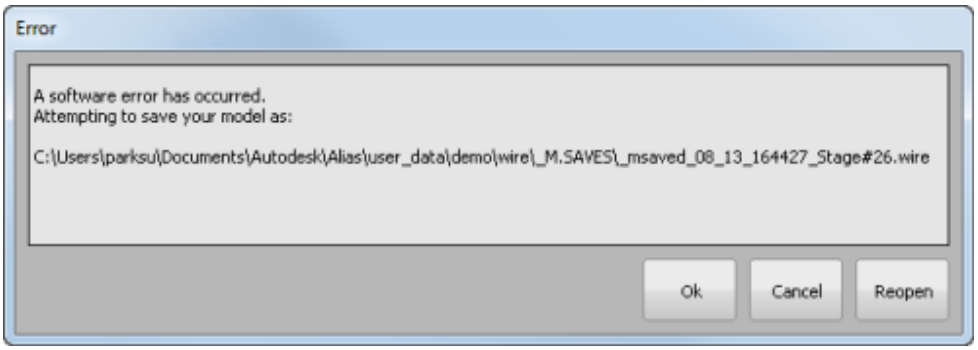
If the **Destination** is **Print**, send the contents of the view to the printer

Save

If the **Destination** is **File**, create a PDF file of the view and save it.

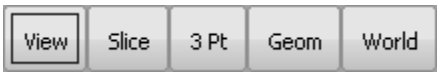
Enhancements to Msave

- When Alias terminates unexpectedly, Alias attempts to save your model in your current project folder. You are now prompted to choose whether you want to save the file, cancel the msave and go to the next stage, or reopen the stage in another session of Alias.



Construction Plane tool buttons restored

We restored the five **Construction Plane** tool buttons that appeared at the bottom of the view window and were removed in Alias 2013.



The buttons correspond with options in the Construction Plane Options window (**Construction > Plane**

). Each button allows you to create a different type of construction plane. With the buttons restored, you can select the tool with a hotkey and use the tool without opening the Construction Plane Options window. The Construction Plane tool continues to be shelvable.

The on-screen buttons are optional. You can ignore them by clicking in the display—the selection from the option window will be used instead.

New support for Desktop Analytics

We added support for Desktop Analytics.

Desktop Analytics collects the following information about product usage:

- **Unique user ID** - creates a record for each use of a product license, not associated with a specific person or user profile, as a means of linking the related usage data, as follows.

- **Product ID and license type** - specifies which products are used, and how they are licensed.
- **Product launch and close time** - indicates when each product is used, and the length of each work session.
- **Geographic location** - identifies only the country where the product is used.

This information will not be used to identify or contact customers.

Desktop Analytics complies with the *Autodesk Privacy Statement*.

Would you like to provide more input on product usage to assist the Autodesk® development team? If so, read about the *Customer Involvement Program*.

To opt out of the program

1. Choose **Help > Desktop Analytics Program**.
2. Deselect **Yes I would like to contribute to this program**.

New screen management feature

- You can *Shift*-click a tab on the palette to open or close all tabs in the palette. In this release, we added the ability to open a tab and close all others by *Alt*-clicking on the tab.
- Now when you open or close any window in a family windows, all windows in the family open or close. In previous releases, opening or closing a child window opened or closed that window only.

Assign random colors to layers

You can now randomly assign colors to layers without color by selecting **Layers > Random Colors** . Layers that already have colors assigned will retain their original color.

Visualization 3

This version of Alias presents improvements to rendering.

New shader in Multi-Lister creates a grey shader

Selecting **New Shader** in the Multi-lister now creates a grey shader (the default **DefaultShader**). It no longer creates a copy of the **DefaultShader**.

Evaluation

4

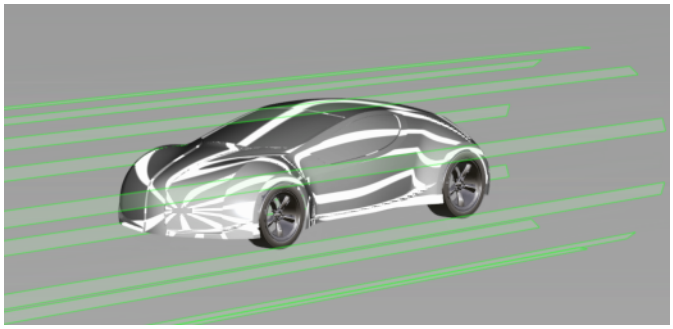
Describes changes to Evaluation tools

New diagnostic shaders

We added four new diagnostic shaders to Alias: **Light Tunnel**, **Clay with Ambient OcclusionIsophote Highlight**, and **VRED NURBS Analysis**.

Light Tunnel

Creates linear reflections on the model by surrounding it in a cylindrical tunnel of long lights. This is the same functionality found in the Hardware Shade Environment.



Show Tunnel Displays the tunnel, representing the lights as green bands.

Color Choose a color for the reflections. Move the slider to change the color value.

Transparency Sets the transparency of the shaded surfaces from opaque (0) to almost totally transparent (0.9).

Intensity Controls the relative brightness of the reflections. Values greater than one are equivalent to setting a light to the same intensity.

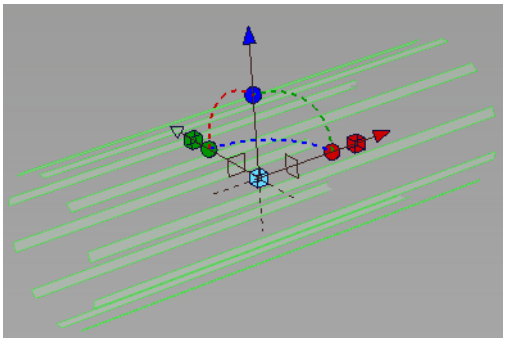
Number of Bands Controls the number of light bands used to form the tunnel.

Band Width Controls the width of the light bands.

Band Fringe Controls the edge transition of lights, ranging from a hard, sharp transition to a smooth, soft transition.

Center Tunnel Centers the tunnel at the origin.

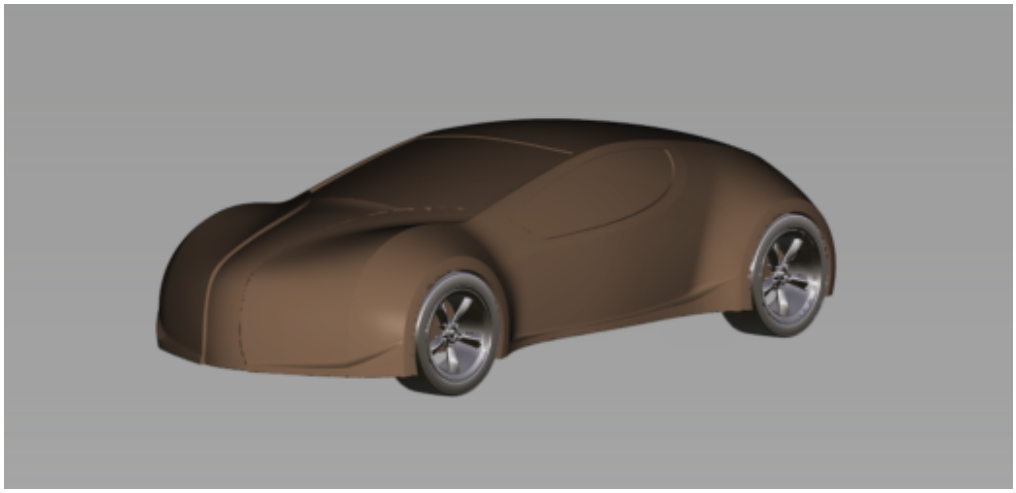
Show Manip Displays a manipulator for placing and scaling the light tunnel.



- Click the center move handle, then use curve snapping to snap the manipulator to the curve.
- Drag the arrows to move the light tunnel.
- Drag a cube to resize the tunnel: the red cube changes the length of the tunnel, the green cube changes the diameter, the cyan cube changes both the length and the diameter.
- Click a square plane to reorient the tunnel along another axis.
- Drag a dotted rotation arc to rotate the light tunnel.
- Drag a sphere to rotate the tunnel around an axis.

Clay with Ambient Occlusion

Gives the model the look of clay by shading it with a low specularity clay color. The clay shader supports the display of ambient occlusion (you must first calculate ambient occlusion to see the effect).



Color Choose a color for the clay. Move the slider to change the color value.

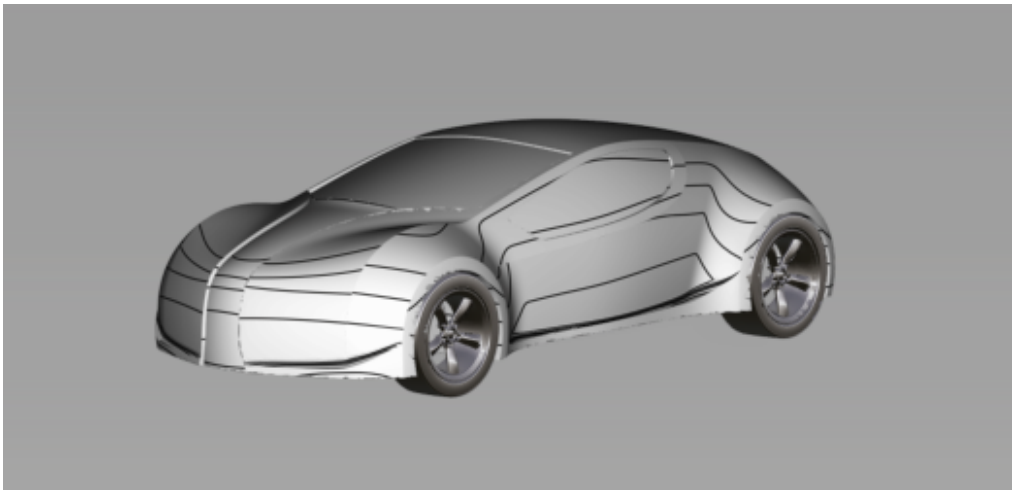
Show Occlusion If ambient occlusion has been calculated, displays the resulting shadow textures on the shaded model.

Concentration Increase this value to cause the occlusion shadow to be more concentrated in the areas where it is darkest.

Contrast Set how dark an area with ambient occlusion is. When the value is 1, areas with maximum ambient occlusion are rendered as if there is no ambient light.

Isophote

Displays thin, sharp lines to indicate spots of the same brightness (isophotes). This shader is useful for detecting discontinuities across surfaces.



Base Color Choose a color for the model. Move the slider to change the color value.

Stripe Color Choose a color for the isophote lines.

Transparency Sets the transparency of the shaded surfaces from opaque (0) to almost totally transparent (0.9).

Count Controls the number of isophote lines used.

Thickness Controls the thickness of the isophote lines.

Sharpness Controls the sharpness of the isophote lines. increasing the value blurs the line edges.

Use Camera View Vector Uses the current camera view vector for the light direction so the lines move over the model as you tumble.

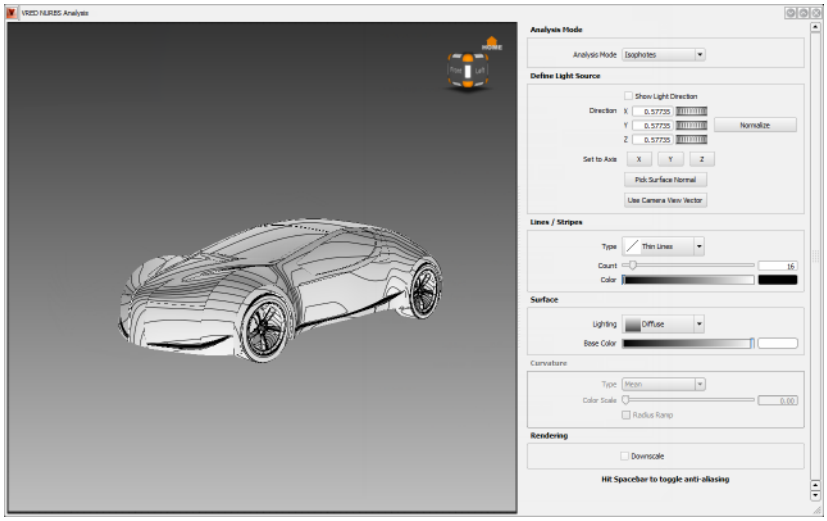
When this option is not selected, the lines remained fixed.

X, Y, Z Sets the position of the light when **Use Camera View** is not selected. Click **X**, **Y**, or **Z** to set the direction to X (1, 0, 0), Y (0, 1, 0), or Z (0, 0, 1), respectively.

VRED NURBS Analysis

We added a new diagnostic shader that sends the selected surfaces to VRED NURBS Analysis to perform ray tracing directly on the NURBs surfaces.

You can display different types of virtual lines on the objects in the scene to examine the continuity of surfaces.



To analyze surfaces in VRED NURBS Analysis

1. Select the surfaces you want to analyze.
2. In the Diagnostic Shade window, click the **VRED NURBS Analysis** diagnostic shader. VRED NURBS Analysis opens.
3. Select an **Analysis Mode** and set options.
4. To center the all geometry in the scene in the view (look at), press *Shift*+F

   To center selected geometry in the view, select the geometry (*Shift*-click) and press F.

   To toggle anti-aliasing, press the *spacebar*.

VRED NURBS Analysis Options

Analysis Mode

Activate Surface Analysis Projects lines on the objects in the scene for analyzing the quality of surfaces.

Analysis Mode Select the type of lines to display for analysis:

Isophotes – Displays isophotes (lines of equal brightness on the surface). With isophotes you can determine whether a surface is continuous in position, tangency, or curvature. The surface is assumed to be perfectly diffuse reflecting. It is lit from both sides by a directional light emitting parallel light beams. You can set the direction of the light source. The isophote

lines are view-independent meaning that the lines do not change when moving the camera (except when using the option **Use Camera View Vector**).

Highlight Lines – Displays locations on the surface where the extended surface normals intersect the light lines. Highlight lines are view independent.

Reflection Lines – Displays reflections of light lines on the surface. Reflection lines are view independent.
Both Highlight Lines and Reflection Lines need light lines to be defined as a kind of virtual light source. You can choose between two different shapes on which the light lines appear.

Longitudinal Lines on a Sphere – The lines are meridians on a sphere (lines from pole to pole) which encloses the scene and is of infinite size. You can set the axis of the sphere.

Parallel Linear Lines on a Plane – The lines are parallel and straight on a plane. You can set their position and rotation.
Curvature (NURBS only) – Color-codes the curvature of the surfaces.

Define Light Source

Not applicable to **Curvature (NURBS only)** analysis mode.

For Isophotes

Show Light Direction Displays the light direction as an orange arrow in the render view. You can change the light direction by *Shift*-dragging the rotation manipulator or by entering precise X, Y, Z direction values. The translation manipulator does not change the direction of the light and therefore does not affect the isophotes.

Direction Change the direction of the light by setting X, Y, and Z coordinates.

Normalize Scales the direction vector to a length of 1.0.

Set to Axis Sets the direction to X (1, 0, 0), Y (0, 1, 0), or Z (0, 0, 1).

Pick Surface Normal Enters a mode where you can pick a surface normal as the light direction, sphere axis, or plane normal, depending on which analysis mode is selected.

- *Shift* + *left mouse button* to pick a surface normal.
- To exit the mode, click the button again.

Use Camera View Vector Uses the current camera view vector for the direction of the light. To select a different light direction, click the button again.

For Highlight/Reflection Lines with Longitudinal Lines on a Sphere

Show Sphere with Light Lines Displays the light sphere with its light lines in the render window.

The sphere used for mapping the lines on the surfaces is of infinite size.

You can change the axis of the sphere by *Shift*-dragging the rotation manipulator.

Sphere Rotation Change the direction of the light by setting X, Y, and Z coordinates.

Set to Axis Sets the direction to X (1, 0, 0), Y (0, 1, 0), or Z (0, 0, 1).

Pick Surface Normal Enters a mode where you can pick a surface normal as the light direction, sphere axis, or plane normal, depending on which analysis mode is selected.

- *Shift + left mouse button* to pick a surface normal.
- To exit the mode, click the button again.

For Highlight/Reflection Lines with Parallel Linear Lines on a Plane

Show Plane with Light Lines Displays the light sphere with its light lines in the render window.

The sphere used for mapping the lines on the surfaces is of infinite size.

You can change the axis of the sphere using the rotation manipulator.

Light Plane Origin Set coordinates of the origin of the light plane.

Light Plane Rotation Specify the number of degrees to rotate the plane around the X, Y, and Z axes.

Lines Spacing Specify the spacing between the lines on the plane. The default is 10.00.

Limited Lines Length Limits the length of the lines to the number you specify. The default is 1000.00.

Pick Surface Normal Enters a mode where you can pick a surface normal as the light direction, sphere axis, or plane normal, depending on which analysis mode is selected.

- *Shift + left mouse button* to pick a surface normal.
- To exit the mode, click the button again.

Lines / Stripes

Not applicable to **Curvature (NURBS only)** analysis mode.

Type Select the style of analysis line to display:

Thin Lines – Displays thin sharp lines.

Stripes – Displays stripes. You can modify the **Sharpness** and **Thickness** of the stripes.

Zebra – Uses a classical zebra pattern.

Count The number of isoline highlight bands on the surface.

Color The color of the highlight bands. Click to open the **Choose a Color** dialog box and select a color.

Surface

Not applicable to **Curvature (NURBS only)** analysis mode.

Lighting Select the surface lighting to render the surface:

Ambient – The surfaces are displayed single-colored. The color is defined by **Base Color**.

Diffuse – The surfaces are assumed to be diffuse. Set the diffuse reflection color using **Base Color**.

Phong – The surfaces are lit with the phong lighting model. You can use **Base Color** to set the diffuse reflection color, the glossy reflection color using **Glossy Color**, and **Roughness**.

NURBS UV – Show the parameterization of NURBS surfaces. Triangle meshes are displayed in **Ambient** mode.

Base Color The color of the surface. Click to open the **Choose a Color** dialog box and select a color.

Curvature

Applicable only to **Curvature (NURBS only)** analysis mode.

Type The method of calculating curvature on the surface. **Mean** averages the two principal curvatures at each point on the surface.

Color Scale Scales the radius ramp to show finer details of curvature variation.

Radius Ramp Select this option to show the range of colors that will be applied to the curvature map (and their corresponding curvature radius values).

If the +/- band is set to 0.0, the curvature map is relative, and the ramp colors, from left to right, represent increasing curvature values. (The colors are not associated with specific values.)

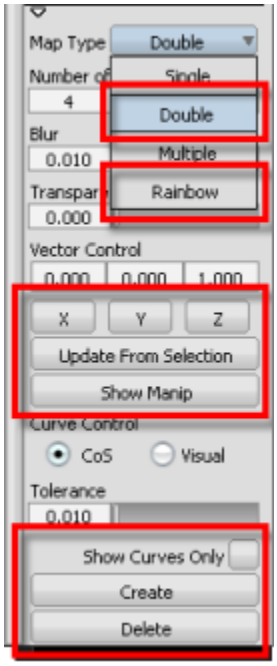
If you adjust the **Color Scale**, the radius ramp updates interactively.

Rendering

Downscale Select this option to turn off anti-aliasing. Press the *spacebar* to toggle anti-aliasing on and off.

Simplified Iso Angle evaluation

Now you only need the **Iso Angle** diagnostic shader to evaluate continuity across surfaces using iso angles. We moved the **Iso Angle** tool options to the **Iso Angle** diagnostic shader and removed the **Iso Angle** tool from the **Evaluation** tab in the palette.



Additionally, we:

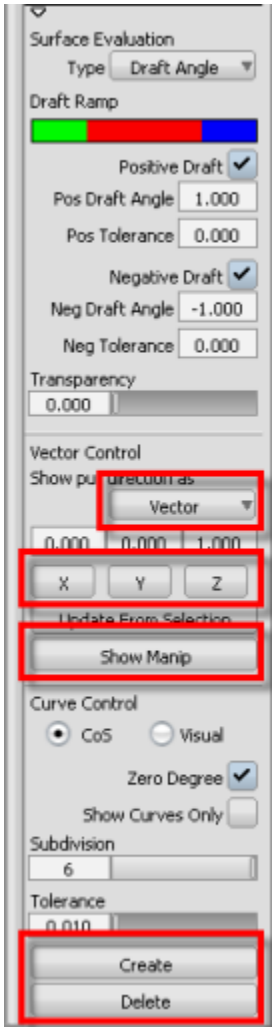
- Added the **Double** map type, which displays a wide iso angle line.
- Added the **Rainbow** map type, which displays bands corresponding with each color of the rainbow.
- Added three buttons to align the light source vector with the **X**, **Y** and **Z** axes.
- Added **Update From Section** button to set the direction of the light source to be that of an already selected vector or plane. In the case of a plane, the direction perpendicular to the plane is used.

  The X, Y, Z fields are automatically set to the coordinates of the picked vector.

- Moved the **Show Manipulator** button that appeared in the view when the **Iso Angle** tool was selected to the diagnostic shader window.
- Added **Show Curves Only** option to disable the shading and show the iso angle lines as curves only.
- Added **Create** and **Delete** buttons to create and delete iso angle curves.

Simplified Surface Evaluation

Now you only need the **Surface Evaluation** diagnostic shader to create curves-on-surface along draft lines. We moved the **Parting Line** tool options to the **Surface Evaluation** diagnostic shader and removed the **Parting Line** tool from the **Evaluation** tab in the palette.



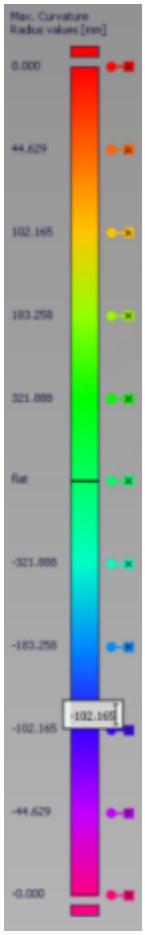
Additionally, we:

- Changed the default pull direction of the vector from **Rotation** to **Vector**.

- Added a **Show Manipulator** button that displays a modified vector manipulator. There is no longer a **Go** button.
- Added three buttons to align the pull vector with the **X**, **Y** and **Z** axes.
- Added **Show Curves Only** option to disable the shading and show the draft lines as curves only.
- Added **Create** and **Delete** buttons to create and delete draft curves.

Curvature Evaluation diagnostic shader improved

The curvature ramp for the **Curvature Evaluation** diagnostic shader is now interactive. You can add, remove, and move ramp entries and set the scale value by adding curvature values at set locations.



- To add an entry, double-click on the ramp.
- To move an entry, drag the circular handle.

  To change the color, double-click the circular handle. The Ramp Color window opens, where you can select the color you want.
- To remove an entry, `Shift`-click the x handle.
- To change the curvature radius values, double-click the value, type the new value and press `Enter`. When the value is at, or near 0.5, the value is indicated as "Flat".

Modeling

5

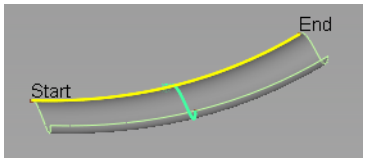
Profile Tool enhancements

We added some new options that will give you the ability to rotate or slide a profile to touch a curve or surface. These options are under **Profile orientation**.

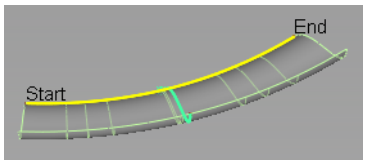
We moved **Parallel** and **Radial** from the **Profile orientation** option to a new **Frame Travel** option.

Profile Orientation

Natural – The orientation of the profile frame is determined only by the **Frame Travel**.

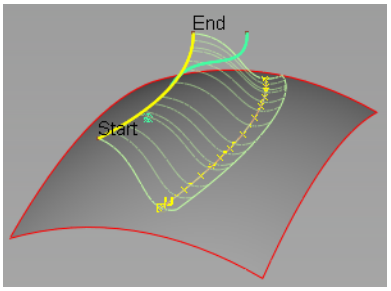


Natural Orientation, Parallel Frame Travel

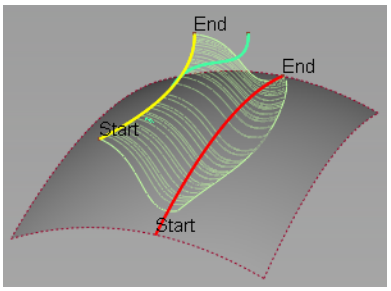


Natural Orientation, Radial Frame Travel

Rotate to Target – The profile rotates about the rail curve until it touches a selected **Profile Target**.

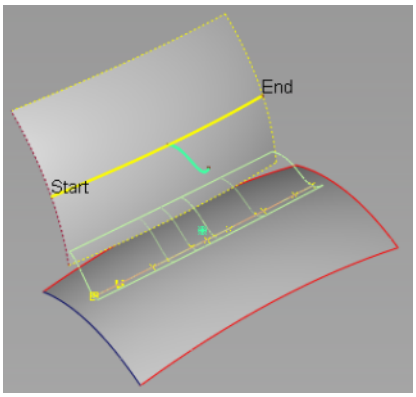


Rotate to Target Orientation, Surface Target, Radial Frame Travel

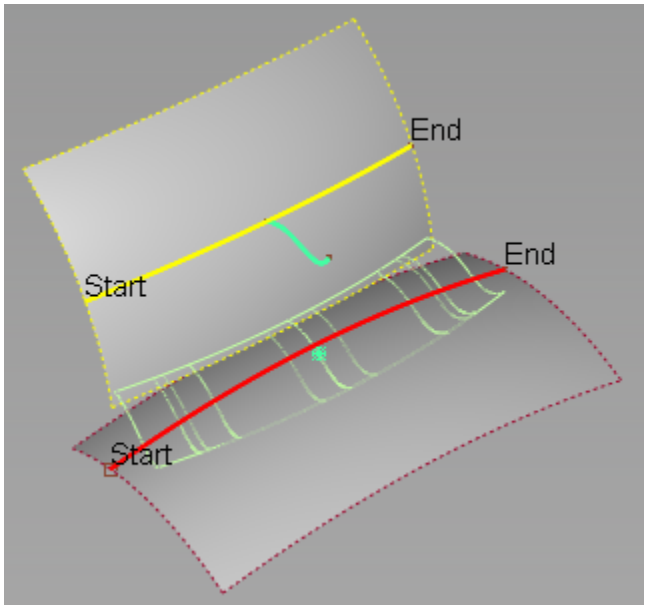


Rotate to Target Orientation, Curve Target, Radial Frame Travel

Slide to Target – The profile slides along an attached surface until it touches the selected **Profile Target**. The profile rotates so that the profile frame remains tangent to the sliding surface.

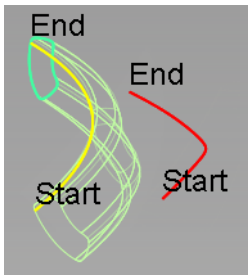


Slide to Target Orientation, Surface Target, Radial Travel



Slide to Target Orientation, Curve Target, Radial Travel

Guide Curve – The orientation of the profile frame is determined by the normal direction of an adjacent curve.



Guide Curve Orientation, Proportional Scaling, Parallel Travel

Surface Normal – The orientation of the profile frame is determined by the normal direction of an adjacent surface at the closest point between the rail curve and the surface.

2nd Rail – The orientation of the profile is determined by connecting the profile curve to two rail curves.

Profile Target

Surface Target – If **Rotate to Target** is selected, the profile rotates around the point where it meets the rail curve until it touches the target surface . If **Slide to Target** is selected, the profile "slides" along an attached surface until it touches the target surface.

If **Use Profile Point** is also selected, the profile rotates or slides until the selected point on the profile touches the surface.
Curve Target – If **Rotate to Target** is selected, the profile rotates around the point where it meets the rail curve until it touches a selected curve. If **Slide to Target** is selected, the profile "slides" along an attached surface until it touches the target curve.

If **Use Profile Point** is also selected, the profile rotates or slides until the selected point on the profile touches the curve.

Use Profile Point

If **Use Profile Point** is also selected, the profile rotates or slides until the selected point on the profile touches the surface or curve.
If **Rotate to Target** or **Slide to Target** are selected, enables you to select the point on the profile that will touch the target.

Profile Scaling

Scales the profile with the influence of the target curve.

No Scaling – Does not scale the profile.

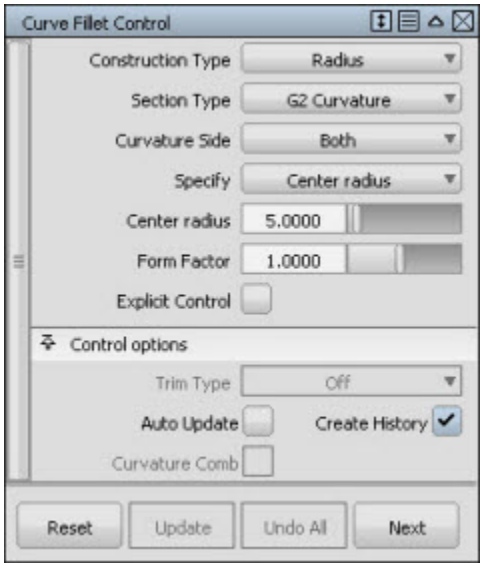
Non-proportional Scaling – Scales the profile non-proportionally in one dimension.

Proportional Scaling – Scales the profile proportionally in two dimensions of the local coordinate system.

New Curve Fillet tool

We created a new **Curve Fillet** tool (**Curve Edit > Create > Curve Fillet**). With it you can:

- create chamfers that are degree 1-3; G1 fillets, degree 3-6; and G2 fillets, degree 5-7
- create fillets with curves, curves-on-surface, and edges
- fillet between non-planar inputs
- create fillets that are G1 tangent or greater with form factor capability



Curve Fillet options

Construction Type

Radius – Produces a fillet where you control the radius value at the center of the fillet (but not the width of the fillet).

Chord – Produces a fillet where you control the distance between the two ends of the fillet (but not the radius). Use the **Chordal Length** or **Tangent Length** option to set the distance to maintain.

Section Type

G0 Chamfer – Creates a chamfer edge between the two curves. This type maintains only position continuity with the curves at both ends of the fillet.

G1 Circular – Creates a circular fillet. This type maintains tangent continuity with the curves at both ends of the fillet.

G1 Tangent – Maintains tangent continuity with the curves at both ends of the fillet

G2 Curvature – Maintains curvature continuity (G2) with both curves. G2 continuity means that the curvature (which is the inverse of the radius of curvature) is the same on both sides across the fillet's boundaries.

G3 Curvature – Maintains G3 continuity with both curves. G3 continuity means that the curvature's rate of change is the same on both sides across the fillet's boundaries.

Curvature Side For **G2** and **G3 Curvature** section types only.

Specify

For **Radius** construction type, with **G1 Tangent**, **G2 Curvature**, or **G3 Curvature** section types, select which values to specify to define the fillet: **Tangent Offset**, **Center Radius**, or **Both**. **Both** lets you specify both the **Tangent Offset** and **Center Radius** of the fillet but not the **Form Factor**. The form factor is calculated automatically from these two values and varies along the fillet.

Tangent Offset Radius of a circle that is tangent to both input curves at the endpoints (that is, contact points).

Center Radius Radius at the center of the fillet (as measured along the arc length).

Radius For **Radius** construction type, with a **G1 Circular** section type. Radius at the center of the fillet (as measured along the arc length).

Form Factor

Adjusts the shape of the fillet. It specifies the ratio between the lengths of the innermost and outermost CV arms of the fillet hull. Values range from 0.1 to 2.0. The smaller the value, the sharper the bend in the fillet.

Chordal Type For **Chord** construction type, select which values to specify to define the fillet, **Tangent Length** or **Chordal Length**.

Tangent Length – The length of the tangent segment.

Chordal Length – The distance between the two sides of the fillet.

Fillet Plane

Automatic – Uses a fillet plane that is automatically determined.

Specify – Lets you specify the fillet plane using the Fillet Plane Options, or the fillet plane manipulator.

Explicit Control Gives you control of the curve degree of the new fillet curve.

Fillet Plane Options

These options are available only when **Fillet Plane** is set to **Specify**.

Explicit Control Options

These options are only available when **Explicit Control** is selected.

Control Options

Trim Type Automatic – Automatically trims the original curves back to the contact line.

Off – Does not trim the original curves.

Auto Update Automatically updates the fillet curve as you change options.

If you turn this option off, you can click the Update button when you want to update the curve.

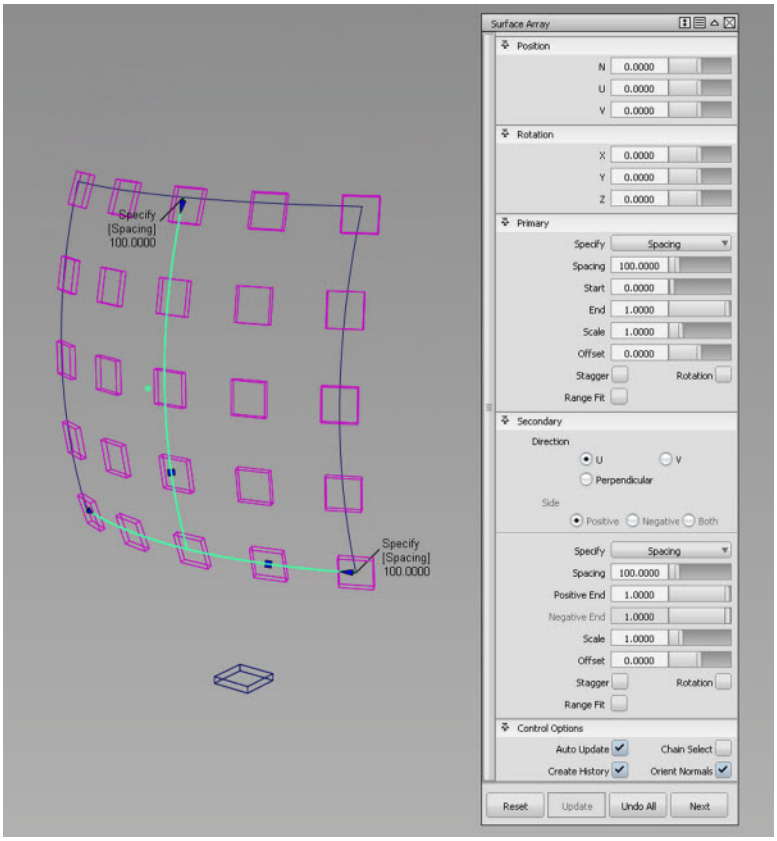
Curvature Comb Displays a curvature comb plot across the resulting fillet curve.

Create History

Save the fillet curve history for later editing. If you select Create History, when you edit the original curves, the fillet updates automatically.

New Surface Array tool

With the new **Surface Array** tool (**Transform > Arrays > Surface Array**), you can create arrays across surfaces in multiple directions.


Surface Array
Position
N 0.0000
U 0.0000
V 0.0000
Rotation
X 0.0000
Y 0.0000
Z 0.0000
Primary
Specify Spacing
Spacing 100.0000
Start 0.0000
End 1.0000
Scale 1.0000
Offset 0.0000
Stagger
Rotation
Range Fit
Secondary
Direction
U
V
Perpendicular
Side
Positive
Negative
Both
Specify Spacing
Spacing 100.0000
Positive End 1.0000
Negative End 1.0000
Scale 1.0000
Offset 0.0000
Stagger
Rotation
Range Fit
Control Options
Auto Update
Chain Select
Create History
Orient Normals
Reset
Update
Undo All
Next
Specify
[Spacing]
100.0000
Specify
[Spacing]
100.0000

To create a Surface Array

1. Choose **Transform > Arrays > Surface Array**
   
2. Select the object to duplicate. Click **Accept**
3. Select surface edge or curve on surface for the primary direction. The surface array is built.

   NOTE If **Number** is **1** for the primary and secondary direction, you will only see the original object

4. Adjust the options in the control window. If **Auto Update** is checked, the surface array updates automatically. Otherwise click the **Update** button.

Surface Array options

Position Offset in the N, U, and V directions along the duplicates local axes.

Rotation Rotation around the local, X, Y, and Z axes of the duplicates.

Primary

Specify Choose to duplicate by Spacing or Number.

Spacing Choose distance between duplicates.

Number Choose number of duplicates.

Start / End Specifies where the duplicates **Start** and **End** in the primary direction of the surface. These can be adjusted in the control window or with in-canvas range manipulators.

Scale This is a relative scale factor applied to the original object to produce the last duplicate in each row . The size of the intermediate duplicates is interpolated.

Offset Offsets each row in the array by this distance from the previous row.

Stagger Offsets each row half of the spacing value, creating a "stagger" effect.

Rotation When checked, displays fields to change the **Incremental Rotation** of the duplicates in the **X**, **Y** and **Z**.

Range Fit Expands the array to fit within the start and end range.

Secondary

Direction If **U** is selected, the objects will be laid out along **U** isoparms. If **V** is selected, they will be laid out along V isoparms. If the target is a U or V isoparm, the **U** or **V** direction will be selected by default and is dependent on the primary direction.

Perpendicular creates the secondary direction perpendicular to the primary direction.

Side Creates the secondary direction of the array on the **Positive, Negative** or **Both** sides of the primary input.

Specify Choose distance between duplicates.

Spacing Choose distance between duplicates.

Number Choose number of duplicates.

Positive End / Negative End Specifies the start and end of the secondary direction duplicates on the positive and negative side of the primary input.

Scale This is a relative scale factor applied to the original object to produce the last duplicate in each row . The size of the intermediate duplicates is interpolated.

Offset Offsets each row in the array by this distance from the previous row.

Stagger Offsets each row half of the spacing value, creating a "stagger" effect.

Rotation When checked, displays fields to change the **Incremental Rotation** of the duplicates in the **X**, **Y** and **Z**

Range Fit Expands the array to fit within the positive and negative end range.

Control Options

Auto Update When this box is checked, duplicates update automatically when values in the control window are changed.

Chain Select When checked, selecting a surface also selects all other curves that are tangent continuous with it.

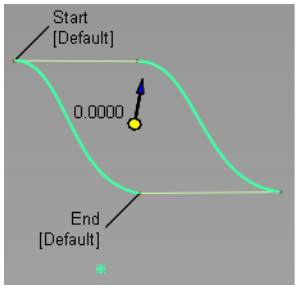
Create History When checked, the duplicates have construction history. Modifying the stitch objects or target curves causes the duplicates to update accordingly.

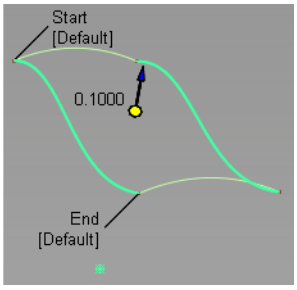
Orient Normals Check this box to align the local X axis of each duplicate with the tangent of the target curve at the position of the duplicate. If the target curve is a curve-on-surface, each duplicate is oriented so that its local Z axis matches the normal direction of the surface where the curve-on-surface lies.

Proportional Crown manipulators

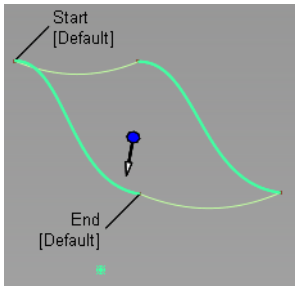
The **Freeform Blend** and **Skin** tools now have a manipulator to update the Proportional Crown settings directly on the model.

- Drag the circle to change the **Crown Value**. The value adjusts in 0.005 increments. Use the left mouse button for adjustments, the middle mouse button for fine adjustments.



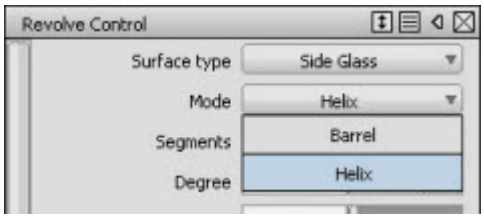


- Click the arrow to **Flip** the crown direction.

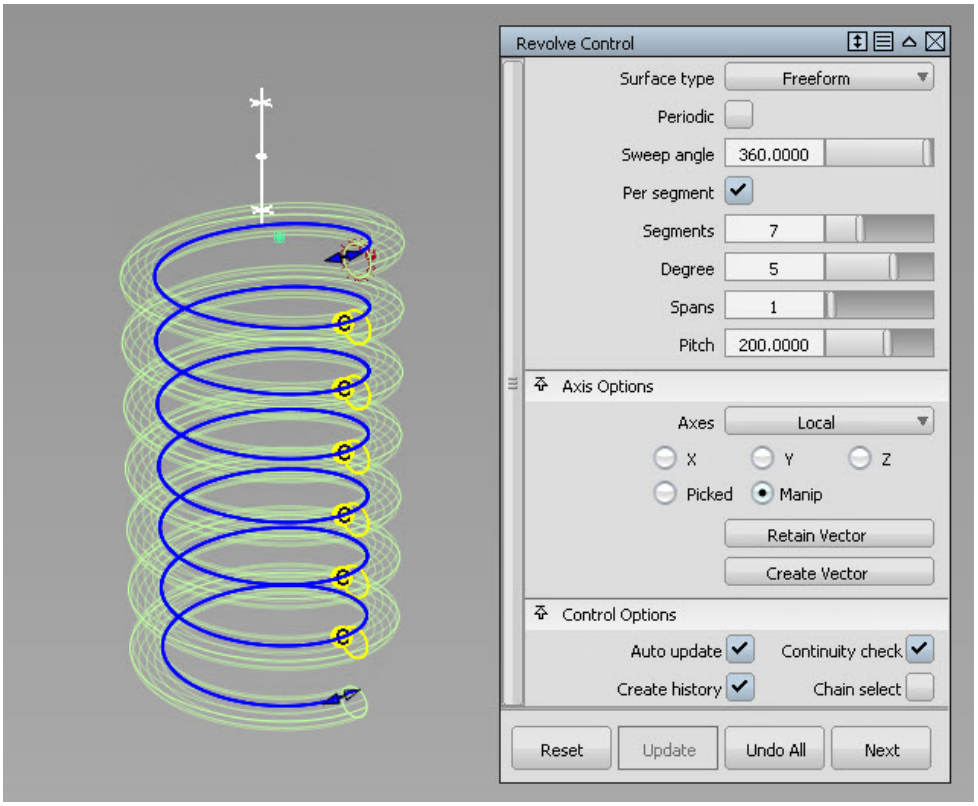


Revolve tool improvements

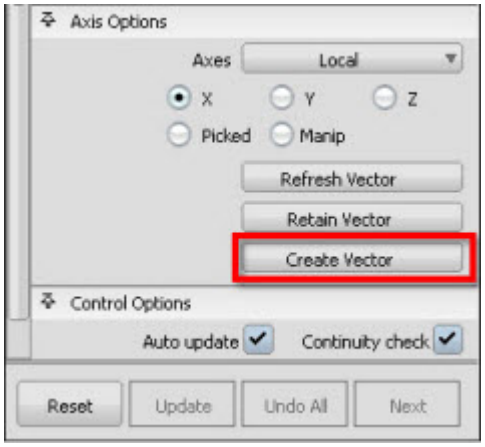
- We added a radius manipulator to the **Revolve** tool.
- **Barrel** and **Helix** are grouped under a new **Side Glass** surface type.



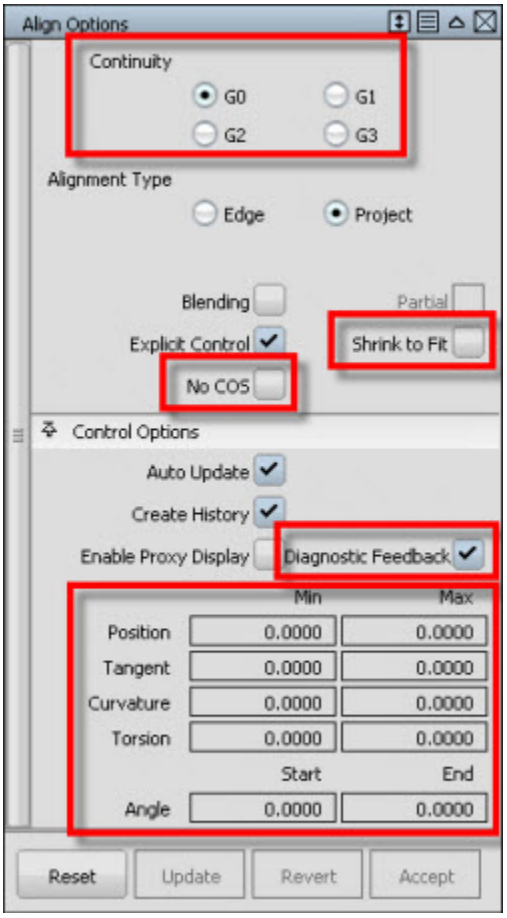
- In **Barrel** or **Helix** mode, we added an **Edit Points** button to the view so that you can go back into point editing mode after moving the axis.
- In Freeform mode, we added a **Per Segment** option to specify the sweep angle per segment instead of for the entire revolution.
- You can build helix surfaces in **Freeform** mode using the **Pitch** option.



- You can create a vector within the tool to use as a revolve axis.


Axis Options
Axes
Local
X
Y
Z
Picked
Manip
Refresh Vector
Retain Vector
Create Vector
Control Options
Auto update
Continuity check
Reset
Update
Undo All
Next

Align tool improvements



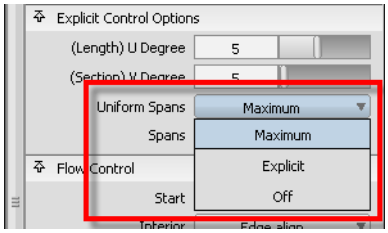
- We changed the **Continuity** types from menu selection to radio button selection for more efficient use of the tool.
- In **Project** mode:
  - We added a **Shrink to Fit** option that ensures the projection happens when the slave surface overlaps the master surface. When **Shrink to Fit** is selected, the position row is compressed to fit onto the master surface.
  - We added a **No COS** option that does a projection align without creating a curve-on-surface. **Continuity Check** is disabled without a curve-on-surface.
  - When **G1** or greater continuity is selected, the manipulator arrows that appear on interior CVs now behave like the **Transform CV** tool in **SLIDE** mode.

- We added a **Diagnostic Feedback** option. When selected, the minimum and maximum **Position**, **Tangent**, **Curvature**, and **Torsion** values display, and the start and end **Angle** values display.

Surface Fillet improvements

- The quality of surface rails on **G0 Chamfer** surfaces has been improved.
- Chordal surface fillets have been improved:
  - They now work with **Chordal Length**.
  - They match better with neighboring circular fillets.
  - They are more circular in shape and less like freeform blends.
  - They are more consistent across internal multi-surface boundaries.
  - Fillet quality has been improved for situations where the underlying surfaces do not intersect. It is no longer necessary to extend a surface so the surfaces intersect.

- To give you better control over the number of spans for each fillet surface, we changed the **Uniform Spans** option to include three options: **Maximum**, **Explicit**, and **Off**.



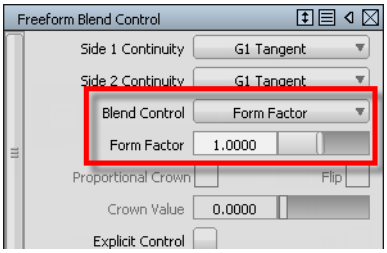
Maximum uses the specified number of spans or less, if it achieves continuity.

Explicit uses the exact number of specified spans, regardless of whether continuity is achieved with a lesser number of spans.

Freeform Blend improvements

Form Factor has been added to the **Freeform Blend** tool.

Select **Form Factor** from the **Blend Control** drop-down menu to control the shape of the blend when **Continuity** is set to **G1, G2** or **G3 Curvature**. This is the same math used in the **Surface Fillet**, **Symmetric Fillet**, **Fillet Flange**, **Tube Flange**, and **Panel Gap** tools.



Form factor math will work only on surfaces that would blend to create a "shoulder" (both edges would need to be extended for the surfaces to intersect).

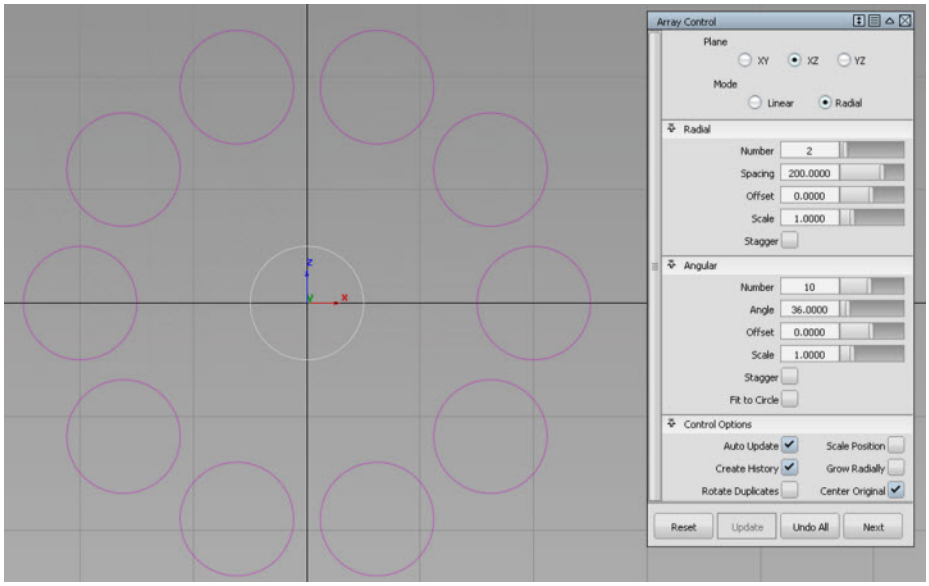
Skin tool improvements

- The quality of Bezier surfaces created with the **Skin** tool has been improved, particularly in cases where rail curves are segmented.
- Picking has been improved to work more like the **Skin 2012** tool.
  - Pick two curves to build a skin. Pick the third curve to start a new skin operation.
  - To build a skin from three curves, hold the `Shift` key when you pick the third curve. If **Auto Update** is not selected, you can pick as many curves as you want before you click **Build** to create the skin. Curves can be added or removed by holding `Shift` and clicking.
  - If you have already built a skin, box selecting additional curves without holding `Shift` starts a new skin.
- In-canvas manipulators were added for controlling **Proportional Crown**. Click on the manipulator arrow to flip direction and drag the blue dot to increase or decrease crown.
- The patch layout of the skin surface has been improved.

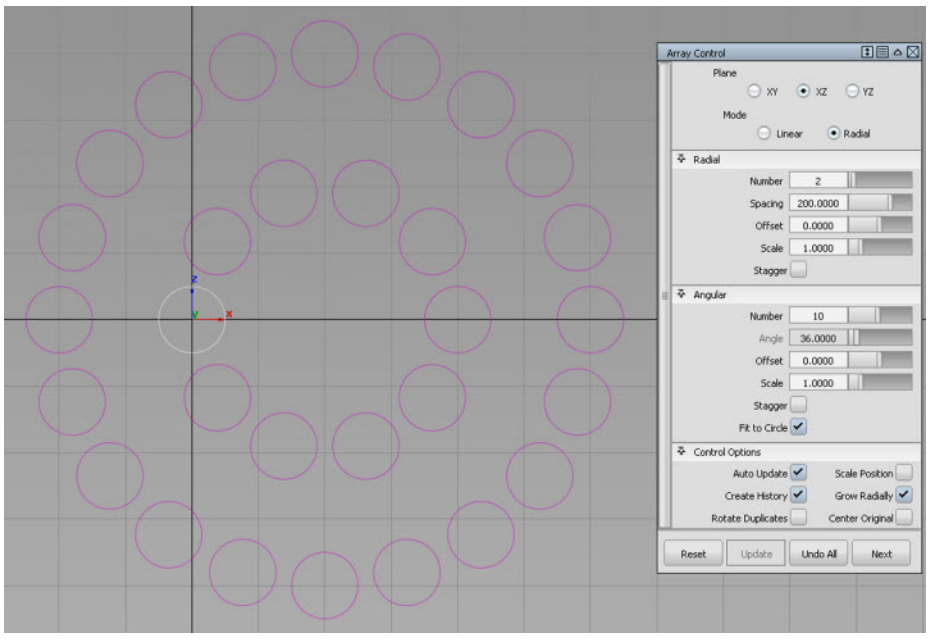
Array tool improvements

- We added a **Center Original** option to the **Radial** mode of the **Array** tool.

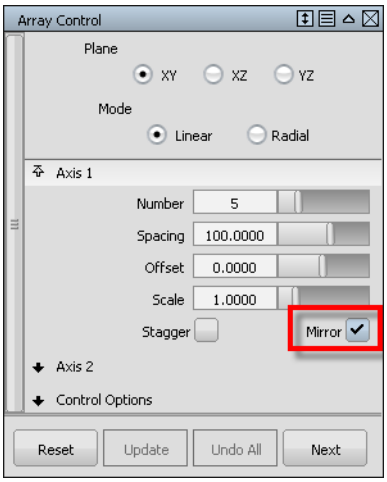
  When the option is selected, the tool works as before. The selected object is at the center and copies are created radially around it.



When not selected, the tool creates duplicates around a point beside the original based on the spacing value. The middle object is not created.

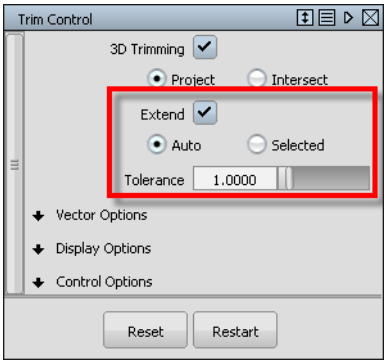


- We added a **Mirror** option to the **Linear** mode of the **Array** tool so you can easily create linear patterns from the center of an array.



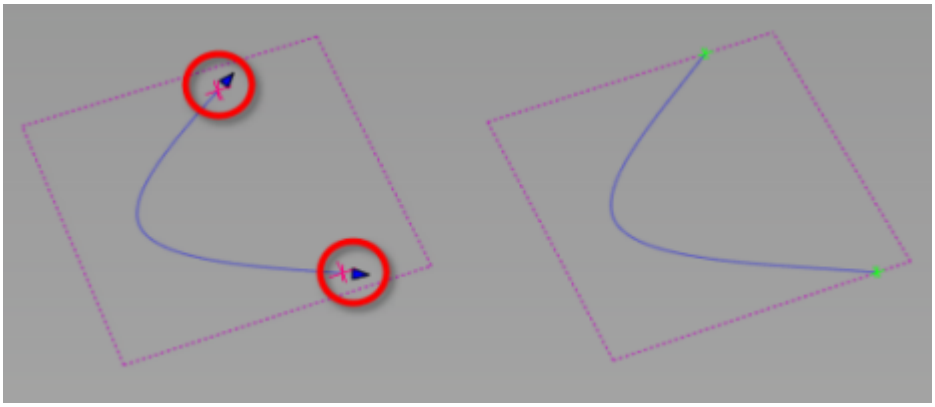
Trim and Trim Convert tool improvements

- You can now extend a curve that does not project entirely on the patch, either automatically or manually, and continue the trim operation without leaving the **Trim** or **Trim Convert** tools.



Auto – When the trim fails, any curves-on-surface that are within the set **Tolerance** of another curve-on-surface or boundary are extended and the trim is attempted again.

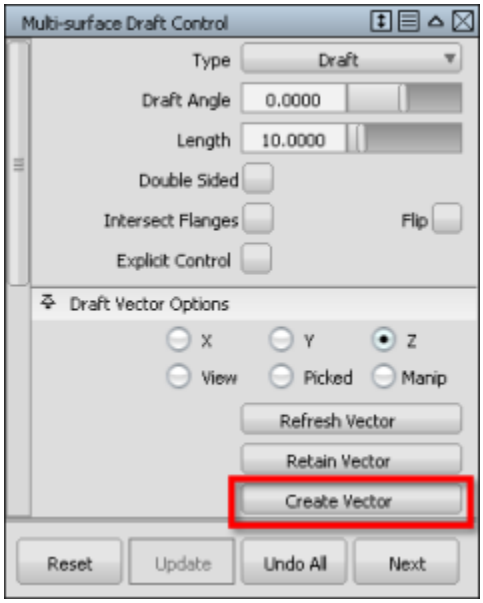
Selected – A trim extend arrow appears on the curve that needs extending. Clicking the arrow snaps the end of the curve to the patch edge.



- You can create a vector within the **Trim** and **Trim Convert** tools.
- We added a **Divide** button to the **Trim Convert** tool that trims and divides the input surface and then attempts to convert all the resulting faces into untrimmed surfaces. Only four-sided faces will successfully convert.

Multi-Surface Draft tool improvements

You can now create a draft vector while in the **Multi-Surface Draft** tool.



Offset tool improvements

The CV layout of offset surfaces has been improved. Tangent continuity between offset surfaces is now maintained when **Normal Mode** is set to **NUV**.

Transform CV and Prop Mod tool improvements

- You can now use the **Transform CV** and **Prop Mod** tools across multiple connected curves with tangent continuity.
- The direction of movement across multiple surfaces is now unified in the NUV mode of the **Prop Mod** tool. All CVs move in the same direction regardless of the UV layout of the object.

Circle tool enhancements

The **Circle** tool now has a **Segments** option that specifies the number of curve segments that will form the circle.

It is no longer the case that the sum of the **Degree** and number of **Spans** for a non-periodic circle cannot exceed 16.

Vector creation within tools

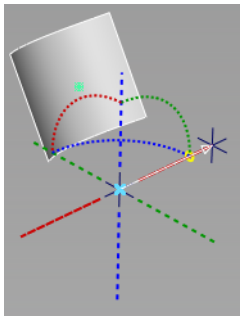
You can now create vectors while in the following tools:

- **Revolve** tool – revolve axis.
- **Multi-Surface Draft** and **Fillet Flange** tools – draft pull direction vector
- **Trim**, **Trim Convert**, and **Project** tools – projection vector
- **Tube Flange** tool – parting line pull direction vector

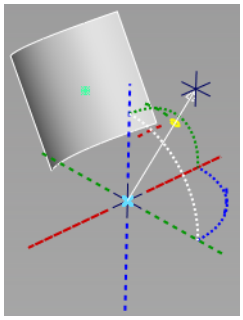
Rotate around a vector

We added the ability to rotate around a vector.

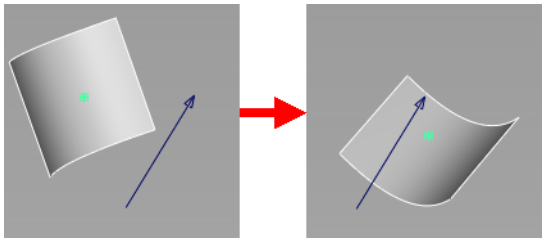
1. Choose **Transform > Rotate**  and select **Vector**.
2. Create the vector by clicking in the view where you want the vector to start or typing the start position in the prompt line.



3 Adjust the manipulator to position the vector and click **Accept**.



4 Enter a sweep angle on the prompt line.



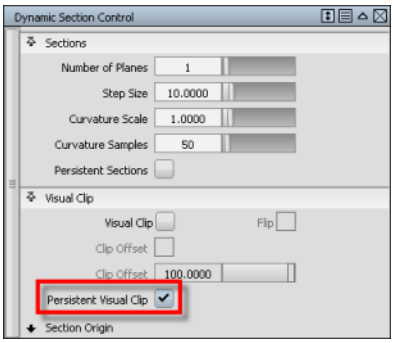
Construction Plane improvements

When you create a **Geom** type construction plane, the plane is now oriented parallel to the view plane.

Dynamic Section improvements

You can now set the visual clip in the **Dynamic Section** tool to be persistent. When you exit the **Dynamic Section** tool with **Persistent Visual Clip** selected, the visual clipping

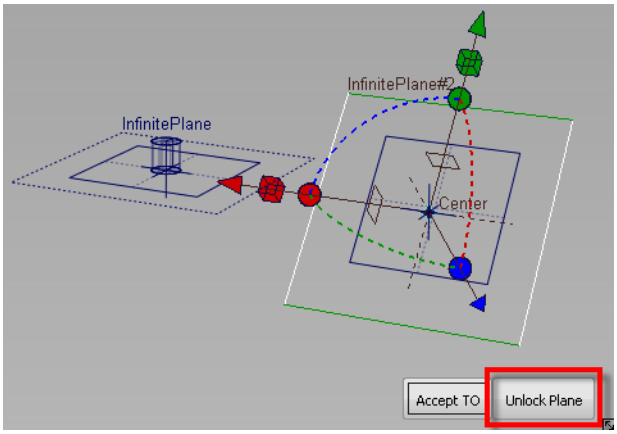
planes do not disappear, so you can now print the section display, measure the section, do anything to the section outside the tool.



Dynamic Section now supports Query Edit when **Persistent Sections** is checked.

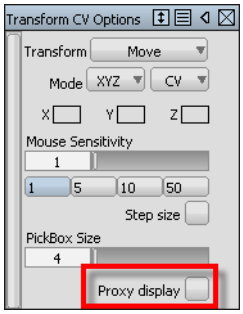
Place tool improvements

Picked construction planes are now locked by default when you select them in the **Transform > Place** tool. To transform a picked construction plane, first click the **Unlock Plane** button.



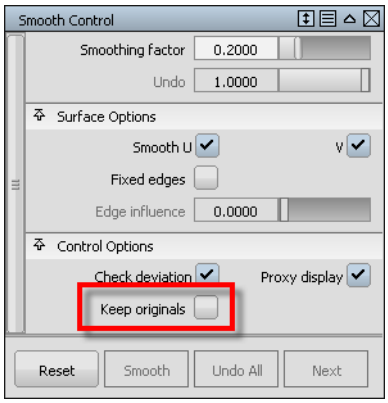
Proxy display in Transform CV tool

Proxy display is now available in the **Transform CV** tool. Select it to display a green proxy of the original hull after the transformation. The proxy helps you visualize how much the surface has changed during the transformation.



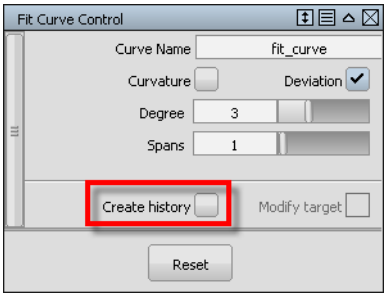
Keep Originals added to the Smooth tool

You can now keep the original surface when you smooth it using **Object Edit > Smooth**.



Fit Curve tool enhancement

We added a **Create History** option to the **Fit Curve** tool. When the option is **not** selected, template curves are not kept when fitting to cross sections, so you do not have to delete them after leaving the tool.


Fit Curve Control
Curve Name
fit_curve
Curvature
Deviation
Degree
3
Spans
1
Create history
Modify target
Reset

Data Transfer

6

Describes changes and new features in data transfer.

Alias data to Autodesk SketchBook

If you have Autodesk SketchBook Pro installed, you can now export your view to SketchBook Pro. Choose **File > Send to SketchBook**.

Alias data to Autodesk VRED

If you have Autodesk VRED installed, you can now export your data from Alias to VRED for rendering. Choose **File > Send to VRED**.

Send to VRED options

Geometry Output Send either **All** geometry or **Selected** geometry to VRED.

Open New Scene Opens a new scene and inserts the Alias geometry into it.

If this option is not selected the Alias geometry is imported into the current scene.

VRED Base CAD Options

Keep Surface Data Keep NURBS data.

Merge Geometries Merge the geometry to be imported to VRED.

Chord Deviation

Set the distance from the midpoint of a tessellated edge to the geometry.

Normal Tolerance

Set the allowed normal deviation between the normals on the ends of a tessellated edge.

Max Chord Length

Set the maximum length of a tessellated edge.

Enable Stitching Enable the stitching of adjacent edges.

Stitching Tolerance

Set the tolerance where two adjacent edges are considered to be touching and where they should be stitched together.

Import and Export ACIS files

You can now open Standard ACIS Text (SAT) files in Alias.

You can also save Alias files as SAT files or Standard ACIS Binary (SAB) files.

To import an SAT file

1. Choose **File > Import**
   
   or **File > Open**
   
   .
2. Set SAT import options and click **Import File** or **Open File**.
3. Choose the file.

To export an SAT file

1. Choose **File > Export > Active As**
   
   or **File > Save As**
   
   .
2. Choose **SAT** as the **File Format**.
3. Set SAT export options and click **Save**.

SAT import options

Logfile Output Creates a log file of the results (`<filename>.alias2sat`).

SAT export options

Logfile Output Creates a log file of the results (`<filename>.sat2alias`).

Export Binary Saves the file as Standard ACIS Binary (SAB).

New CATIA V5 export option to export curves-on-surface

Curves-on-surface are converted to curves on export to CATIA V5. We added the **Export Curve on Surface** option to the CATIA V5 export options to include these files in the CATIA V5 file.

For the AlToC5 command, the equivalent option is `-x`.

Fixed Limitations

7

Lists important customer issues that have been addressed in this release.

General Issues

- If you set your My Documents folder to a network drive, when you selected **File > Open**, Alias interpreted it as a relative path and added a drive letter to it. This has been fixed. Alias no longer fails to recognize a network path as an absolute path.
- When you opened a file that referenced several .wref files, none of the of the reference data loaded if you were missing just one file, or if one of the files had been modified. This has been fixed.
- Clicking outside a window did not dismiss an active cell. This has been fixed.
- When importing files in the Reference Manager, you can now filter by .wref files.
- When using two monitors with Alias on the first monitor, selecting **Layout > Full Screen** no longer moves the Alias window to the second monitor.

Evaluation Issues

- The curvature comb on a trimmed edge is now more accurate.
- The diagnostic shaders no longer share the same transparency value. Each shader now has its own transparency value so that changing transparency for one shader no longer changes it for all shaders.

Modeling Issues

- The **Surface Fillet** tool sometimes created T-connections. This has been fixed.
- The **Symmetric Fillet** tool failed to build in some highly-curved cases. This has been fixed.
- You can now detach a periodic surface at the seam.
- Chain select now works on objects in layers with symmetry on.

- When you have multiple CVs selected and choose the **Proportional Mod** or **Transform CV** tool, the CVs are no longer unselected. A single CV close to the center of the selected CVs remains selected.

- **Skin** tool fixes:

  Chain select now works.

  The surface is now correct when you edit a skinned surface using the range manipulators.

  Skin now uses the original parameterization of curves when building multiple surfaces (with **Explicit Control** off). The result is that the output skin patch matches the input curve.

  The skin is now closed when **Proportional Crown** is on.

  The skin history is no longer lost when there are more than nine V spans.

  Selecting **Continuity Check** no longer hangs the tool.

  Proportional Crown now gives a consistent crown across the entire surface.

  When you increase the **Proportional Crown** value, **G1 Continuity** is no longer broken.

  Changes made to surface flow control using the manipulator handles are now reflected in the Skin Control window.

- In the **Surface Fillet** tool, cylinders were not trimming when **Trim Type** was set to **Automatic**. This has been fixed.

- **Extend** tool fixes:

  You can now snap-extend a surface.

  The surface is no longer duplicated when you extend it with **Chain Select** selected.

- With **Double Sided** on and **Single Surface** off, the surface structure of two sided surfaces created with the **Multi-Surface Draft** tool did not match. This has been fixed. The surfaces now match.

- The toggle label for the **Interior Flow Control** in the **Surface Fillet** and **Symmetric Fillet** tools now only appears when there is an interior boundary to align to. Otherwise, only the **Start** and **End** labels appear.

- When using the **Move Locator** tool, you can now edit multiple deviation locators at the same time.

- The Layer Symmetry Plane manipulator now continues to display until you select **Layer > Set Plane** again.

What's Where...

8

New tools

The tools listed in this section are new in this release of Alias.

- **Transform > Arrays > Surface Array**
- **Curve Edit > Create > Curve Fillet**
- **File > Send to VRED**
- **File > Send to SketchBook**
- **Layers > Random Colors**
- **Help > Desktop Analytics Program**

Obsolete tools

The following tools have been removed, either because they were redundant, or no longer served any useful purpose.

- **Evaluate > Iso Angle**
- **Evaluate > Parting Line**