Version 3.7

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Powered by www.3D-Coat.com

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Applink Connection Plug-Ins!

Totally Revamped Brush Engine!

New Voxel and Surface Mode Brushes.

Crisp Edges in Voxel Room with Boolean Cut off.

Instancing in Voxel Room

Precise Synchronization of Blending Modes with Photoshop

Faster & Improved Paint Room Modes.

New Retopo Room Tools.

More Accurate and Intuitive Automatic Topology.

Totally Customizable Interface (hide or show any button or menu item).

New, User-Friendly Ways to Share 3D-Coat Resources.

See page 71 for a full list of changes.

1.0b What's New in 3D-Coat 3.5?

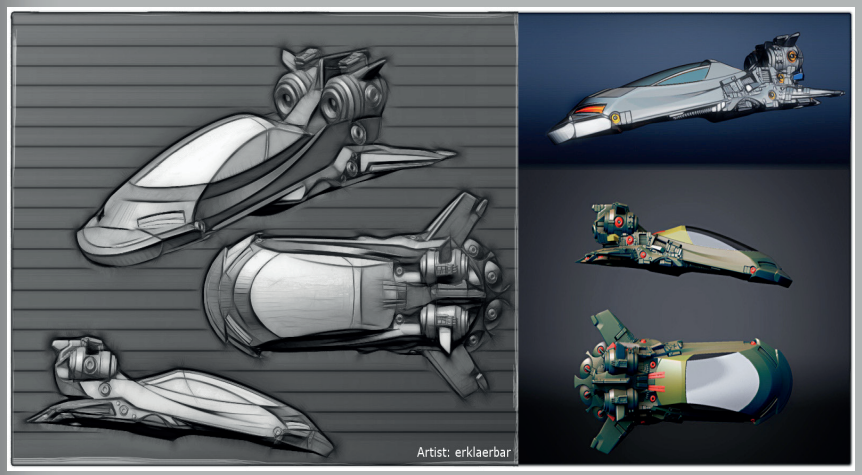
Completely re-engineered brush engine for super smooth and fast sculpting and painting.

Create topology automatically with AUTOPO.

Create and edit multiple UV sets.

Save individual voxel layers as separate .3b files.

Multi-resolution and & caching voxel tools! Sculpt and make changes on your low resolution sculpture and the changes are automatically transferred to the high resolution version.



Multi-threaded merging! Any merging operation, (moving voxel objects between surface mode and voxel mode, move/pose tools), is now multi-threaded, speeding up sculpting operations and workflow.

Color sampling via the clipboard allows the selection of colors from Photoshop or user defined reference images.

GTX 400 series video card support.

Improved support of Ptex to Renderman.

Custom resolution via Ptex.

Improved visual spline preset viewer.

Create and upload turntables automatically.

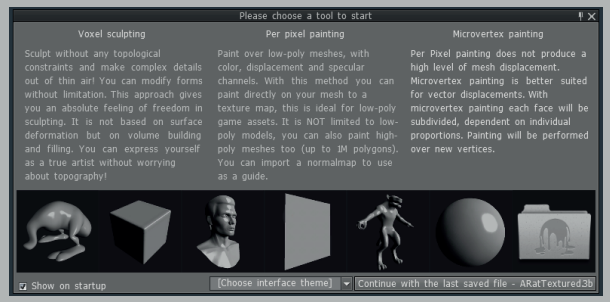
Paint over disconnected objects.

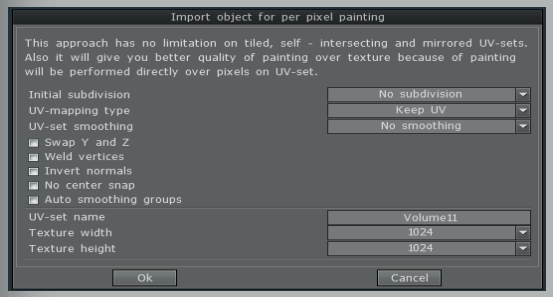
Many bug fixes and work flow improvements!

Getting Started

2.1 Importing Meshes

With the middle column selected, pick one of these ***.obj*** files that you can see in the menu from the opening wizard. Or, select the ***File*** menu and click on ***File/Import/Model for per pixel painting***. Then, choose the ***"sample.obj"*** file, (it's in the ***Samples*** folder).





Upon importing an object you will be prompted with the dialog (left):

Initial subdivision: This number implies several automatic mesh assignments for painting with added smoothness. A high poly mesh and a mid-poly mesh are automatically created, with the mid-poly mesh displayed in the viewport. Increase this number for added smoothness.

UV mapping type: By default, the UV-mapping type is ***Keep UV***. Checking this option implies that you have a pre-existing UV mapped mesh, and, upon import, it will remain the same. But, you can change it if desired. For this example we'll leave it as it is.

Uv set smoothing: This option works only if you have chosen to subdivide the model during import.

Auto smoothing groups: This option creates smoothing groups automatically. By specifying a value in the ***Maximum angle*** field, it becomes necessary to check this option.

UV-set name: Enter the desired name for the UV-set.

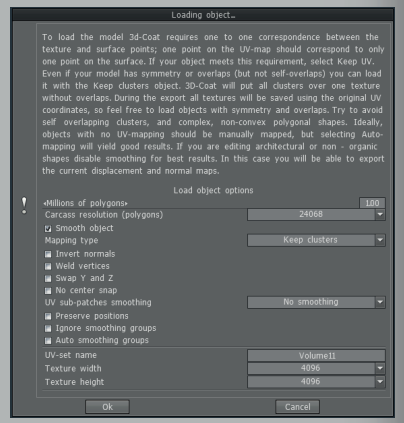
Texture width: Set the width of the texture.

Texture height: Set the height of the texture.

NOTE: If your video card has less than 256 mb of RAM, you should avoid textures larger than 2000 x 2000 pixels.

Micro-vertex Painting

If you choose ***File/Import/Model for micro-vertex painting***, and you have selected a file - (we recommend to start with ***"sample.obj"*** in the ***Samples*** folder). As with the previous method, you will see a number of options which you can specify upon importing your object.



Millions of polygons: This number represents the number of polygons that 3D-Coat creates automatically, and which it uses internally to provide smoothing and normal map resolution and production. This number should always be larger than the number of pixels in your texture map.

Carcass resolution (polygons): 3D-Coat's internal mesh conversion is comprised of 2 levels of detail for 2 different purposes: the carcass mesh has a mid level of detail, (which is for viewport display), and a high poly mesh, which is used to produce a normal map, on the fly. Adjust this number to allow for the detail you anticipate you will apply to your model.

Smooth object: Check this box to add additional smoothing upon importing your model. For this example, let's check this box.

UV mapping type: By default, the UV-mapping type is ***Keep UV***. Checking this option implies that you have a pre-existing UV mapped mesh, and, upon import, it will remain the same. But, you can change it if desired. For this example we'll leave it as it is.

UV sub-patch smoothing: This option allows you to smooth the sub-patches of your UV map, if you have any.

Pressure positions: This option specifies that the initial vertex positions be saved, thus compensating for a shift which occurs when smoothing with extra stylus pressure.

Ignore smoothing groups: This option imports a model without its associated normal map. The model will be smoothed automatically.

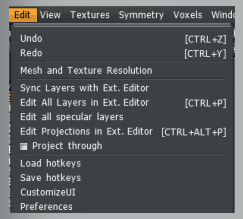
Invert normals: Inverts the normals of your imported model.

Auto smoothing groups: This option creates smoothing groups automatically. By specifying a value in the ***Maximum angle*** field, it becomes necessary to check this option.

UV set name, ***Width*** *and* ***Height*** *function the same as described above.*

2.2 Customizable Interface

Like many other applications, 3D-Coat lets you customize your workspace to suit your needs. You can hide or show windows, move tabbed popup windows around and even dock/undock them, or turn them into floating windows.



If you don't need or want to see a particular window, simply close it. You can always restore it to the interface through the Windows menu , at any time. Customizing your workspace makes 3D-Coat work for you in the way which best suits your needs and workflow. Using the "Customize UI" option from the "Edit" menu allows you to hide or show any menu or interface item.

2.3 Tabbed Popup Panels

The video below starts by moving tabbed popup windows around. We will discuss how to undock and dock tabbed windows and how to create floating windows. Tabbed windows are flexible in that you can change their width and length and also their location. This can be helpful if you're using 3D-Coat on a notebook computer with limited screen space available. **WATCH VIDEO**

2.4 Pop-Up Panel Menus

Many ***Panels*** in 3D-Coat have a small ***down-arrow icon*** in their upper right hand corner. Clicking and holding on this icon reveals the Tab-specific options available.

For example: suppose that you would rather view your brush alpha icons at a smaller size - simply click on the ***down-arrow icon*** and select the ***Tiny*** option.

2.5 Navigation Panel

The Navigation panel is located on the top right corner of the viewport. This panel gives you access to the viewport navigation functions, all of the Camera settings and focus functions and viewport light positioning and intensity settings. From left to right, these are the functions of each icon:

Ambient light intensity: Dragging with the left mouse button, right or left increases or decreases the scene's ambient light property.

Primary light intensity: Dragging with the left mouse button, right or left increases or decreases the intensity of the primary scene light.

Primary light direction: Dragging with the left mouse button adjusts the position of the primary light in 3D space.

Rotate the view: Dragging with the left mouse button adjusts the user view by rotating the main camera around object in focus.

Pan the view: Dragging with the left mouse button adjusts the user view by moving the main camera right, left, up and down.

Zoom the view: Dragging with the left mouse button right or left moves the main camera closer or farther away from the object in focus

Vary the field of view: **RMB** to reset it to default.

Frame object: Fills the view using the object's bounding box.

Focus on brush: Zooms the view to the area the brush is hovering over.

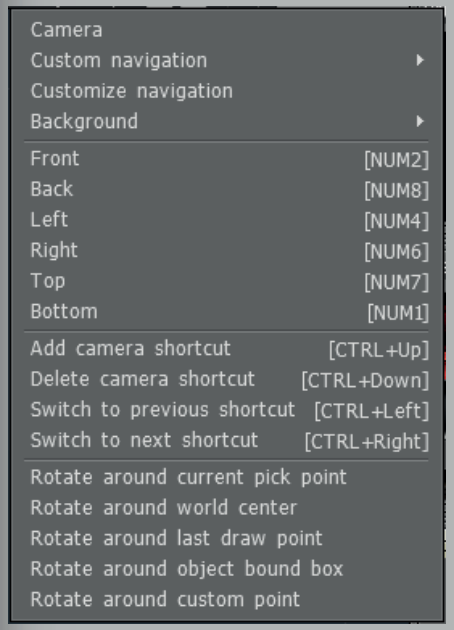
Set camera to default position.

Toggle perspective/orthographic projection.

2.6 Camera Options

Camera

Custom navigation: Choose between 3 styles of navigation - ***3D-Coat, Maya*** *or* ***Zbrush*** style. Using the default, 3D-Coat style, view rotation is controlled with ***LMB-drag***, view panning with ***MMB-drag*** and view zooming with ***RMB-drag.*** When using certain tools and when wanting to retain the current mouse position, simply hold down the ***Alt*** key and use the same mouse buttons as defined above. Hold down "**Shift**" to snap to a regular axis.



Customize navigation: Opens a panel that allows total customization of all navigation commands.

Background: A set of options that lets you set a variety of view backgrounds as visual references.

Add camera shortcut: Stores camera positions and current material settings for rendering fly-throughs and sequences. The other choices let you delete and switch these stored camera positions.

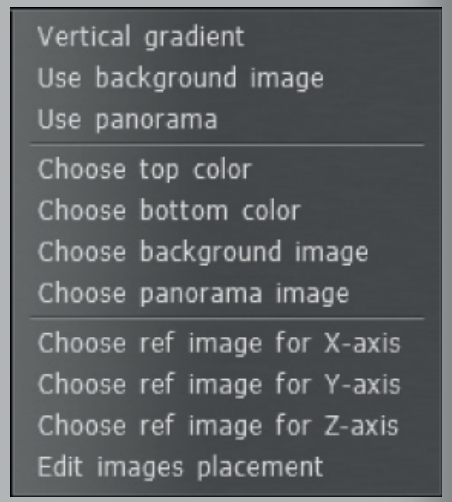
Rotate . . . These commands set the pivot point for the view camera.

2.7 Setting Up Backgrounds and Reference Images

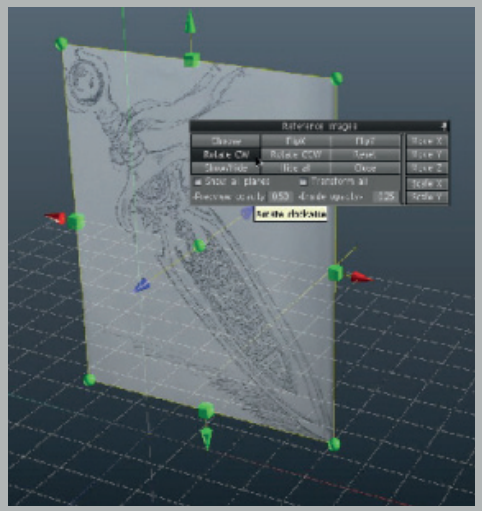
There are 2 different kinds of ***Backgrounds***: those which simply fill the background of the 3D viewport, (and stretch to fill, if needed) - and those that are set up manually for use as sculpting or painting reference images.

Viewport Background: Select ***Use background image*** and choose your image from the opening dialog. The default image is a starfield.

Reference Images: The 3 bottom choices allow you to pick 3 separate images - 1 for each view axis, ***X,Y and Z***.

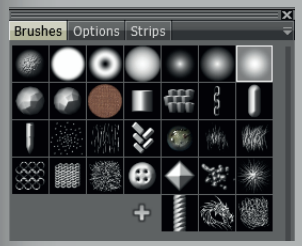


Edit image placement: When selected, this option provides each image plane on each axis with a Transform widget and accompanying dialog settings for adjusting its position, scaling, rotation and view opacity.



3.0 Right Side Panels

3.1 Brushes Panel



These images represent what other programs call ***"Alphas".*** They can be made as free-form grayscale images, using a paint program, or as an actual 3D object that has been converted to a grayscale image, internally, in 3D-Coat.

Adding Brushes: You can add your own brush alphas in the following formats: ***.tga, .psd, .png, .jpg, .tif, .bmp, .abr, .mclp***, as well as the 3D formats ***.obj*** and ***.lwo***. Choosing to load brushes in the two 3D formats opens a dialog that lets you rotate, scale and set the resolution for translation into the Brush format. To add a new brush alpha, simply press the **+** icon and choose the file you want to add.

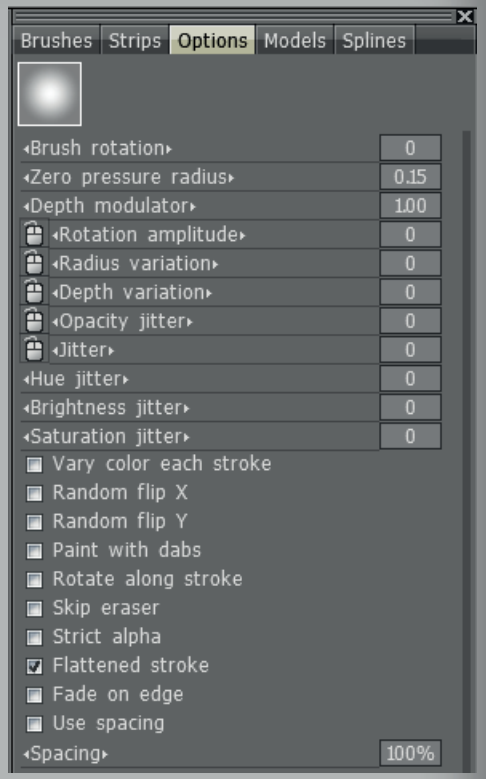
Painting & Sculpting with Brushes: You can begin painting or sculpting by selecting one or many brushes from the Brush panel. More than one alpha shape can be selected by holding down ***Ctrl*** or ***Shift*** and making multiple selections from the panel. Selecting multiple brush alphas enables the program to use them randomly as you paint or sculpt.

Resizing and setting Brush depth: Brush size can be altered by holding down the ***RMB*** and dragging left or right ion the working object. The keyboard can also be used to set the brush size - just use either the "**[**" or the "**]**" keys.

Painting or sculpting with depth can be adjusted by dragging up or down with the ***RMB*** depressed. Alternately pressing the "**+**" or the "**-**" key on the keyboard achieves the same thing.

3.2 Brush Options & Settings

Brush Toolbar Settings: Just above the viewport you can find the Brush toolbar which provides settings for the most commonly used brush settings. Both radius and depth of the brush can be set here, as well as whether these settings are affected by ***tablet stylus pressure***.



Brush Options Panel: At the top of the panel is a preview of the Brush alpha shape followed by a series of behavior controls.

Brush rotation: This sets the initial orientation of the alpha at the beginning of the stroke.

Zero pressure radius: When using a tablet stylus, this number indicates the default radius at the beginning of the brush stroke.

Depth modulator: The default depth for each brush being used.

Rotation amplitude: Sets the amplitude for additional brush rotation.

Radius variation: Sets the percentage of random brush radius variation.

Depth variation: Sets the percentage of random brush depth.

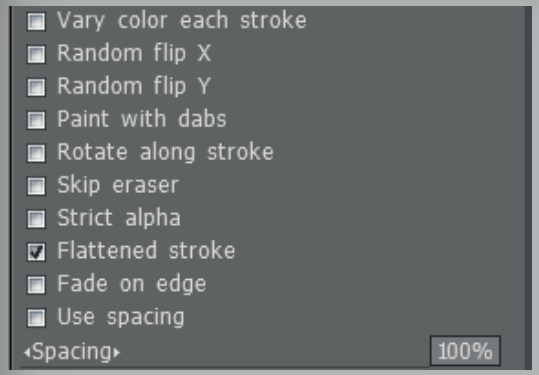
Opacity jitter: Defines the randomness of the brush opacity setting.

Jitter: The overall randomness of brush behavior.

Hue jitter: Defines the randomness of the brush hue when used for painting color.

Brightness jitter: Varies the brightness, randomly, over the course of a stroke.

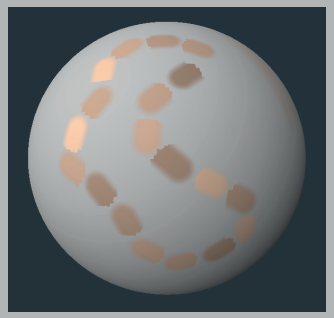
Saturation jitter: Varies the saturation of the primary color, randomly, over the course of the stroke.

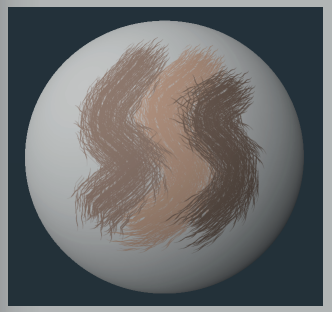


Vary color each stroke: Use this option to produce painting effects, like fur or hair, when you need to either vary the ***Hue/Saturation/Brightness*** as you paint a single stroke, (variegated strand color), or when you want each stroke made to have a slightly different ***Hue/Saturation/Brightness*** - as determined by the corresponding "***Jitter***" setting.

Random flip (x, y): This randomly flips the selected brush either across its x or y axis while painting.

Paint with dabs: Creates paint or sculpting "dabs" which occur at some set spacing - as determined by the "***Spacing***" control.





Rotate along stroke: When using brush alpha shapes that you want to align like the bristles of a brush - so that they change direction as the brush changes direction, all along the stroke - use this option.

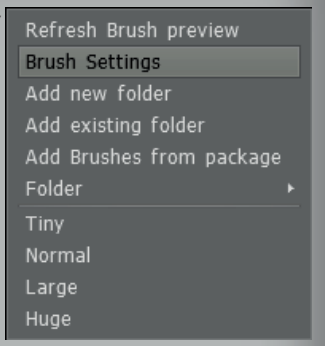
Skip eraser: Disables the "***eraser layer***" of the brush.

Strict alpha: Use this setting to cause both sculpting and painting brushes to strictly adhere to the shape defined by the brush alpha.

Flattened stroke: Use this brush setting to mimic Photoshop brushes for improved stroke overlapping with a truncated alpha shape.

Fade on edge: All strokes painted with this option checked will have a smoother edge transition.

Use spacing: When used with the ***"Paint with dabs"*** option, adjusting the ***"Spacing"*** percentage slider determines how close or far apart the paint dabs are applied.



Advanced Brush Settings Panel

Refresh brush preview: Refreshes the Brush alpha icon.

Brush Settings: Opens the ***"Brush Options"*** panel.

Add new folder: Allows you to choose a pre-defined folder of Brush alpha shapes to be added to the ***"Folder"*** list.

Add existing folder: Allows you to choose a single Brush alpha from a folder, thus adding all the alphas in the folder to be included in the folder, now with the name of the chosen file, which is then listed in the ***"Folder"*** selection list.

Add Brushes from package: Adds Brush alphas that have been packaged into a ***"penpack"*** file format.

Folder: A selection list of all folders you have enabled 3D-Coat to access. The icons from this chosen folder will then be visible in the ***"Brushes"*** panel.

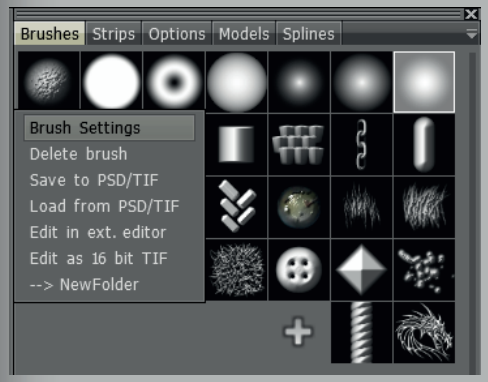
Tiny: Sets the Brush alpha icon set to a very small size.

Normal: Sets the Brush alpha icon set to the default size as seen when the program opens for the first time.

Large: Sets the Brush alpha icon set to a size larger than the default size.

Huge: Well, you can guess the size of these - (better try it out and see).

3.3 Brush Alpha Edit Menu (Right-Click)



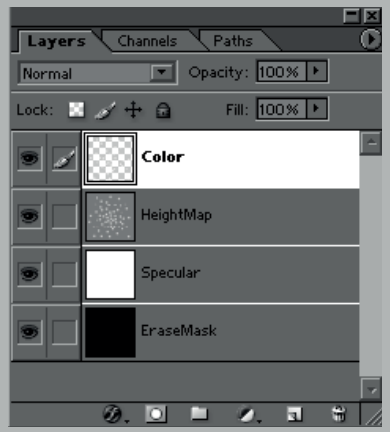
Right clicking on any unselected Brush alpha invokes a comprehensive list of alpha editing functions.

Brush Settings: Opens the "***Brush Options***" panel.

Delete brush: Deletes the selected Brush alpha.

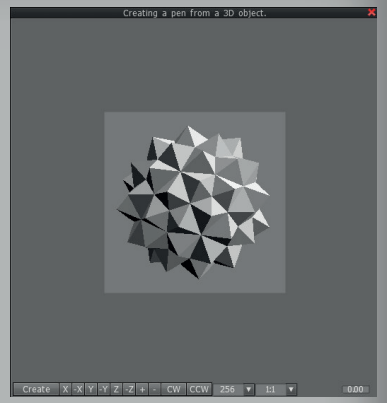
Save to PSD/TIF: Saves the selected Brush alpha to either file format. ***.PSD*** is more intuitive, while ***.TIF*** is more precise, giving you more channels to save and manupulate elsewhere. ***.TIF*** can contain 7 channels - ***RGB***, ***alpha***, ***height***, ***specular*** and the "***Erase mask***".

Load from PSD/TIF: This replaces the alpha that has been ***right-clicked*** on with an of your choice, save in either the ***.psd*** or ***.tif*** formats. To create a brush in a 2D painting application, you must have 4 layers each corresponding with the 4 main channels of a brush in 3DC, they are: ***Color, Height Map, Specular*** and ***Erase Mask.***



If all the ***.tif*** channels are used, they will all be imported and used according to the table below. If you only use some of the available channels, those you do import will also be used according to the table below.

- **1 CH: A&H**
- **2 CH: 1 – A 2 –H**
- **3 CH: 1, 2, 3 – RGB, 2 – A, H**
- **4 CH: 1, 2, 3 – RGB, 4 – A, H**
- **5 CH: 1, 2, 3 – RGB, 4 – A, 5 – H**
- **6 CH: 1, 2, 3 – RGB, 4 – A, 5 – H, 6 – Spec**
- **7 CH: 1, 2, 3 – RGB, 4 – A, 5 – H, 6 – Spec, 7 – Erase mask**



Edit in external editor: Creates a "live" connection between 3D-Coat and the external editor you have specified in the "***Preferences***" section. The default editor is ***Photoshop***. Selecting this option opens the specified editor and any changes that you make and save from the editor are automatically loaded back into 3D-Coat.

Each brush includes 4 Layers: In 3D-Coat, the ***Layers*** that are imported and used arrange themselves into ***Color***, ***HeightMap***, ***Specular*** and ***EraseMask***. The order of these Layers, in the external editor, are important. Looking at each of these individually:

Color: This contains the Brush color as well as its corresponding ***Transparency mask***. This mask affects the ***Specular Layer***, as well.

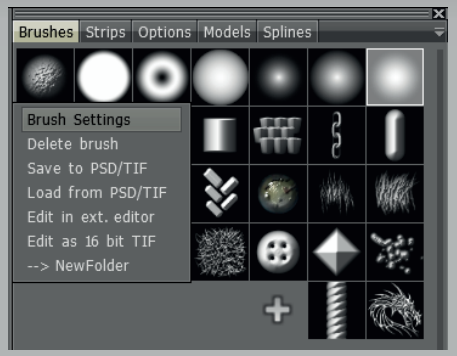
HeightMap: ***Depth*** is synonymous with this definition. The "***zero***" height of this ***Layer*** corresponds to "***middle gray***" or (***127, 127, 127***). ***Darker*** values correspond to concave area and ***lighter*** values correspond to convex areas.

Specular: White represents maximum specularity. Black represents absolutely no specularity, with shades of gray representing intermediate values. The ***Color Layer*** mask also interacts with this Layer.

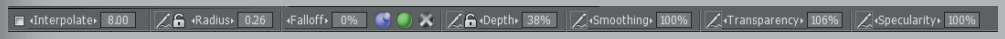
EraseMask: This ***Layer*** is used to create Brush alphas that ignore certain values, in other layers, while painting. Remember that this mask affects the ***lowest Layer*** in the list.

Edit as 16 bit .TIF: This allows you to save in ***16 bit*** format, rather than ***8 bit***. Using this option causes the Brush alpha to be saved as a ***.psd*** file, allowing it to be reloaded automatically, each time it is edited and saved in the external editor.

NewFolder, (etc.): This option will allow you to copy the Brush alpha, (that you right-click on), to a folder named in the "***Folder List***" that you have previously defined. All the "***New folder***" names you have defined will appear here.



3.5 Brush Options Tool Bar



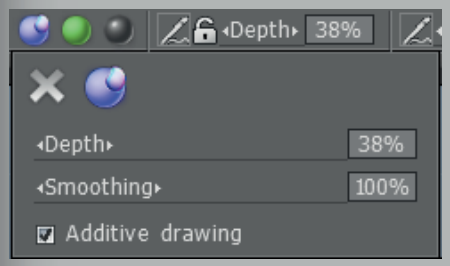
The most commonly used Brush settings appear in this tool bar. Different Brush types require different options, so these fields and sliders change, depending on which Brushes you are currently using. Also, these fields and sliders change, depending on which ***Room*** you are currently working in.

Paint Room

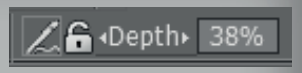
Interpolate: Sets the intensity of Brush stroke smoothness - simulating a smoothed ***spline based*** stroke. Uncheck this if you want no additional stroke smoothing.

Radius: Sets the diameter of the Brush "***tip***". You may toggle between using ***Stylus pressure*** to influence this setting or not, by clicking the ***Brush/Mouse toggle***. Press the "***Lock***" icon to set the diameter to a constant value, preventing further adjustment.

Falloff: Controls the softness of the Brush stroke "***edge***" , by adjusting it with a "***falloff curve***".

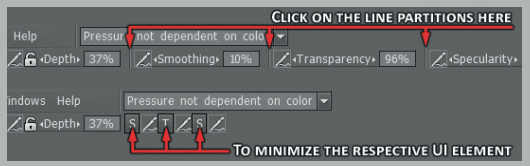


Depth, Color, Specularity Buttons: When no "***X***" covers each of these icons, you have ***enabled*** painting with some or all of these ***channels***. The "***X***" ***disables*** some or all of these same ***channels***. Hovering the cursor over each of these causes a menu to appear that contains brush stroke options. The shortcuts for obtaining these menus are, "***D***", "***C***" and "***S***".



Mouse, Pen and Lock Icons: These two icons indicate what mode you are painting in. You can toggle from one to the other simply by ***LMB clicking*** on the icon. The ***Mouse icon*** locks pen pressure to whatever value you have in the respective setting the icon is next to. ***The Pen icon*** allows for pen pressure directly from your stylus. The ***Lock icon*** will lock the "on screen" size of the Brush. It is convenient when you want to change radius of the pen by simply moving the model backward and forward in space. The ***Lock icon*** near depth slider lets you vary the pen radius without variation of absolute pen depth. In standard mode, ***radius*** and ***depth*** are proportional.

Minimizing on the Tool Bar: You can also change settings on the tool bar, such as ***falloff***, ***specularity***, etc. This can be done by clicking in the immediate area around the setting you wish to minimize. The image here shows the area to click to achieve this.



Depth: Manually adjusts the ***alpha depth*** of the current Brush. Use the ***Brush/Mouse toggle*** to enable or disable ***stylus pressure*** influence. The "***Lock***" icon keeps depth constant and prevents changes.

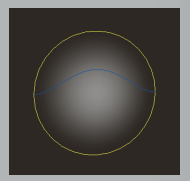
Smoothing: Adjusts the Brush alpha smoothing. Use the slider or enter values in the corresponding field.

Transparency: Adjusts the Brush alpha transparency.

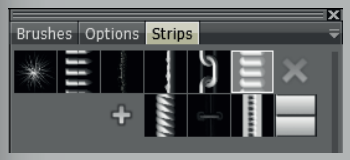
Specularity: Adjusts the Brush alpha specular value.

Mouse & Stylus Shortcuts

Brush ***Radius*** and ***Depth*** can be adjusted, on the fly, by holding down the ***RMB*** and dragging left or right, (for Radius) - and dragging up or down, (for Depth) of stroke, in the viewport. The brush cursor will automatically reflect these changes.



3.6 The Strips Panel



The Strips panel offers an alternate selection of Brush tips, which repeat over the length of a stroke. Choosing a Strip shape overrides the ***alpha*** shapes in the ***Brushes panel***. Strips work best in the ***Paint Room*** for creating detail with normal map depth, in concert with ***per-pixel*** painting modes, or, for actual displacement painting while using the ***micro-vertex*** method.

In this illustration, the bandolier was created with a standard Strip shape, totally within the ***Paint Room*** - using the micro-vertex method of painting.

For similar functionality in the ***Voxel Room***, use the "***Curves***" tool with a repeating Spline shape selected from the "***Splines***" panel. The Strips panel uses the same methods of adding folders and individual strips as the Brushes panel.

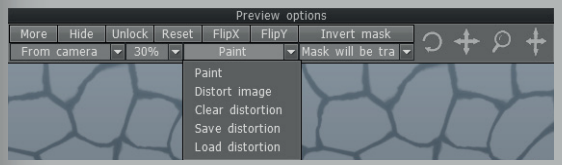
3.7 The Masks Panel

Masks are used as a way to specify an area for sculpting or texture painting with Brush depth and transparency. Masks are essentially stencils.

The mask, in conjunction with materials can be moved and rotated independently using the new navigation controls. Masks and materials, both, can also be rotated precisely 45 degrees by using SHIFT key.

If you choose to display mask/ material in at least one of the channels (Depth and/or, Color and/or Specular), a new panel shows up on top.

Mask/Material Preview Panel: With the Preview Options panel you can adjust the Masks & Material preview parameters as follows:



Hide/Show/Auto: Hide/show/auto-hide full-screen view of texture. You can switch mode with the hot key "H".

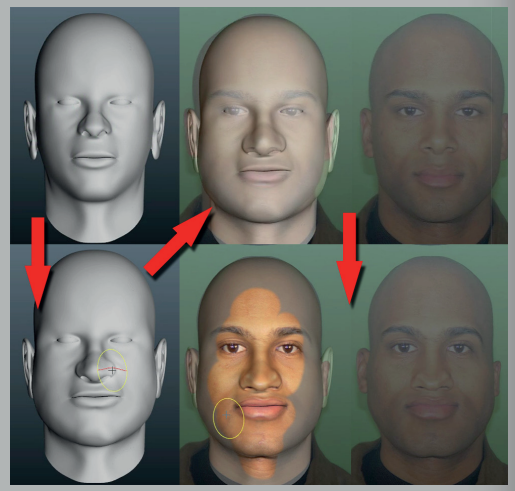
Unlock/Lock: Lets you scale and texture automatically while scaling and moving the model.

Flip X: Reflect mask image, mirror-like, across the horizontal axis.

Flip Y: Reflect mask image, mirror-like, across the vertical axis.

Paint: This mode lets you paint, using your mask or material.

Distort Image: In this mode you can distort your mask or material directly with your brush. You can do some very unique texture work with this feature. It is great when you have an image that doesn't match the mesh exactly. You can then use this tool to shape the image to match the mesh more precisely – so that you can then paint with a material or mask. As you can see in the image, the jaw line, nose and silhouette of the head have been shaped with the distort image feature.



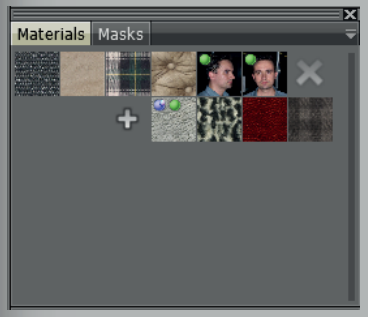
Reset: Places the texture in its initial position.

Clear/Save/Load Distortion: With these options you can clear, save and load your distortions.

Mapping Method: There are two methods you can use here. From Camera and Cube Mapping. From Camera lets you project the method through the viewport. If the Cube Mapping application type is selected, the material preview will be displayed on the pen only, as opposed to full screen (when ***From camera*** is selected). On the right there is a slider responsible for transparency when viewing the Masks/material.

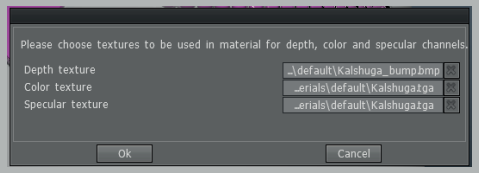
Opacity of preview: Percentile based opacity controls.
Adding a new mask or material is done exactly as you do with ***Brushes*** and ***Strips***.

3.8 The Materials Panel

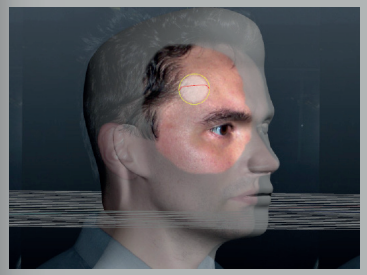


The Materials Panel contains thumbnails of each of your chosen Materials, as separated and defined in your various ***Material folders***. Individual Materials can be added to the open folder display with the "+" icon.

Right-clicking on a Material opens a dialog that lets you assign a separate texture image to each of 3 channels: ***Depth***, ***Color, (or Diffuse)*** and ***Specular***. You can choose to use ***all*** or ***some*** of these channels to define each Material.



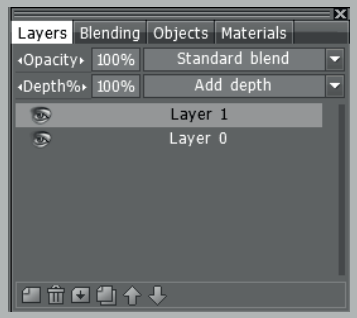
Left-clicking on a Material thumbnail will tile the Material image across the whole screen. Left-clicking the grey ***"X" disables*** the use of all materials and removes the material preview from the Viewport. Pressing ***"M"*** on your keyboard opens a new ***Materials panel***.



In the example on the left, we only want to paint with a ***Color*** texture on the model, so ***Depth*** and ***Specular*** channels are disabled. You can enable or disable any or all channels, as needed.

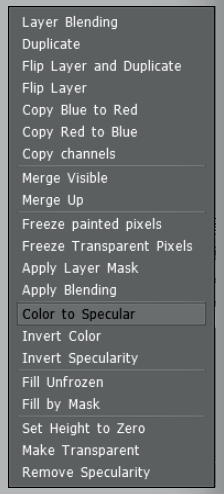
All of the controls for masks, as detailed in that section, are exactly the same as for Materials. You can see the power of using Materials in the picture below.

3.9 The Layers Panel



The Layers Panel changes depending on which ***Room*** you are working in. In the ***Paint Room***, Layers are used much like you would in Photoshop or other painting applications, where aspects of each Layer can be controlled independently, such as ***blending modes*** and ***opacity*** - but with additional control over how ***Depth*** painting affects the Layer in question.

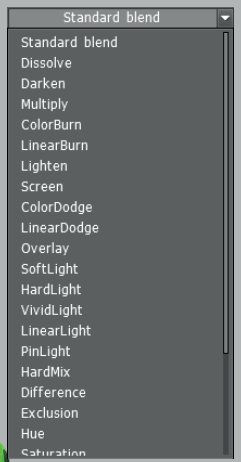
Right-clicking on a Layer name opens a menu of addition commands. Icons at the bottom of the panel are, in order, for the following functions: ***New Layer***, ***Delete Layer***, ***Merge Layer downward***, ***Move Layer up***, ***Move Layer down***, (in the list).



Layer visibility: Simply toggle the "Eye" icon to hide or show the Layer in question.
Hold down the "**Alt**" key to hide every layer except the layer clicked on.

Layer Blending: Go to the Blending tab.

Duplicate: Duplicate the selected Layer.

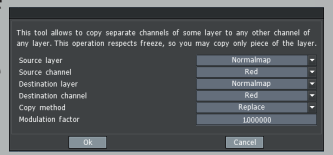


Flip Layer and Duplicate and flip: Duplicate the Layer and flip it, using topological symmetry.

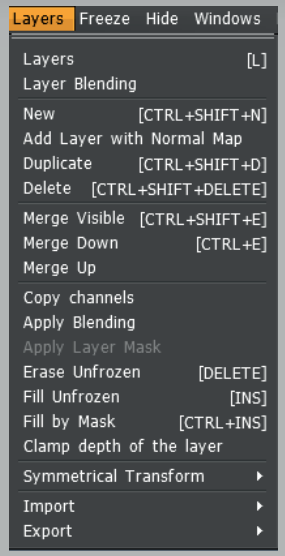
Flip Layer: Flip the Layer using topological symmetry.

Copy Blue to Re: Copy the blue part of a mesh to the red part. You can define blue and red parts in the topological symmetry tool.

Copy Red to Blue: Copy the red part of a mesh to the blue one. You can define the



blue and red parts in the topological symmetry tool.



Copy Channels:

Merge Visible: Merges all visible Layers. "Undo" is unavailable.
Merge Up. Merge this Layer and the upper Layer. "Undo" is not available.

Freeze painted pixels: The freeze value will be set equal to the Layer's transparency.

Freeze Transparent Pixels: Freeze the transparent part of the Layer. It is important if you want use the transparency mask of the current Layer on another Layer. Use **CTRL**+**LMB** on the Layer to perform the same action.

Apply Layer Mask: Apply a Layer mask to Layer. The Layer mask is a reference to another Layer that masks this Layer.

Apply Blending:

Color to Specular: Transforms color brightness to the specular channel.

Invert Color: Inverts the color of this Layer.

Invert Specularity: Inverts the specularity of this Layer:

Fill Unfrozen: Fills the unfrozen parts of the Layer with the current color and specularity.

Fill by Mask: Fills the Layer with the current color and specular using its current transparency mask.

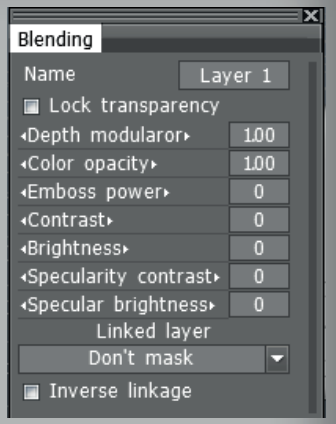
Clamp depth of the layer:

Set Height to Zero: Sets the height to Zero on all the Layers.

Make Transparent: The Layer will become fully transparent.

Remove Specularity: The specular channel will be set to Zero.

4.0 The Blending Panel



This panel contains a more advanced set of parameters. Let's take a look:

Lock transparency: This lets you draw on a Layer without changing its transparency. Essentially, it lets you edit the current colors on a Layer without adding more.

Depth modulator:

Color opacity:

Emboss power:

Contrast:

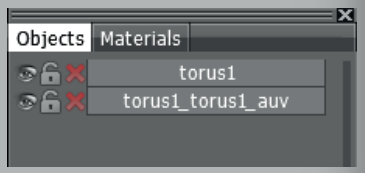
Brightness:

Specular contrast:

Specular brightness:

Linked Layer: This drop-down list enables you to mask the current Layer with another Layer. The transparency and depth of the current Layer will be modulated by the selected Layer transparency.
Inverse linkage. An inverse Layer opacity will be used as a mask.

4.1 The Sub-objects/Materials Panel



This tab displays all imported meshes into a Layer system. Essentially, each Layer is an object, and can be toggled on/off for a number of things, like its visibility or locked/unlocked

5.0 The Painting Modes

Throughout the development of 3D-Coat, new painting methods and modes have been developed that have been designed to meet different texture import and export needs.

As of version 3.5, three modes are supported: Micro-Vertex, Per-Pixel and Ptex. It can be confusing which one to use and for what it is best suited. A general overview of the 3 modes can help in this decision:

Use Per-Pixel mode for both high resolution models and low resolution models, where you need maximum compatibility with other environments and where extreme clarity of texture is required. Note that Depth painting within this mode only supports the real time generation of a normal map, rather than actual painted displacement - but, based on this information, a displacement map can be exported as well as a normal map.

Use Micro-Vertex mode when you desire to add high frequency, actual displacement while painting in the Paint Room. The exported textures, however, will not be as clear as those exported from Per-Pixel mode. This mode is less responsive, in real time, than Per-Pixel mode.

Use Ptex mode when you intend to create super high resolution texture maps that can be used with applications that read Ptex format, or which have been tested to work well with 3D-Coat converted Ptex UV maps. Also, texturing using Ptex is an ideal way to get the highest texture detail for use in baking to an object with a similar or same shape, but having an entirely different UV map or level of subdivision. See the Texture Baking Panel.

With the microvertex approach every face, (quad only allowed), was represented as a patch N×M vertices (N and M could be different for every face). Every vertex had color and coordinates in space, so every kind of displacement was allowed. However this approach was limited because it was very difficult to edit meshes with non-quad faces, and projecting a patch to texture resulted in a loss of quality, so it was difficult to import a texture, edit it and then export because the after-export texture appeared to be slightly blurred. So we decided to implement **Per-Pixel Painting**. Here are the basic points of this technology:

- Painting is performed not over vertices but over pixels on the texture directly. It looks like every pixel on the texture is represented as a point in space.
- Every pixel contains any number of Layers of color, opacity, normal displacement and specularity.
- Every Layer can be blended with the previous one using well-known blending operations for color and displacement.
- Every texture point in space has its neighbors in a per-pixel representation. It is important because it lets you not only paint over the model but also to perform non-local operations – like blurring and sharpening with brush.
- Some operations are performed in space, like painting, filling, applying curves, some in projection, like smudge. All this is transparent to the user.
- Most operations can be performed (optionally) not only on the visible side of an object but on the invisible too, like applying curves, filling, painting rings, rectangles and polygons over the surface.
- Exchange with other applications becomes really fast and has no quality loss, so you can use ***3D-Coat*** in any stage of the pipeline for a final touch or to perform full texturing.
- You can import a normal map and use it as a reference for texture painting. Normal maps can be changed too, you can apply some smoothing (not over seams) or fade some areas.
- It creates seamless painting and smoothing over textures.

Per-Pixel painting has only one disadvantage when compared to Micro-Vertex painting: per-pixel painting does not support ***vector displacement***, only ***normal displacement***. Sometimes this functionality difference is important, so we left both approaches as options.

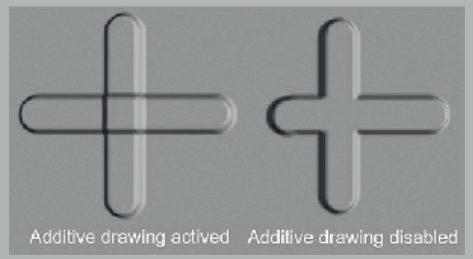
For example, using the Micro-Vertex approach to paint on ***baked*** voxel sculptures gives you better results. ***Additional advantages*** of per pixel painting are as follows:

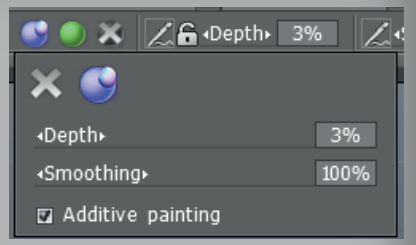
- The ability to affect pixels on the back of the model, (filling, blurring and applying overall effects.)
- The painting quality does not depend on the distance from the object to the camera.
- More precise painting: what you see is what you get.
- The key advantage over Micro-Vertex painting is the ability to blur pixels underneath the brush. This is possible because every pixel has a neighbor toward which it can be blurred.

5.1 Painting With Depth 

Painting, in 3D-Coat, can take place in up to ***3 "channels"*** at the same time - ***Depth, Color*** *and* ***Specular***. Enable or disable whichever channels you wish to use, simply by clicking on the corresponding icon in the top tool bar.

Hovering the mouse pointer over each of these icons brings up an ***additional menu*** of options. The ***Additive painting*** option is best illustrated in the diagram to the right. When not enabled, crossing brush strokes plateau at the same level of depth - when enabled, the same strokes will cause paint to "pile up" wherever the strokes intersect. Also, if the option is disabled, the overlapping behavior is applied only on strokes drawn in the current Layer.





The depth of your painted stroke can be controlled, ***"on the fly"***, simply by holding the Right mouse button down and dragging up or down. The ***depth intensity*** is visually indicated by the center colored and contoured line within the painting cursor, (red by default). The shape of this center contour reflects the shape of the Alpha you have selected in the primary Brush Panel.

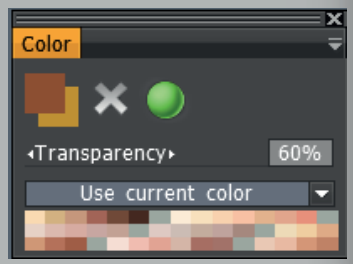
Depth intensity can also be controlled with the keyboard by pressing either the "+" or the "-" key, or by rolling the mouse scroll wheel forward or backward. When using a stylus, use less pressure to avoid stroke "***overdrive***".

NOTE: When painting in the Micro-Vertex mode, and your mesh is low resolution, painting with high depth intensities may cause abrupt mesh distortion.

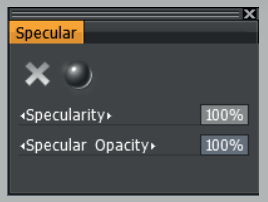
Smoothing of your painted depth stroke can be adjusted by using the "Smoothing" slider in the top Brush tool bar or by holding down the "Shift" key and the Right mouse button and dragging up or down. The ***keyboard shortcut*** for this function is either "Shift +" or "Shift -". The center brush profile line becomes green, by default, when you are in Smoothing mode.

5.2 Painting with Color 

When no material is selected, you can paint with basic color or randomly with the 2 colors chosen from the main Color Swatches. You can also paint with a random Blend of colors, chosen between those 2 swatches. Invoke the Color Pop-up with the "C" key, where all of these modes are available.

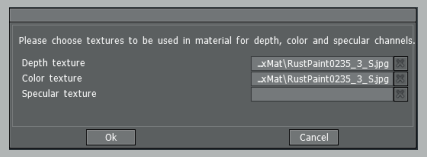


5.3 Painting With Specular

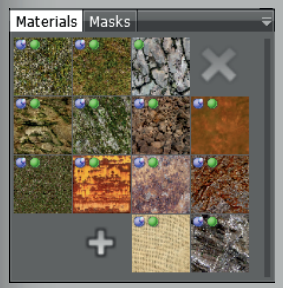


The degree of shininess that you wish to paint with, for Alpha Controlled application, or for Specular mapping contained in a Material, is adjusted with this Pop-up panel. Use these functions to turn off Specular painting, to adjust the intensity of the effect, or to add a Blending amount to your Specular map or "flat" Specular application, when no map is found. Press "R" on your keyboard to bring this panel to the front.

5.4 Painting With Materials

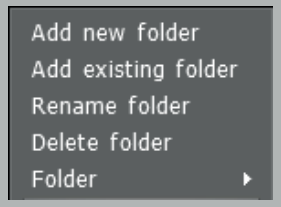


All 3 Paint Channels, when enabled, will react with any ***Material*** that is currently selected from the Materials Panel. Every Material can contain a separate ***texture*** for each of its channels - ***Color, Depth*** and ***Specular.*** If no Material is selected, (***disable*** the use of Materials by clicking the large "X" in the ***Materials Panel***), then each ***Paint Channel*** will respond based upon which ***Brush Alpha*** has been selected .



New Materials can be added to an existing Material Folder simply by clicking on the large "+" icon in the Material Panel. The thumbnail image of each new material is created based upon which texture image you select for that Material's "***Color***" channel.

New Material Folders can be created or loaded by pressing the small "***Down Arrow***" at the top right of the Material Panel and selecting either the "***Add new folder***" or "***Add existing folder***" options.



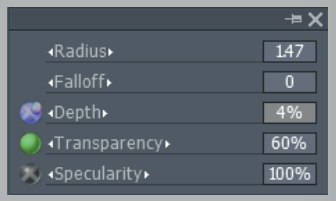
Painting Shortcuts

Some artists like to paint and texture with as much "blank" screen space as they can get. They dislike the clutter of many interface elements - and 3D-Coat allows you to work in just this way. Just hide those elements of the interface that you find distracting and use ***keyboard shortcuts*** that give you access to the tools you need, only when you actually need them.

One of the most convenient "***Pop-Up***" tool panels is the "***Tool/Color***" panel. It contains all of the Painting Tools from the left tool panel, in addition to a handy ***color wheel.***

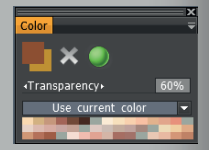
Paint and texture, freely, and press the "***Spacebar***" when you need to change to a different Paint tool or color.

To access the ***Main Paint Functions*** panel, just press "***~***" on your keyboard to bring it to the front of your work space - right at your ***cursor location.***



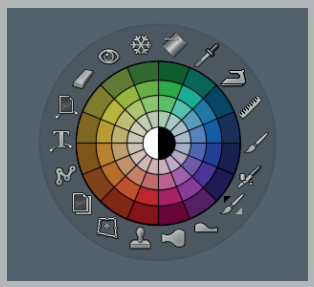
5.5 The Color Picker

There are 5 flavors to choose from, as shown at left. These are made available by left clicking on the color swatches in the top left of the main Paint Tool Panel. The pickers work just like their equivalents in other mainstream painting applications.

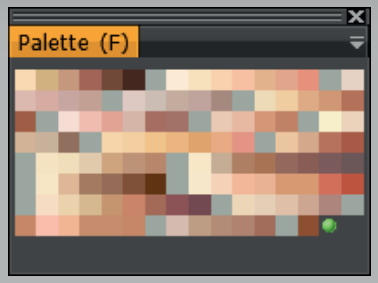


Color Image Window:

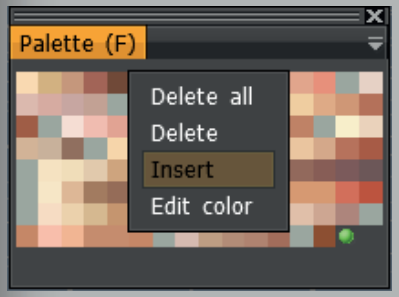
The exception is the "***Image Color Picker***", which allows you to assign an image of your choice - from which you can choose any hue present in the image for painting. This is also quite handy for keeping a ***reference image*** open at all times during sculpting or painting operations. You can manipulate which portion of this image is visible, and its position in the window, with the ***3 controls*** just underneath it and to the left of the image window. Select the image of choice with the "***Select***" button or "***Paste***" the image from your Clipboard. Once used, an image becomes available via the "***drop down arrow***" to the right of the ***image name***.



5.6 Custom Color Palettes

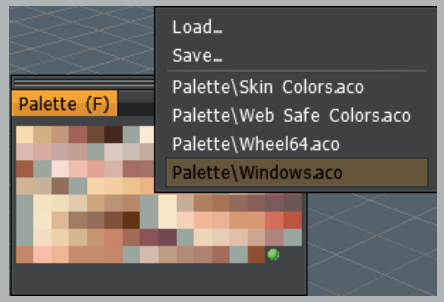


Create your own custom color palettes via the "***Windows/Popups/Color Palette***" menu. (you can assign a keyboard shortcut for this). ***Right click*** on any color to Delete, Insert or Edit any color using the Color Picker.

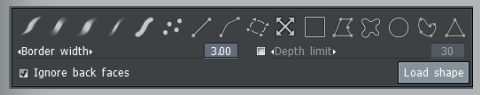


New Color Palettes can be created and saved for later access - these are stored in the main 3D-Coat folder, subfolder "***Palettes***". Once stored, these palettes will always be available in the list - accessible through the "***drop down arrow***" menu.

NOTE: To disable the use of Color, as defined by the Color Swatches, ***Right click*** on the Color Swatch - and an "***X***" will appear over the Color Swatch, informing you that you are no longer influencing painting with these colors.

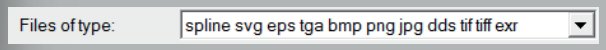


5.7 The "E" Panel



This Pop-Up panel contains some of the most powerful tools and functions within 3D-Coat. Not only does it contain tools for many different painting modes, for use with graphics tablets, but it also doubles as an arsenal of selection tools and voxel extrusion/intrusion tools.

Some of the tools work in conjunction with Brush Alpha shapes, and some have an adjustable set of parameters which determine things like edge sharpness and shape. Precise shape extrusions and intrusions can be made because of the "spline-based" nature of these tools - as well as open lines and curves with adjustable edge falloff. "***Load shape***" lets you use imported vectors and images for these functions.



Tablet-Based Tools/Functions

The first 5 tools in the "E" panel provide a broad range of effects for use with your ***pressure sensitive*** drawing tablet. There are good descriptions for each one when "***Hints***" are enabled in 3D-Coat "***Preferences***".

If you are using a ***mouse***, the first tool is a very good choice that allows good control of each stroke.

Dots, Lines, Curves and Stamps

These tools/functions are fairly self-explanatory and good descriptions are available also via "***Hints***" when they are enabled in the "***Preferences***" panel. Use the "***Stamp***" mode, (4th in this group), when you need to precisely position ***Alpha-based*** details on the surface of your model.

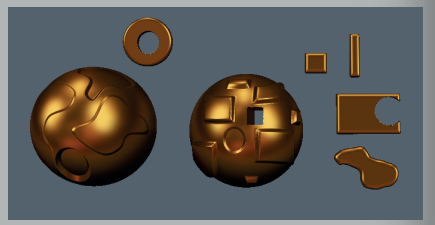
The "***Curve***" mode is good at evenly extruding things like consistent and smooth moldings and grooves. "***Dots***" mode lets you paint with spaced, Alpha-based Paint "***dabs***"

Closed Shape, Spline Tools

These tools are the most frequently used Brush tool modes for several reasons: the ability to make precise selections, through cuts, extrusions and intrusions - as well as precise shapes created in "***open space***".

They are particularly well suited for the creation of "***hard surfaced***" detail for voxel models. One example would be the creation of precisely defined metal plates of exact thickness, panels and windows which ***conform exactly*** to the surface of any voxel shape.

As selection tools, these Closed Spline Tools work "***all the way through***" your model - allowing for closely defined areas to be hidden, masked or "***Frozen***" - and they make shorter work of defining areas of density when using **AUTOPO** functions. Experimentation is a must for learning how powerful these tools are.



Some ***Closed Shape,*** spline tools - when used with the voxel sculpting tools - operate only on the ***visible*** surfaces of your model. When using the ***rectangle***, ***ellipse*** or ***contour*** tools, you can work on the back side or your model by un-checking "***Ignore backfaces***".

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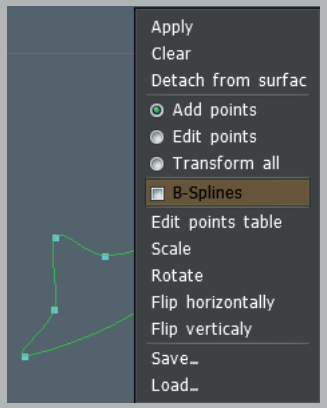
Draw with closed spline/B-spline: Add spline control points with the LMB. Press ***ESC*** to finish. Near the control points you will see a small ***spline menu button***. Press it and you'll be able to choose from various options:



Apply: Apply a spline action. You may use ***ENTER*** instead. With ***"Ctrl"*** pressed it will produce an "***intrude***" effect.

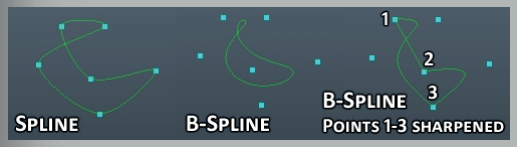
Clear: Clear all control points.

Detach from surface: This command detaches any control point that has been attached to a surface - (a control point becomes attached if you add it while the cursor is over the surface).

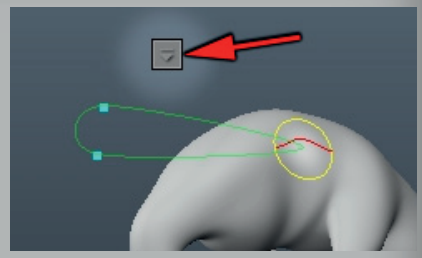
Add points: Use this command if you pressed ***ESC*** after adding control points and then you decided to continue. Press ***ESC*** to finish.

Edit points: This is the ***default*** mode after you've finished adding control points. Hover the cursor over a spline in the place where you want to add another control point (when you see a red dot, press ***LMB*** to add it).
Drag any control point with ***LMB***. Use ***RMB*** over any control point to ***toggle vertex sharpness***.

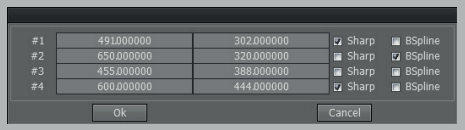
Transform all: Transform the whole spline with the ***widget*** (rotate, move, scale vertically, horizontally, proportionally).



B-Splines: Use B-Splines by ***default***. In this mode the spline will be smoother and will not go through the control points. Use it with ***vertex sharpness*** to get a variety of shapes.

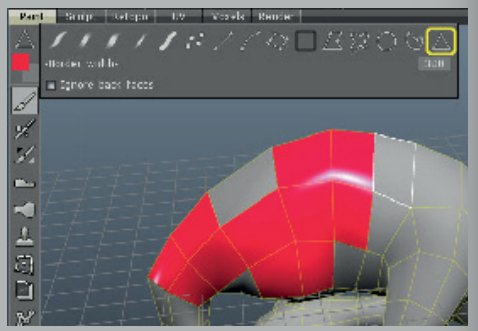


Edit points table: Set numerical values of each control point. In this window you can also set the type of each control point: ***Sharp*** (makes sharp corner at this point), B-spline (simple spline if unchecked).



Scale: Set the scale factor and press the "OK" button or ENTER.
Rotate: Set the angle of rotation and press the "OK" button or ENTER.
Flip horizontally: Flip the whole spline horizontally.
Flip vertically: Flip the whole spline vertically.
Save.: Save the spline to a file.
Load: Load a previously saved spline from a file.

Paint single polygons: (Only for use in the ***Paint Room***). This mode lets you paint ***single polygons*** with one click - or paint up to the borders of original, source polygons, continuously.



Border width: This slider is responsible for the border width when drawing with the rectangle, ellipse or contour tools.

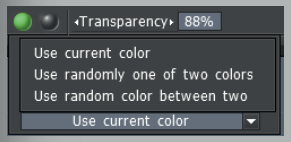
Ignore backfaces: This is a switch which toggles between drawing on the back side of surface polygons and not. This option is available only when drawing with the rectangle, ellipse or contour.

Depth limit: Limits the tool's depth of cut on underlying geometry.

6.0 The Paint Room

In the "**Paint Room**" you have access to a comprehensive set of painting, texturing, adjustment and texture transformation tools. These tools are located in the left side panel. You can also press the "***Spacebar***" for quick access.

Paint and Material Brush: This tool works in combination with the 3 Paint Channels, (Depth, Color, Specular), and its effect is influenced by which ***Alpha shape*** is chosen from the Brush Alpha panel. If no material is selected, the basic color or colors that are applied are indicated by the 2 ***color swatches*** at the top of this tool bar. If a ***Material*** is selected, a combination of interactions occurs, based on the Brush Alpha shape and those ***Material channels*** which have ***textures assigned*** - as well as which basic ***Painting Channels*** you have "turned on". Tablet response can also be set via the ***"E" panel*** - along with various curve and closed spline methods of paint application. (See "**The "E" Panel**)

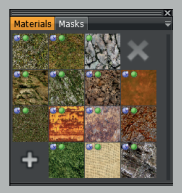


Airbrush: A softer brush which has an "accumulation" coefficient. This brush produces the most profound "***dabbed***" painting effect when used with the "***Paint with dabs***" Brush Option selected.

Clone Brush: Like traditional painting applications, this brush "clones" texture from one randomly selected area to another, ("***Ctrl-LMB***" to set source. See complete description on the next page.

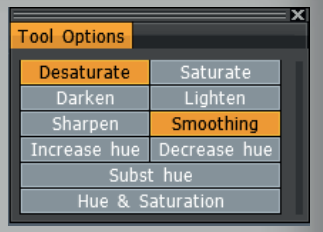
Eraser: Just like it sounds, but erases all information from whichever ***basic Paint Channels*** are enabled, (checked).

Eyedropper: More powerful than an ordinary eyedropper tool - this one samples the information from all 3 "basic" Paint Channels, (***Depth, Color and Specular***).



Fill Tool: Fills contiguous areas of color with either a single Paint value for all 3 basic Paint Channels, (***Depth, Color, Specular***), or with a selected ***Material***, (which uses up to 3 textures for each of these same channels).

6.1 The Texture Adjustment Tools



Color Operations: This tool has ***10*** different color adjustment functions which are "***Brushed on***", reacting with ***Alpha*** and/or choice of "***E" panel*** tool:

De-saturate: (decrement the chromatic level) When you press "***Ctrl***" the opposite action is performed, and it increases the saturation of the color.

Saturate: (increment the chromatic level) When you press "***Ctrl***" the opposite action is performed, and it de-saturates the color.

Darken: When you press "***Ctrl***" the opposite action is performed, and it lightens.

Lighten: When you press "***Ctrl***" the opposite action is performed and it darkens.

Sharpen: This accentuates the color definition. Use "***Ctrl***" to smooth.

Smoothing: This reduces the color definition. Use "***Ctrl***" to accentuate the color definition.

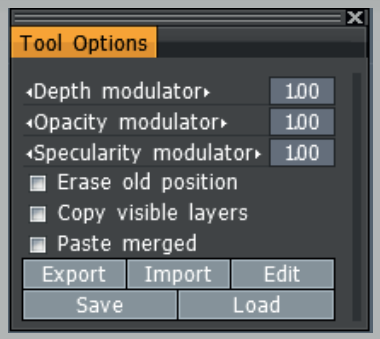
Increase hue: Incremental adjustment of the hue. (use "Ctrl" to decrement the value). The "***Transparency***" setting influences the degree of hue change.

Decrease hue: The inverse of the above function.

Subst hue: Substitute the hue in the current layer with the current color swatch.

Hue&Saturation: Substitute the hue and saturation from the current layer with the current color swatch. For example, paint on an object using color, then choose the Darken command. Paint again on the object in the same place to see how your current color darkens. Try different color operation modes, as this function is highly dependent on the color channel's transparency.

Magnification or reduction of Layer height: Choose the operations on the Layer height (increase or decrease). When painting, it is only the ***current Layer*** height that is changed. Press "***Ctrl***" to perform an inverted operation. When using this tool, both ***"E" panel*** functions and the selected ***Material*** are taken into account. Use the "***Degree of change***" slider to limit the amount of change.



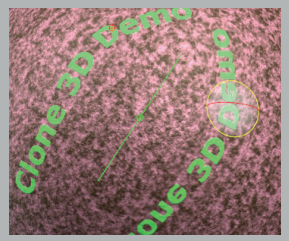
Shift Layer in tangent space: This tool lets you ***smudge***, ***collapse*** and ***expand*** the area under your brush. All operations will be applied in screen space, so you should try to ***center*** the area to be modified in the ***best view position***. This tool is intended to move only small details in the Layer.

NOTE: You must click the LMB to apply the last two operations.

Clone Brush: This tool can also be considered a "***Texture Adjustment***" tool, and it has quite a few options for use, so please read and test it out carefully to learn more about it.
Press "***Ctrl-LMB***" to mark a source point for copying, then paint using the ***LMB***. You can clone your texture, not only with a standard ***Brush Alpha***, but also with the ***frame*** and ***contour*** Brush functions - (press ***"E"*** for Brush functions). There exist a number of methods for cloning:

Translation: In this mode, press "***Ctrl+LMB***" to select the source point.
Dx: The horizontal shift of source point.
Dy: The vertical shift of source point.

Mirroring: Copying with mirror-reflection of a plane. Press "***Ctrl+LMB***" to select the point for the plane to go through.



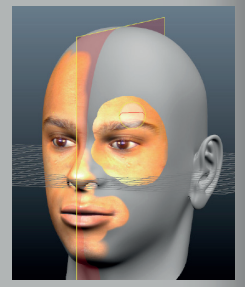
Inversion: Copying with inversion against the point. Press "***Ctrl+LMB***" to mark the center point of inversion: Center X and Center Y – positions of pivot point on screen. Press "***Ctrl+LMB***" in the corresponding places to change it.

Clone sector: Copy a sector rotated at a selected angle against the pivot point. Press "***Ctrl+LMB***" to mark the rotation center point. This mode can be used to multiply a pattern drawn in one sector all around. Center X and Center Y are the positions of the control point on the screen. To change its position, press "***Ctrl+LMB***" in corresponding place.

Number of sectors: Number of sectors when cloning a pattern in a sector.

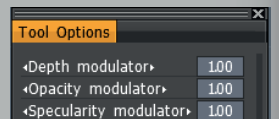
Counter clockwise: When enabled, the sector will be copied counter-clockwise.

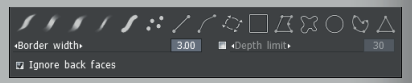
Symmetrical copy: Symmetrical copy lets you to copy a surface from one side of a model to make it symmetrical. Press "S" and activate symmetry before using this tool. This tool can be used on any of the three axes to copy symmetry. (Image left)



Copy using Brush: This lets you copy using topological symmetry. You should set up topological symmetry before using this tool. Topological symmetry can be defined in the Topological symmetry tool by selecting two symmetrical faces.

Transform/copy tool: Drag the frame and select an area to be transferred. The frame acquired can be dragged, or rotated. Use "***Shift***" to preserve proportions. Use "***Ctrl***" to drag vertices independently of each other. Press "***Esc***" to cancel the transformation and "***Enter***" to apply it. This mode is good to use in combination with the ***Rectangle***, ***Circle*** and ***Curve*** painting methods (press "E" to open the draw types menu). The border width determines the edge softness when transforming. By disabling channels (***Depth, Diffuse, Specular***) you can limit the channels that are affected. In the transform mode the surface area is erased from its old location and ***copied*** onto the new one.





In order to simply copy without deleting, do not check the "***Erase old position***" option. It is possible to transform whole block of visible Layers and paste them merged or separately. You can select what to copy, not

only with the ***Rectangle*** tool, but also by using the freehand selection tool, and others. The options for this tool are as follows:
Depth modulator: Additional depth modulator for the transformed area.

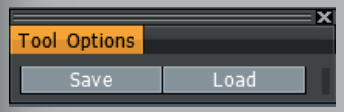
Opacity modulator: Additional opacity for the transformed area.
Specular modulator: Additional specular modulator for transformed area.

Export: Export selection to a .PSD file.
Import: Import a selection from a .PSD file.

Edit: Edit image with an external editor that supports .PSD files. By default it is Adobe Photoshop.

Save: Save transform parameters and image to InstallDir\User-Data\StoreData\Rects\
Load: Load transform parameters.

Copy/Paste: You can copy parts of a surface to the clipboard by using CTRL+C and then paste them using CTRL+V. If the cursor is not on an object, it will be pasted to the same place it was copied from. Images in the clipboard can be edited in another graphics editor, then copied back to the clipboard and pasted onto the object surface. If the color channel is open for editing, the color texture is placed into the clipboard; if it is disabled, then the depth texture will be placed into the clipboard; in case the depth is disabled for editing, then the specular texture will be placed there. Hence, you can copy and edit in a different graphics editor any of the channels depth, color or specular. If you press CTRL+SHIFT+C a new pen is made from a surface part and added to the pen list. When you press CTRL+SHIFT+V the mirror reflected part is pasted. Bear in mind that copying and pasting are pen-turn sensible. Copying and pasting objects with the help of hot keys is not limited to Copy/Paste tool, but is possible in any other mode.

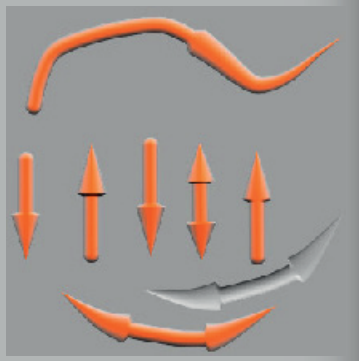


Save: Save the clipboard image into a file.
Load: Loads the clipboard image from a file.
Using these functions, you can create a library of stamps. Load a plane or a cube, for example, draw a button or a rivet, then save it to a file. As with depth, so the color and specular will be saved, too.

Paint with Splines: Upon activating the tool, the ***Parameters Panel*** will be activated. There are many parameters for the curve tool:

Curve profile: First let's take a look at the Curve profiles.

- Uniform. The curve with no linear modulation.
- Sharp. The curve sharp on edges.
- Obtuse. (flatten) The curve flattened on edges.
- Arrow.
- Arrow back.
- Double arrow.
- Arrow.
- Back arrow.
- Double arrow.
- Arrow.
- Back Arrow.
- Double arrow.
- Sinuous.



Ignore back faces: When this option is activated, you paint only on the visible part of the surface.

Closed curve: Closes the curve.

Use spacing: Points will be set along curve with some spacing and jittering. It lets you make new effects with curves.

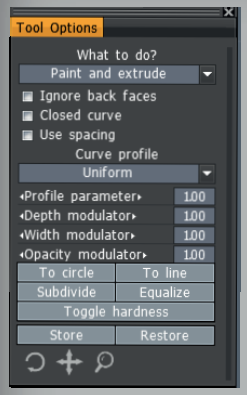
Toggle hardness: This mode lets you toggle the hardness of the spline vertices by clicking on he vertex. Pressing "***Esc***" cancels this mode.

Profile parameter: This parameter affects the linear curve profile in case you selected the ***sharp*** or ***obtuse*** profile.

Depth modulator: Modulator, impacting the entire curve depth.

Width modulator: Modulator, impacting the entire curve width.

Opacity: Transforms the current combination of points to a circle if possible.



To line: Transform the current set of points to a line if possible.

Subdivide: Subdivide curve.

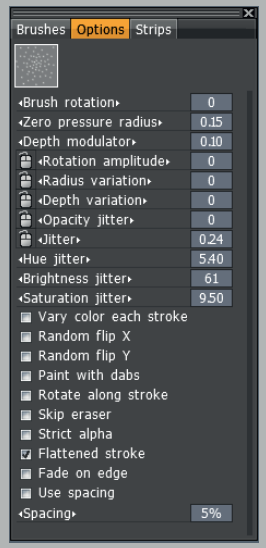
Equalize: Set equal distances between points.

Store: Save curve to a file with *.curve extension, placed into: InstallDir\UserData\StoreData\Curves\ by default.

Restore: Load curve from a file with CURV extension, located in: InstallDir\UserData\StoreData\Curves\ by default.

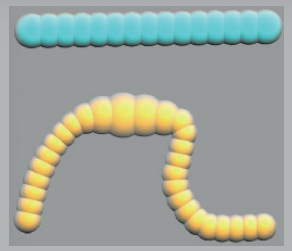
Moving the whole curve: Use the 3 icons on the right bottom of Parameters Panel menu - You can ***rotate/move/scale*** the entire curve. **NOTE:** You can use "***Ctrl***" while dragging a point to rotate the whole curve and you can also use "***Shift***" while dragging a point to move the entire curve.

Paint a spline by ***Left-Clicking*** to position a few points. Hovering the cursor over one of the blue dots causes it to highlight. ***Left-Clicking*** captures the point and allows you to drag it into a new position. Click again to release the control point.



Splines are handy used together with ***Strips*** to carefully paint a chain or a series of rivets. Clicking "***Enter***" applies the spline to the object. ***Left-Click*** to add new points to the spline. Pressing "***Enter***" to complete a curve produces a raised element - while completing the spline with "***Ctrl-Enter***" indents the curved elements. Use "***Backspace***" to delete the last point and "***Esc***" to delete all points.

Curve Profile: There are many curve profiles, you are encouraged to test them all out. They range from arrows to rounded ends, but of course there are many more.



Use spacing: Points will be set along the curve with some spacing and jittering. Spacing combined with the various "Jitter" options can create a wide variety of effects. Curves will be drawn correctly, even if their knot points are far from each other and the surface between them is quite curved.

With the "***Paint with Splines***" tool, you are not only able to paint and extrude/intrude, but you also can do the following:

Erase: Erase the current Layer along the curve.

Freeze: Freeze along the curve. "***Ctrl-Enter***" to unfreeze.

Make Planar: Flatten the surface along the curve. Set absolute height. Apply the plane tool along the curve and then apply the usual extrusion. This sets the absolute (not relative) depth along the curve.

Painted Text Tool: Using this tool you can select the font for text, input the text so as to change the parameters of the curve the text is applied along. Use the following options with this tool:

Ignore back faces: When this option is activated, you draw only on the visible parts of the surface.

Closed curve: Draw a closed curve.

Flip text: Flip the whole text.

Depth modulator: Modulator, impacting the entire curve depth.

Width modulator: Modulator, impacting the entire curve width.

Opacity modulator: Modulates the opacity of the entire curve.

To circle: Transform the current set of points to a circle if possible.

To line: Transform the current set of points to line if possible.

Subdivide: Subdivide the curve.

Equalize: Set an equal distances between the points.
Toggle hardness: This mode lets you toggle the hardness of the vertex in a spline by clicking on the vertex. ESC cancels this mode.

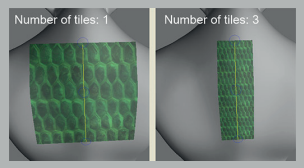
Save: Save text and font in a .txt file, placed into InstallDir\User-Data\StoreData\Texts\ by default.

Load: Load text from a .txt file, located in InstallDir\UserData\ StoreData\Texts\ by default.

Add new points into the spline by "***Left-Clicking***". Use "***Enter***" to apply, with depth - upon applying, the text will be extruded outward over the curve. Pressing "***Ctrl-Enter***" indents the text into the object. Use "***Backspace***" to delete the last point, "***Esc***" to delete all points. Click on a blue sphere to move it. Painting with text along a curve allows you to paint and extrude, as well as letting you ***Erase/Freeze/Make Planar/ Set the absolute height***. You can place text along any polygonal surface and along any contour.

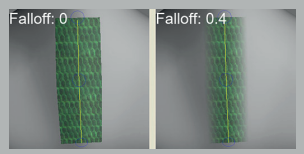
Place Image Along Spline. You can apply an image along a spline curve with this tool. You can select the images used for ***Depth*** texture/***Color*** texture/***Specular*** texture to tile along a spline. There are several settings and functions:

Number of tiles: Specify the number of tiles. A lower number produces fewer tiles.



Falloff: Opacity falloff.

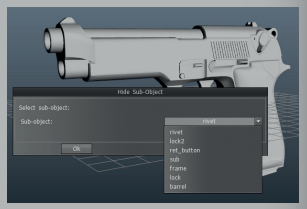
Extrusion: Extrusion of the whole texture.

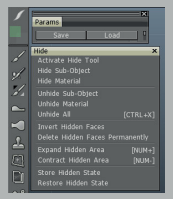


The other parameters are the same as used with "**Paint with Splines**". With the "***Place Image Along Spline***" tool, you also can ***Erase/Freeze/ Make Planar/Set absolute height***. Here is an example of using an image along a spline to freeze an area.

Erase: Erasing the ***Color***, ***Depth*** or ***Specularity*** in the current Layer. Eraser intensity depends on the slider for Eraser transparency. Erasing only effects your currently active Layer.

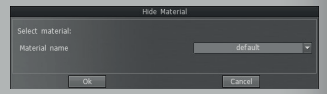
Hide: Hides selected polygons. "***Left-Clicking***" with a Brush hides parts of the surface by painting on the model. Pressing "***Ctrl***"shows previously hidden surface areas. Use "***Ctrl-X***" to unhide all. "***NUM+***" or "***NUM-***" makes the hidden area wider or narrower.





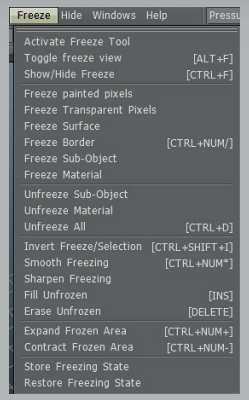
Hide Parameters: Using the additional Hiding menu you can save/load hidden areas as presets. In these instances you will also have a drop-down list so that you can select between these presets.

Hide Menu: Additionally, you can access the more advanced functions of the Hide tool in the main menu in the "***Top tool bar***". For convenience, you can also undock this menu (like any other menu) and place it in an easy to access area. With this menu, you are not only able to hide surfaces by painting on the model, but you also can hide the whole object by selecting the object you want to hide. For example, if there are several sub-objects in the scene, you can use "***Hide Sub-Object***" to hide a specific object, as in the picture below. If there is only one object in the scene, "Hide Sub-Object" will hide only that object. You can also hide faces by their specific material, use "***Hide Material***". Select one material from this menu and all the surfaces with that material will be hidden. The other commands are self-explanatory.



Freeze Surface tool: This is a mode of freezing surface parts to prevent their subsequent change. Freeze mode can be conditional, for example for relief, flat or colored parts depending on mode selected. Blocking masks the action of feathering. Freeze mode is an operation opposite to selection. Press "***Shift***" to smooth out the edges of blocking. This drop-down list provides the various Freeze modes. When the Brush goes along the surface, it gets ***masked*** in accordance with the condition you choose in this menu.

There are five ***masking*** modes in total:



Freeze all: Mask with a touch of the Brush or mouse-click (default mode).

Convexity: Mask the convex parts of the surface.

Concavity: Mask the concave parts of the surface.

Not key color: Mask all, except the color currently selected.

Key color: Mask the color currently selected.

There are ***three sliders*** on the top bar for the freeze tool:

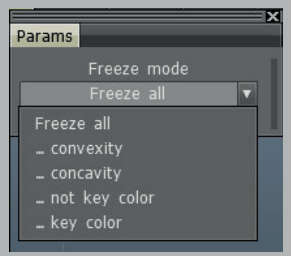
Contrast: This parameter increases the freezing contrast.

Smoothing degree: Sets the smoothing level of the freeze area.

Freeze degree: Controls the level of the opacity of freezing. Masking can be saved to a file and loaded. In this way you can create a set of handy masking outlines for your model. If you saved at least one file, subsequently, you will have a drop-down list offering a selection of files. Of course you can also access many more options for the ***Freeze*** tool in the main menu of the top tool bar.

Freeze the surface: Freeze all the surfaces with the current condition.

Invert freeze/selection. The frozen surfaces will be unfrozen and the surfaces which were not frozen will be frozen.

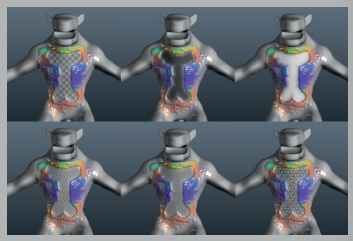


Toggle freeze view: There are six modes with which you can view the frozen area.

Many of the other commands are self-explanatory as well, and you are strongly encouraged to explore each one.

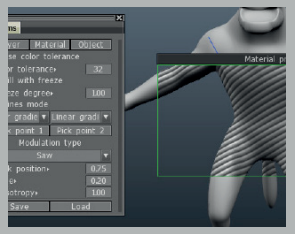
Fill Tool: If you are familiar with the fill tool in Photoshop or other photo-editing programs, then you should be quite familiar with this tool already. It lets you fill in self-contained areas based on a number of parameters you can specify. There are three main parameters by which you can fill:

Layer: Fill the whole Layer.



Material: Fill the material of the object.

Object: Fill the sub-object.



There are sub-options for this tool as well, that you can use with each of the three main filling methods:

Use color tolerance: This lets you fill in your color or material based on its "closeness" to another color. By using the slider you can adjust this value. The higher the tolerance, the larger area and/or more existing colors it will fill.

Fill with freeze: Instead of a color fill-in, the surface will be filled by freezing. The Freeze degree slider is responsible for maximal freeze values.

Lines mode: Lets you fill-in by setting two points. The vector between them is considered the main direction when using distortions. If you have chosen the Fill with gradient, the surface will be filled with color gradient from the main color to secondary one. Otherwise, the main color is used for filling-in. If the pen radius differs in the starting and final point of the line, then the modulation scale will smoothly change from the start to the final point. You can use gradient filling in the fill tool in a much more intuitive way.

Modulation type: In case the "***Use with other tools***" option is selected, the modulation acts not only in the "***Fill mode***", but with the standard

Brushes too. There are are number of basic and user-adjustable types of modulation available:

No modulation: Filling will be done without additional modulation.

Noise: Random noise.

Gaussian noise: Random modulation with Gaussian noise applied.

Wavy surface: Wavy surface y=sin(x).

Stripes: Stripes that are perpendicular to the main axis.

Saw: Saw-tooth shape.

Hexagon: A correct hexagonal grid will be used as the volume texture when modulating.

Random spheres: Space filled with random spheres will be used as the volume texture when modulating.

Pores: Generation of pore-like surface.

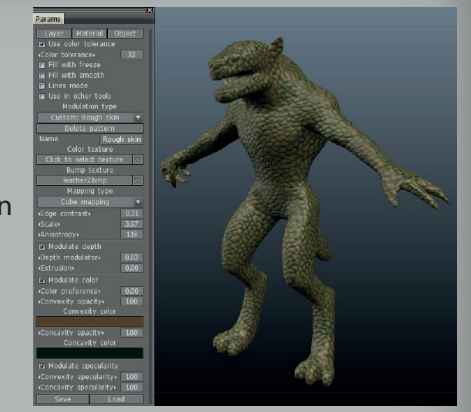
Spots: Generation of "pimpled" surface.

Fractal N1: Volumetric Perlin noise.
Fractal N2: Square of Perlin noise.
Fractal N3: Perlin noise limited by planes.
Fractal N4 (cracks: Resembles cracks.

Fractal wood N1: A set of distorted planes perpendicular to the view direction.

Fractal wood N2: A set of distorted cylinders. To set the cylinder axe, go into the lines mode.

Fractal tree N3: Wood with knot imitation. Contents



Custom: Rough skin.

Add custom: This lets you create your own custom modulation type. Depending on the modulation chosen in the "***Modulation type***" menu you will have the ability to adjust a number of parameters for each one. They are as follows:

Peak position: The position of maximum.

Scale: Scale of modulation.

Anisotropy: The degree of stretching or compression of details along the direction selected. If no direction is set, then it is a vertical axis. Switch into the lines mode to specify the direction.

Width of jag: The relative width of jag.

Pores size:
Spots size:
Cracks width:

Edge contrast: This parameter determines the smoothness of the edges in cube mapping.

Bump texture: The bump texture to be used in cube- mapping.

Color texture: The color texture to be used in cube-mapping.

Name: The name of a custom pattern.

Delete pattern:

Modulate depth: Select this point if you want to modulate the depth when filling. The parameters are as follows:

Depth modulator: Modulation value.

Extrusion: The addition extrusion. "***-1***" means that the surface will only be indented, "***1***" – only extruded.

Modulate color: Select the corresponding color operation and paint with it. Vary the opacity to make the effect stronger or weaker. These parameters are listed as follows:

Color preference: This slider determines the preference of color use between color for convexity and concavity.

Convexity opacity: Convexity opacity modulator.

Convexity color: This color corresponds to convexity.

Concavity opacity: Concavity opacity modulator.

Concavity color: This color corresponds to concavity. Contents

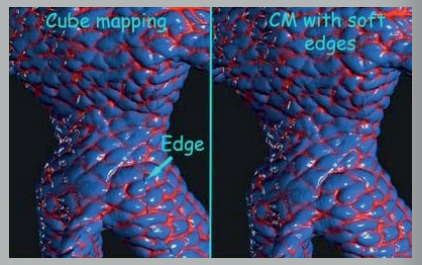
Modulate specular: Select this option if you want to modulate specular channel. These parameters are as follows:

Convexity specular: Convexity specular modulator.

Concavity specular: Concavity specular modulator.

To apply the new fill pattern you should specify a texture for the Bump channel and a texture for the Color channel (optional). They will be mapped on an object using cube mapping with soft edges. The screenshot to the right shows the difference between usual cube mapping and mapping with soft edges. In this way, you can texture objects seamlessly, with ease. It is easy to create materials like skin or pores with this method.
Save/Load fill parameters: Using the menu "***Store/Restore***" you can store parameters of the Fill to file, located in "InstallDir\User-Data\StoreData\Fillers\" folder by default.

Here are a few things that are worth noting about the Fill tool. You are not only able to use the Fill tool separately, but also in combination with other methods. For example, we can use the Fill tool in combination with a Material. In the picture at right, we have filled in a certain area with a Material, using the cubic mapping method. On the edges we created freeze areas, while the inside area was filled in. Pay attention when lines modes and Fill tools are used in combination, you can fill closed spaces with a color gradient.



Another thing to note is that if your fill area is very large, you may get a warning prompt from 3D-Coat letting you know that it may take a while to fill. If that does happen, please be patient! The application hasn't frozen - just calculating.

Eye dropper: Pick the ***Color*** and ***Specularity*** from the surface of an object. Use the hot key "***LMB-V***" to pick the primary color and "***RMB-V***" to pick the secondary color outside this tool. Use "***H***" to pick the top Layer. Use "***G***" to pick the depth of the Brush.

Make planar: This tool flattens the geometry on the object. Use the ***LMB*** to make the surface inside the Brush cursor flat. The Brush shape is stored. By choosing the "***Smoothing***" command, the advanced Plane tool menu with a set of options opens:

Normal source: This option determines if the normal and point of the plane should be taken from the first click position or from the current point.

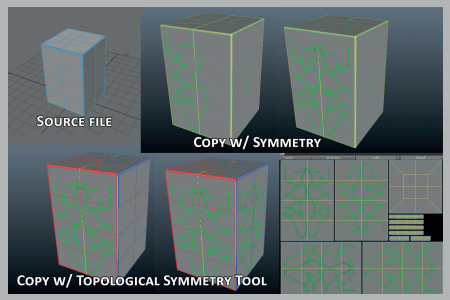
Plane extrusion: Lets you make additional extrusions while making the plane. It works like a clay brush.

Make planar: Makes the surface planar.

Cut off: Cut off parts above the plane.

Fill mode: Fill holes below the plane.

Topological symmetry tool:



Topological symmetry lets you copy surface pieces if they have a symmetrical face structure - even if they are not symmetrical geometrically. Select the red face with a "***Left click***" and then select the blue face. It is better if they are adjacent. Either way, the contents should be symmetrical to each other. This lets you define the topological symmetry. The settings for this tool are as follows:

Work mode: Lets you choose between two modes: setup symmetry by picking two symmetrical faces or copy from one side to another using the Brush.

Copy red to blue: Copy the red part of mesh to the blue one. You should define them before using this tool.

Copy blue to red: Copy the blue part of mesh to the red part. You should define them before using this tool.

Flip Layer: Flip Layer using topological symmetry.

Copy freeze mask: This is pretty self-explanatory. It lets you copy a freeze mask from one side to another using the topological symmetry tool.

Save: Store symmetry state to .SYMM file.

Load: Restore symmetry state from .SYMM file.

Measuring tool: This tool lets you measure distance between two user specified locations. Here are the parameters:

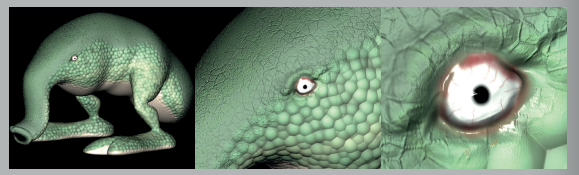
Original mesh units: You can define the units of measurement and measure line length.

Units to display: You should choose the units to display. There are parameters in these combo boxes: Meters (m), Millimeters (mm), Centimeters (cm), Kilometers (km), Foots (ft), Inches (in), Yards (yr) and Miles (mi).

Scale: The scale can be used to transform units. Usually you don't need to enter this value manually.

Length: The length of the red line.

7.0 Ptex



Ptex is one of the more amazing technologies, allowing you to paint extremely high resolution textures on a per polygon basis, as well as completely bypassing all UV work - as it does not require any manual input for the creation of the UV maps. Ptex, in it's current implementation, only supports quad polygons, no triangles or N-gons.

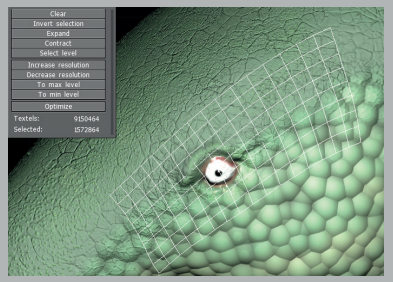
It's important to note that when using Ptex in 3D-Coat, you can increase the resolution of individual polygons if you require more texture details in the local area of that polygon. By increasing the resolution of a polygon, or group of polygons, it is effectively increasing the size of that polygon on the auto generated Ptex UV map.

For example, you could paint very small details inside of areas on a mesh which calls for an extreme close up shot or just requires more detail in one particular area - yet, you don't want to create a lot of very high resolution texture maps. Ptex works quite well for this purpose.

What is even more remarkable is that the .ptex format can store hundreds of thousands of textures directly with in one .ptex file. At this time, only external application that supports the .ptex format will be able to import/export the .ptex file for use. To fill in this gap in .ptex support, we have provided for the export of an ordinary texture map, based on Ptex technology, in the .TGA, .BMP, and .PNG formats.

Upon importing a mesh for Ptex painting, you will be prompted to select a number of options:

Millions of polygons: This is the mesh resolution as sub-divided after the "Smooth object" operation is performed. This should be higher than the number of pixels of your texture map.



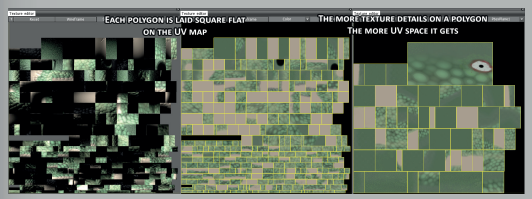
Carcass resolution: This is the mid-poly resolution, it only effects the viewport performance and display of the mesh in the viewport.

Ptex Texture Size for Export: You can select a texture resolution between 512x512 and 8192x8192. You can also change this at any time you need to scale up or down your texture resolution.

Weld vertices: This will weld any vertices which share the same position.
Swap Y and Z. This will swap the Y and Z axes. This allows for an easier time when bring meshes from applications such as Rhino or 3DSMax. Ignore smoothing groups. Ticking this will ignore any smoothing groups which you have on your mesh.

Invert normals: This will flip the normals of each polygon.

Auto smoothing groups: Will automatically scan the mesh for sharp angles between polygons, and apply smoothing groups to them automatically, maintaining any sharp edges that are present. Each of the following Ptex functions requires a selection. To make a selection, simply activate the Ptex Local Resolution tool and "paint over" the polygons in the viewport.



Local Resolution parameters:

Clear: Clear any selection.

Invert selection: Invert your selection.

Expand: Expands your selection by one contiguous polygon.
Contract: Contracts your selection by one contiguous polygon.
Select level: Manually key a local polygonal subdivision level.

Increase resolution: Increases the local resolution of the currently selected polygons. This effectively increases the polygon size on the auto generated Ptex UV maps.

Decrease resolution: Decrease the local resolution of the currently selected polygons. This effectively decreases the polygon size of the auto generated Ptex UV maps.

To max level: Sets your current selection to the maximum level allowed for Ptex. Effectively increasing selected polygons nearly taking up their own UV map.

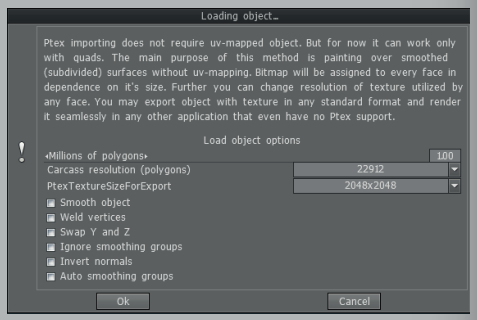
To min level: Sets your current selection to the minimum level allowed for Ptex. Effectively shrinking selected polygons, allowing more polygons per UV map.

Ptex Texture Size: You can pick the texture resolution for each ptex generated texture. Selectable resolutions range from as low as 512x512 to as high as 8192x8192. You can change this at any time to suit your needs, as well as upon importing the mesh for ptex painting.

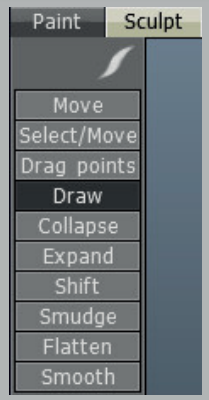
Optimize: Organizes polygons on every auto generated Ptex UV map to fit more polygons, based on local resolution (poly size per UV space).

NOTE: When using this, do keep in mind that if you have been using a mesh with specific auto generated Ptex UV maps, it will completely reorganize the polys on all UV maps, rendering your previous auto generated UV maps useless. However, you can always bake the details from one mesh to another. Just be sure to save two meshes: Your original and the baking target mesh.

For more information on Ptex, please visit the official Ptex website at http://ptex.us/



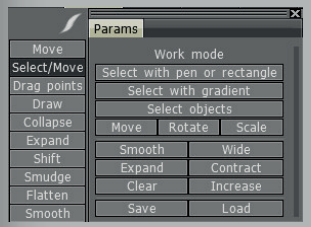
8.0 The Sculpt Room



The Sculpt Room and its tool set are 3D-Coat's equivalent to what other applications refer to as "***Polygon Sculpting***". Different from Voxel Sculpting, Polygon Sculpting simply allows you to move, deform and shape the ***surface*** of your object - (whereas Voxel Sculpting deals with the entire volume of an object). The Sculpt Room can only be used ***after*** a topological mesh has been created, either with an external polygon modeling application - internally, with manual Retopo tools - or with our own ***automatic topology*** tools (***AUTOPO***).

The Tools

Move: Drag the surface under the brush cursor. Use CTRL to drag along the average normal.



Select/Move: Select surface parts and modify them (move, rotate or scale). The available parameters for this tool are as follows:
Select with Brush or rectangle:

Select with Brush, rectangle or curve: Use CTRL to subtract a selection, SHIFT to add a selection.

Select with gradient: Selection is done with a gradient. Click to determine the start position of the gradient and then click again to determine the end point.

Select objects: Select the whole object with LMB.

Move: Move the selected area.

Rotate: Rotate the selected area.

Scale: Scale the selected area.

Smooth: Smooth selection.

Expand: Expand selection.

Clear: Clear all selections.

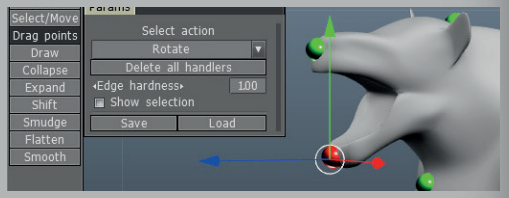
Widen: Make the intermediate area of a selection wider.

Contract: Contract selection.

Increase: Raise selection value by 10%.

Save: Save the selection to a file.

Load: Load a selection from a file.



Drag Dots: In this mode you can add control points and drag them to new positions, thus "***morphing***" the affected area of the mesh. The size of the ***Dot*** determines the region of influence over the mesh. (***Rotation*** and ***Scaling*** can be performed also). Use the "***Delete***" key to delete a selected Dot. Select several Dots simultaneously using the "***Shift***" key. The available parameters for this tool are as follows:

Move: (Hot key SHIFT+"W"): Move the selected area.

Rotate: (Hot key SHIFT+"E"). Rotate the selected area.

Scale: (Hot key SHIFT+"R"). Scale the selected area.

Delete all handles:

Edge hardness: Increase this value if you want to transform more of the hard-edged polygons.

Show selection: Show which selection corresponds to the selected Dot.

Save: Save the handle positions to a file.

Load: Load the handle positions from a file and add the handles to the existing handle array.

Paint: Paint with pen. Use CTRL to cut into and SHIFT to smooth the surface.

Collapse: Collapse a part of the surface. Use **CTRL** to expand the surface.

Expand: Expand a surface part. Use CTRL to collapse.

Shift: Shift the surface along pen motion in screen space.

Tangent Shift: Shift the surface along pen motion in normal plane.

Smudge: Smudge along the surface under the pen.

Flatten: Flatten the surface under the pen.

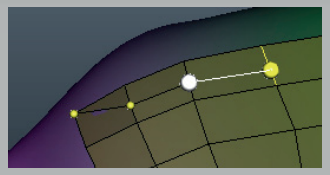
Smooth: Smooth the surface with the pen.

9.0 The Retopo Room

3D-Coat offers the most powerful set of retopology tools in the 3D industry. These tools let you quickly and easily change the existing topology of a model. 3D-Coat can be used purely as a retopology tool. Just open a reference mesh and start retoplogizing it by covering it with new polygons. If the reference mesh is textured, 3D-Coat will be able to bake not only the geometry but also all texture maps onto the new topology.

Tools & Commands

This tool section lets you create new topology for any existing mesh. Each tool in the retopology section will be covered here, as well as most of the commands for each tool.



Add/split: This tool lets you simply add edges by pointing and clicking in the location you would like to add the edge.

Select: This tool has three primary modes, allowing you to select Points, Edges and Polygons. Each of these modes has further functions.
They are as detailed for Points (these are also the general commands for most of the other tools):

Import: This lets you import a mesh for retopologization.

Export: This lets you export your retopologized mesh in .OBJ, .LWO, .STL and .PLY formats.

Snap: This snaps the retopologized mesh to the underlying mesh, if you have modified the underlying mesh in anyway.

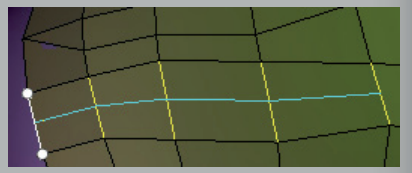
Subdivide: This tool is self-explanatory. It subdivides the mesh. For example, each polygon is divided by 4.

Clear: This will clear the retopologized mesh in the scene.

Relax: This relaxes the current retopologized mesh.
selection of edges.

Delete: Point and click to delete edges.

Edge loop: Quickly add an
edge loop, by hovering over edges to get a preview. Use the LMB and clicking to add the edge.



Edge ring: This is the same as Edge loop, however it runs perpendicular to the direction of the edge loop function.

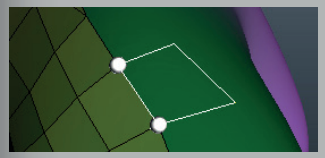
Delete: Deletes selected polygons. You can also achieve this by hovering over a polygon and hitting the DELETE key.

Subdivide: This is the same as for polygon mode, or any other subdivide option in 3D-Coat.

Hide: This tool makes it easier to retopologize in very tight areas. If you are running into a problem, simply select the polygons in question, and hit the hide button.

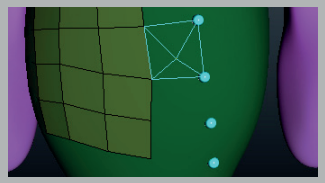
Invert hidden: This will invert the polygons you may have previously hidden.

Unhide: This will unhide all polygons previously hidden.



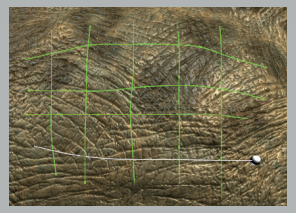
Quads: The basic use of this tool lets you select an edge of a polygon, and then drag out and click the placement of the edges for a new polygon. There are four different methods of use for this tool, and they are are fairly similar. You are encouraged to try each one. They are: ***2-clicks method, Parallel, Direct*** and ***Trapezoid***.

Points & Faces: This method is quite handy when starting out on your retopologization. You place points with the LMB, and once there are qualifying areas to place polygons, you only need to use the RMB to place the polygons. You will see a blue outline of where the polygon will be placed. You can move the points by using the RMB to click and drag it around. You can also delete a point by hovering over it and hitting the DELETE key. This tool will only work with tris and quads.



Cap: With this you can cap any existing hole in your polygonal mesh by pressing the RMB over it. It will create triangles only. It is best used for the end of a pointy object, such as the tip of a sword or spear, pointy ears or tails.

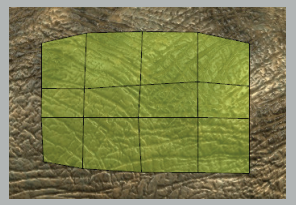
Strokes: This is a very powerful tool in the retopology arsenal. With it you can quickly retopologize cylindrical objects such as arms, legs and other similar items. You can draw lines by clicking and dragging the LMB. There are a few commands local to this tool:



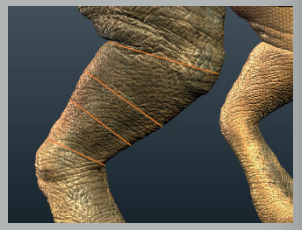
Clear: Clear all the drawn lines.

Smooth: Smooth all current drawn lines.

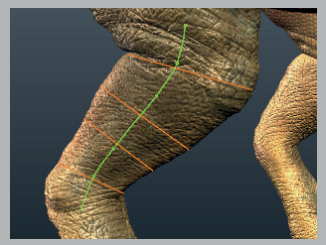
Delete: Delete your currently selected line.



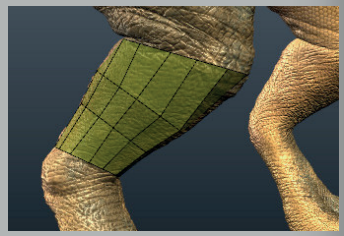
Here is a more in depth look at it all. Firstly we'll start by making some strokes in the viewport to cover the whole of this leg. When that is done, a spline will loop around. We'll create a few loops to have some area to create polygons in.

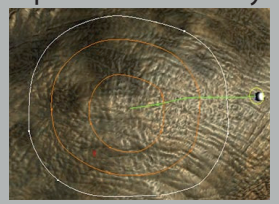


Next we'll create a perpendicular line within the confines of the area of the mesh, opposed to the previous lines. You'll notice that line is a green color instead of orange.



Green lines mean that it is discontinuous. Orange lines mean that is is continuous and makes a full loop around to connect back to itself. Now let us take a look on the top toolbar, we'll need to select a number of segments. You will get ring of polygons with corresponding number of segments. Now we'll try something a little different: instead of drawing lines around a mesh, let us draw a grid look within the mesh, instead of slices as before. Now press the Enter key and you will have the area you surrounded with the strokes created as polygons.

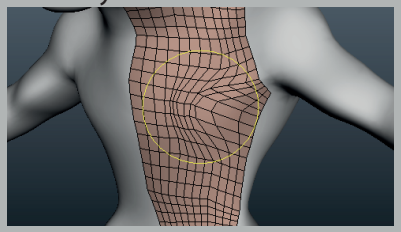




Now let's demonstrate one more method here. We're going to draw a circle within the confines of the mesh, to create edge loops, or circles. Then we'll draw a perpendicular stroke to the circles that we previously created and then hit the **ENTER** key. You'll notice that it automatically created our

entire loop based on the ***Number of segments*** setting in the top tool bar, similar as before with the first demonstration we gave for cylindrical objects. These are just some of the methods with this tool that you'll soon discover. You are encouraged, as with all other tools in 3D-Coat, to dive in and find out what tools and techniques work best for you.

Brush: This tool lets you move vertices based on your brush size and intensity, using the LMB. You can also smooth the vertices with your brush using SHIFT+LMB.



9.1 Tweak & Commands

This set of retopology tools lets you tweak the current retopologized mesh in the viewport. Please notice that the commands for each tool in this Tweak section have very similar commands to those listed above in the ***Create & Commands*** section. If there is a unique command, it will be listed with its respective tool.

Delete polygons: You can delete polygons with this tool simply by clicking them. With the CTRL key you can also delete all connected polygons.

Delete edges: With this you can quickly delete edges, edge loops and edge rings. Hover your mouse over the desired selection and click the LMB.

Collapse: Hover your mouse over a selected edge and click the LMB to collapse all connected points of that edge to one location. With CTRL+LMB to apply this to an entire edge ring.

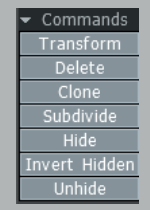
Split rings: This is exclusively an edge loop tool. Hover the cursor over an edge where you would like to apply a new edge loop and click your LMB.

Move vertices. Also known as a "tweak tool" in some packages, it lets you quickly move a point, edge, polygon, edge loop or edge ring. Select the mode you would like to use in the top tool bar, size your brush accordingly and move around your selection.

Move Vertices:

Slide edges: Slide a selected edge between its two parallel edges by clicking the LMB and dragging.

New Select Commands for Edges: "**Extrude**" allows for the extrusion of selected edges, while "**Bevel**" allows you to specify a bevel of a certain width to selected edges.



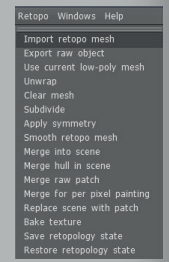
Transform: New Transform widget for selections. (New "To Local Space" option)
Delete: Delete selections
Clone: Clone selections
Hide: Hide selections
Invert Hidden: Invert hidden selections
Unhide: Unhide all selections.

9.2 Retopo UV's

The UV tools for the Retopo room have been expanded to include every UV tool from the UV room in 3D-Coat. You can find information on each of the UV tools inside the Retopo room in the UV section of this manual.

9.3 Retopo Menu & Tool Bar

Of course any good tool has more to it then meets the eye. The retopology tools are no exception. You can find the menu in the top tool bar, under Retopo. Below are listed all of the functions in this menu.



Import retopo mesh: Import an external mesh to continue creating topology started in another 3D modeling program.

Export raw object: Export a retopo mesh to continue work in another 3D-modeling program.

Use current low-poly mesh: A reference mesh can be imported to retopologize big objects made in another 3D modeling program. They can contain reference to textures. In this case the objects will be colored; color will be used in baking and merging into the scene.

Unwrap: The same as Unwrap in Mark seams mode.

Clear mesh: Clear the whole mesh.

Subdivide: Subdivide the whole mesh.

Apply symmetry: Apply symmetrical mirroring.

Merge into scene: Lets you merge a retopologized mesh into scene. All details from the reference mesh will be baked into a new object. Additional extrusion can also be applied. A UV-set is required, but if you have not assigned a UV-set it will be generated automatically.

Merge hull in scene: Merges outer mesh over reference object into scene. This function works like Merge into scene but is optimized for a multi-object reference mesh. It prefers outer points while baking surface.

Merge raw patch: Merge a raw patch into the scene. No baking will be performed. This command can be used to merge a new object without projecting details from the reference mesh.

Merge for per pixel painting:

Replace scene with patch:

Bake texture: Bake texture onto patch. This operation requires a UV-set.

Save retopology state:

Load retopology state:

And we have these items in the top tool bar for the Retopo tab:
Z-bias: Adjust the z-bias to get a better look at the retopologized mesh preview.

Additional extrusion: You can extrude the retopologized mesh. This is a great way to make clothing for your characters.

9.4 Retopology Groups (Layers)

3D-Coat has a Layer system for retopologizing meshes. This makes it easier to retopologize your meshes with problem areas and to have multiple retopology versions of the same object. Much like all the other Layer tabs in 3D-Coat, they function like the Layers in Photohop. You can click and drag Layers to reorder them, drag them to the Trash icon to delete them, hide & show them with the Visibility icon, etc.

Let's take a look at the Retopo Layer tab:

Layers: As you see in the screenshot, you can have more then one Layer to retopologize, if you wish. They can be reordered by drag and drop, they can be dragged to the trash if you no longer need one. Double-clicking a Layer will allow you to rename it.

Visibility: Each Layer has its own visibility icon, allowing you to toggle them on or off.

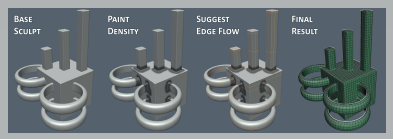
There are icons along the bottom of the tab as well, and they are:

New Layer: Creates a new layer. 

Trash can: Deletes the selected layer.

Subdivide: Lets you to subdivide the whole selected Layer.

10.0 AUTOPO (Auto Topology)

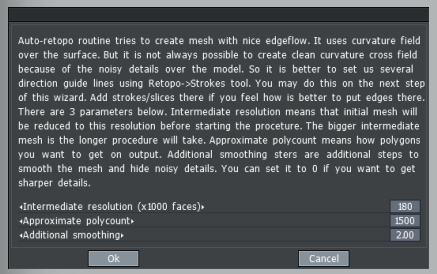


Manual retopology is great, when you need a very specific mesh. But what if you don't need an exact, extremely precise mesh topology? This is where **AUTOPO** comes in.

With AUTOPO you can let 3D-Coat determine where ***edge loops*** are placed. Or, you can manually specify where you wish the edge loops to be, as well as predefine ***dense*** or ***sparse*** mesh areas. One thing to note, however, is that Autopo doesn't work directly on polygons; Only voxels! So keep this in mind if you wish to use the AUTOPO tool on a mesh, to do so, you must first "***Merge***" the mesh into Voxel space and then apply the AUTOPO tool.

The meshes generated with AUTOPO can be very clean and functional, even with little user input for the guides and density painting.

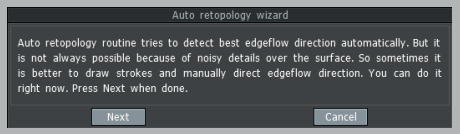
To use the AUTOPO tool, you must **RMB** click on the particular layer for which you wish to create automatic topo;ogy - in the **VoxTree** (which can be accessed in the Retopo room via the top menu under Windows>Popups>VoxTree), and select any of the AUTOPO options.

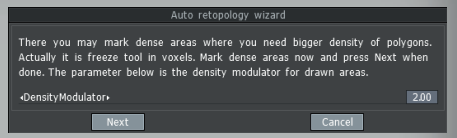


Doing so will start the AUTOPO "**wizard**", which will run you through the various options for creating an auto-generated mesh or a semi-auto-generated mesh (where you suggest ***edge flow*** and l***ocal mesh density***).

The first step of the wizard will have you specify an "**Approximate polygon count**" of the mesh. After this, a second dialog appears, in which you can paint areas where you wish to produce more density in the mesh.

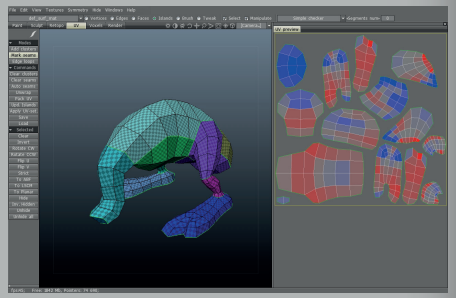
The third and final dialog of the wizard lets you place ***spline guides*** upon the object to suggest where you wish to have the ***edge loops/flow***. Of course both the density painting and spline guide topology "***suggestions***" are optional, if you wish 3D-Coat to generate a mesh entirely with little input from the user, AUTOPO produces surprisingly good topology for ***organic*** shapes.





After the algorithm completes its work, the mesh will be placed into one of the various rooms you have previously chosen to place it into (the ***Paint Room*** if you selected a painting method, or the ***Retopo Room,*** if you simply selected AUTOPO with no Paint method options selected.

11.0 The UV Room



From version 3.2, the UV tools have been improved, substantially! You can now edit not just islands with these tools, but also polygons, edges and vertices themselves. There is also now a "Brush" tool, so you can tweak your UVs to your liking with the gentle distortion of a brush, allowing for smoothing and other quick manual UV techniques.

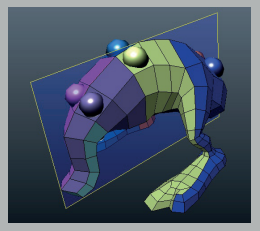
You may have noticed that the UV tools covered in this section are also found in the "Retopo Room". This is because the Retopo room requires it's own set of UV tools for editing "Retopo" meshes.

Note that these same tools are only being defined in this section of the manual - to eliminate redundancy.

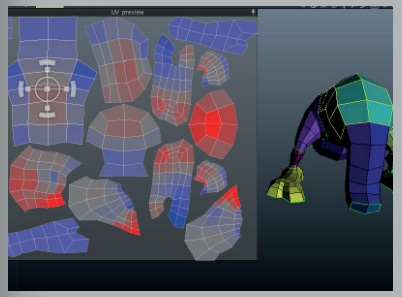
Before unwrapping, you can specify which unwrapping algorithm you wish to use. There is the older LSCM unwrapping, and the newer ABF++ unwrapping. When you mark a new seam, 3DC unwraps new clusters in real-time and shows you the preview of the unwrapped clusters immediately - so that you can see the degree of distortion for every part. Having this convenient function helps to keep you from forgetting the location of any seam or cluster.

3D-Coat also supports the creation and editing of multiple UV maps on a single mesh.

11.1 Modes



Add clusters: Click the LMB to add a cluster center directly on a polygon face. Clicking again on the same face will remove it. This tool lets you "mark" a seam without actually marking it as one, allowing for a whole UV island to be split into parts without actually splitting them.



Mark Seams: When you are ready to unwrap your mesh to create a UV map, you must first of course select your seams. That is where this tool comes in. You can select edges with the LMB, edge loops with SHIFT+LMB and deselect with CTRL+LMB.

Edge loops: This tool is no different then holding down SHIFT+LMB with the "Mark seams" tool. The difference here is that you are not required to hold down the SHIFT key to select your desired edge loops.

11.2 Commands

Clear clusters: Clears all UV clusters (also called UV islands) and seams.

Clear seams: Clears only the seams of the current mesh.

Auto seams: This function is mostly self-explanatory. It will essentially create seams automatically with a "best guess" on what edges to select as the seams.

Unwrap: Fits all clusters into the UV space.

Pack UV: This will pack all unwrapped UV clusters onto the UV map. When this operation is complete, you can then edit the islands on the UV map. At this point you can perform many essential functions which require a UV map.

Update Islands: When you have an existing island, and further mark a seam on that island causing it to become two, you will need to perform the Upd. Islands command to carry that information to the UV Preview Tab so that you will then have those two UV islands selectable, in the UV Preview Tab.

Apply UV-set: Clicking this will apply the currently defined UV set to the current mesh.

Save/Load: You can also save and load seam and cluster information of the current scene so it can be edited later. Note that this does NOT export or import a UV map.

In addition, advanced tools for editing your UV maps directly reside in the "Selected" portion of the of the retopology tools. These tools all require a selection in the UV Preview window. To select a cluster (or island) simply click on one with the LMB.

11.3 Selections

Clear: Clears the selection.

Invert: inverts the selection.

Rotate CW: This will rotate the selected island clock-wise.

Rotate CCW: This will rotate the selected island counter clock-wise.

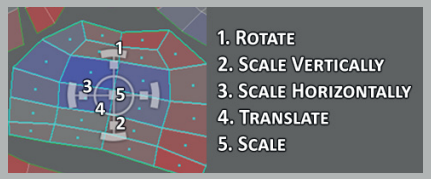
Flip U: This will flip the U of the UV map.

Flip V: This will flip the V of the UV map.

Relax: Applies a light smoothing across the selected cluster (or island) to relieve stretching or pinching.

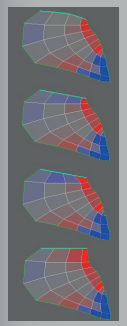
UV Preview Tab: Inside of the UV preview window you can also manipulate your UV islands & more directly. By clicking the LMB on an island, you'll then see a manipulator gizmo. Selected islands will then highlight all edges of it's respective polygons inside the 3D viewport.

UV Preview Manipulator:



This manipulator lets you scale, stretch, rotate and translate whichever cluster you currently have selected. You can manually place your clusters as you see fit before packing them into a UV map. You must have the "Manipulator" tick box turned on to use this. It can be used Vertice, Edge, Poly & Island modes.

In the block selected you will find a set of commands that are related to the selections made in the UV preview window. After applying the Unwrap command you may want to edit UV island in the UV preview window.



In the top panel you can choose selection types: Vertices, Edges, Faces, Islands, Brush and Tweak. Select vertices, edges or faces (depend on what type have you chosen) with LMB. If you hold LMB and drag the mouse you can select several vertices/ edges/faces. Use SHIFT to add an item to selection, use CTRL to subtract an item from selection. Depending on selection type operations in the Selected block may change.
Vertices Mode. Lets you Clear, Invert, Rotate CW, Rotate CCW, Flip U, Flip V and Relax.

Edges Mode: In Edges selection mode there are a few new tools. They are: To line, Equidistant, Horizontal, Vertical. The following tools are for edges mode:

Select Edge Loop: You can select an edge loop by double-clicking on an edge or you may simply use an Edgeloop command in the Selected block. With Edgering command you can select edge rings.

To Line: This command places all selected edges along the line. Equidistant. This command places all selected edges along the line andsets equal distance between points.

Horizontal: This command puts all selected edges horizontally.

Vertical: This command puts all selected edges vertically.

Set seams: This command marks selected edges as seams.

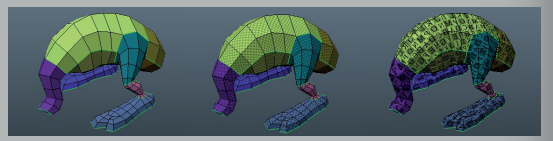
Del seams: This command unmarks selected seams if there are such.

Faces Mode: This selection mode differs from Vertices selection mode in four additional commands: Hide, Inv. Hidden, Unhide, Unhide all. Use this commands to show only selected faces in the viewport. All other commands work the same as for Vertices.

Islands Mode: This selection mode lets you operate with separate UV islands. You can translate, rotate and scale (vertically, horizontally and proportionally) an island with the help of Manipulator.

NOTE: that you need to activate the manipulator on the top bar. Check the Select and Manipulate check-boxes. Also, Keep the Select check-box always checked unless you don't want to select anything.

Unwrapping Methods:



These commands are important, as any mesh you create will need to be unwrapped if you wish to paint a texture, or do any such work. They are listed, as follows:

ABF (Angle Based Flattening): ABF is a newer unwrapping method and is better used for organic meshes.

LSCM (Least Squares Conformal Maps): Meshes in 3D-Coat are unwrapping with LSCM by default. This method is also used for organic meshes, but unwraps inorganic meshes quite well too.

Planar: This projects across the arbitrary axis, so you may use it if you need.

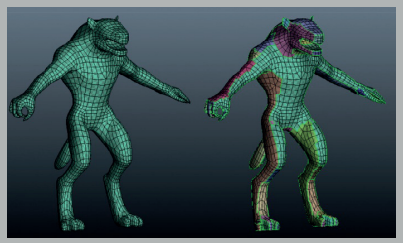
Brush mode: In this mode you operate with the brush which size and be changed by holding RMB pressed and moving the mouse aside. With the LMB click and drag you can manipulate the mesh under brush. Use SHIFT+LMB to smooth the mesh. Use CTRL+LMB to pinch the area under the brush. Use SHIFT+CTRL+LMB to expand the area under the brush.

Tweak: It lets you drag vertices, edges or faces around in a very easy way. Simply move the cursor over a vertex/edge/face until it becomes highlighted and then drag it with LMB.

Checker Options: The mesh can be displayed in one of three ways: with no checker, with simple checker, with complex checker.

Multi-UV Support: Another drop-down list on the left of the top bar is to choose a UV-set list. If the mesh has a multiple UVs you can switch them in that drop-down list.

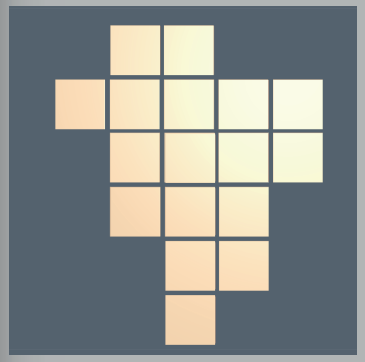
Overlapping Uvs: You can have overlapping UVs within 3D-Coat with no problems occurring.



12.0 The Voxel Room

What are Voxels?

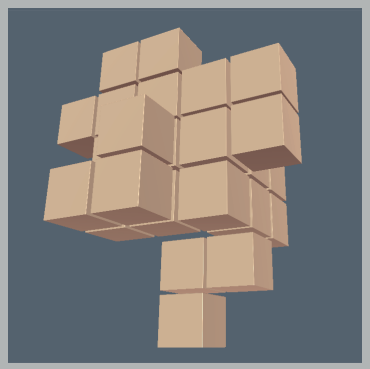
Voxels are the 3D version of pixels, in a nutshell. A pixel is represented by a square, having the same height and width - and having a specific size. Given any 2 dimensional area, this area can only contain a set number of pixels.



Voxel is a new word that really stands for "***volumetric pixel***", since it has ***depth***, as well as ***height*** and ***width***. Mathematically, voxels are numerical values [0..1] placed in a cubic grid. The object's surface is located where the value is equal to 0.5.

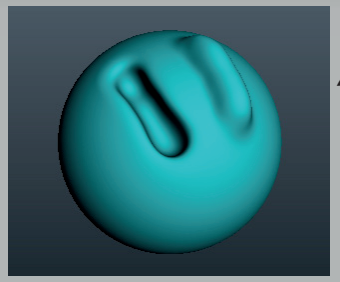
Like pixels, voxels have the same width and height - but also have dimension along the typically "z" axis - which is the same as the distance for its height and width - in essence, a voxel is a ***cube*** - floating in an invisible mass of voxels which occupy an infinite volume of space.

For any given 3 dimensional volume, there can only be a set number of voxels occupying this space.



In a black and white painting program, "***paint***" is applied to a given ***area*** by giving any number of invisible pixels, occupying that area, a value of ***black*** or ***white*** - (a pixel is either ***"on"*** or ***"off"***) - thus making it appear that some of the area is ***"empty"*** while other parts are ***painted*** - like black paint on white paper.

In a voxel program, painted "***volume***" is applied to empty space by giving any number of invisible voxel cubes an ***"on"*** or ***"off"*** value - which produces the impression of a 3 dimensional shape floating in empty space - some cubes are turned "on" while others are turned "off" (some represent ***occupied space*** and some represent ***empty space***). An



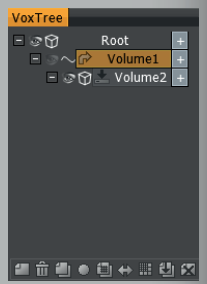
additional benefit of voxels in 3D-Coat is their ability to be assigned a color and a ***"material"*** or ***"shader"*** (giving the additional illusion of some real world or "other wordly" substance).

For the user, this experience simulates working with a solid or semi-solid material (like clay or molten wax) by means of functions that mimic the use of real world sculpting tools.

Nearly every other 3D-sculpting program is polygon-based, which means that they work only with the ***surface*** of 3D objects -- they manipulate a ***"skin"*** which has no thickness. But voxel-based sculpting programs work with the volume of 3D objects -- they manipulate a kind of "solid mass". This approach lets you sculpt without any topological constraints: it lets you build up complex objects from "nothing" and to endlessly add and subtract volume "mass" -- and easily punch holes in the objects. This approach gives you total freedom in your 3D sculpting.

With voxels, you can work like an old-fashioned, real-world, clay-based sculptor -- one who never needs to think about dreary technical things like polygons and topology and who, therefore, can just freely and easily express himself. If you need to sculpt an ear, an arm, or a leg, simply start putting together lumps of digital clay!

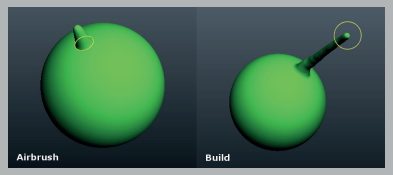
As fantastic as voxels are, you should also understand some of the ***limitations*** of this technology. For instance, objects ***can't*** be ***extremely thin*** in a voxel form. If you want to make a very thin surface, like ***cloth***, you need to ***increase the resolution*** of the voxel object to avoid the appearance of 3D "jaggies".



A more convenient way to work with very thin layers of voxels is to use the new "***Surface Mode***" for voxels. This can be done by clicking on the ***Cube icon*** next to the particular ***Voxel Layer*** you would like to work on -- and cube icon will then change to a ***wavy line***. The wavy line icon tells you that you have entered the Surface mode.

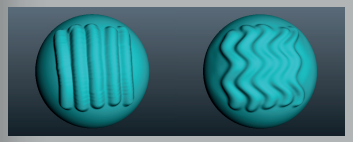
12.1 Voxel Sculpting Tools

When you're in the Voxel Room, there are a robust set of tools that you can use for sculpting and to perform different operations. They are located on the left-side tool panel. You can always obtain access to the ***Voxel Tool Panel*** by pressing "***Spacebar***" anywhere on the screen. As with any other panel, you can pin it for your convenience.



Grow: Increases or decreases the surface beneath the cursor. None of the Brush Alphas having any effect on "Grow" - just the brush size and the intensity. Press "LMB" and move the mouse to produce an expanded section. CTRL+RMB to produce a contracted section. On the top panel, the "Growth power" slider controls the intensity of the expansion and the "Thaw power" slider controls the intensity of the contraction.

Fill: Fills any cavities or voids that you apply the brush to. Its action is similar to the "Smooth" tool, but more precise. It's useful when you want to make cavities shallower, but not fully level with the rest of the surface. It sometimes requires very high intensity settings to fill areas.



Clay: Lets you blend expansive strokes quickly on the surface of your model. It will also simultaneously smoothes the surface after you've applied it.

Carve: Lets you place high peaks and deep gouges quickly on your model, but with no smoothing.

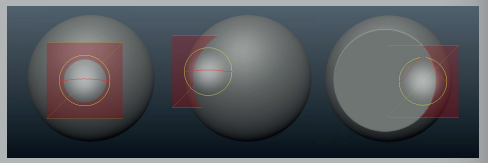
Airbrush: This tool provides a very controllable way to add volume to your model. Unlike the Clay tool, it constantly grows underneath your brush as you press the LMB, regardless of mouse or stylus motion.

Build: This tool is similar to the "Grow" and the "Airbrush" tools. But while the Airbrush will continue to build while holding down your cursor, "Build" doesn't do that. You have to move it, like the "Grow" brush. However, with the Build tool you can determine the Brush interaction by means of the Brush Alphas (no smoothing is applied).

Extrude: This tool is very similar to the Carve tool, but it includes intense smoothing.

Sphere: This tool is a very quick way to create bubbles, bodies, eyeballs, etc. The size of the sphere is dependent on the size of the brush. You can also make it dependent on stylus pressure: click on the icon near the ***Sphere extrusion*** slider. The maximum size will be the maximum size of the brush. You can create separate spheres and long, "pill-shaped" cylinders rounded at the ends, by left dragging in open space. Because of this, regular, "button based" viewport navigation needs to be accompanied by holding down the "Alt" key.

2D-Paint: This tool paints voxel thickness on two axes which you specify by right-clicking anywhere in space or on the surface of an object. Notice first that, as you rotate the view and move the brush, it's moving along the two axes. When you change your view, new strokes will always face the camera. Pick any Brush Alpha you like and just paint! It also has an important option on the top tool bar: "Double sided". With this checked you can paint double-sided strokes.



Plane: This tool, new in version 3.2, acts just like a carpenter's wood plane does. It will scrape the volume away, from the set position as well as the normal of the brush cursor. You set the brush cursor's position and normal by clicking and holding the RMB and then dragging along the surface of a voxel object. There are five modes by which you decide the position of the brush:

Pick point & forward direction: This will place the cursor at the last location you used the RMB, facing toward the camera.

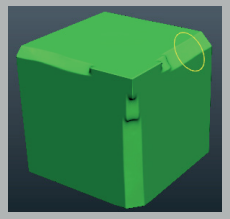
Pick point only: This will place the cursor at the last location you used the RMB only. Its direction is based on the settings in the parameters tab.

Pick point & direction: This will place the cursor at the last location you used the RMB, and its direction will be based on the average normals of the voxels that your brush covers.

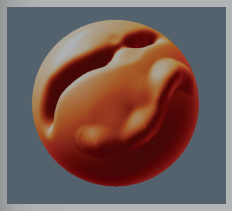
Pick point & direction (local): This will place the cursor at the last location you used the RMB, and its direction will be based on the single normal of the voxel your brush is centered on.

Navigate: Lets you navigate the viewport. This can also be done while holding the ALT key.

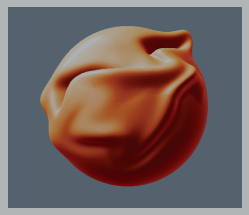
Now we'll continue with the other tools:



Scrape: This tool is not affected by pens, just the Size of the brush and the Intensity. It's very similar to the Flatten tool: it flattens the surface beneath the brush.

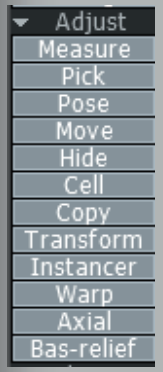


Pinch: This is great for making very nice tight edges, cavities and peaks.



Smudge: This tool drags the surface topology along with the brush. It's great for producing wrinkles on a character or a piece of clothing.

12.2 Adjustment Tools

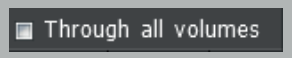


Measure: By clicking and dragging with the ***"LMB"*** you can measure from the beginning to the end of your stroke allowing you to more accurately sculpt to scale.

Pick: Sometimes when you have more then one object in the VoxTree, it can become a tad cumbersome to know which layer has what object. With the Pick tool you can visually select the object (and therefore the VoxTree layer) simply by clicking on the one you wish to work on.

Pose: This tool is great for quickly changing the rotation, scale and translation of a selection. You can determine the selection in several ways. You can use a line, ring, sphere -- and you can even paint on it with a pen or an object. Check the Airbrush mode when using Select with pen to increase the selection area smoothly. After a selection is made, a special posing gizmo will appear.

The Pose tool has three states: Rotate, Scale and Translate. You can switch modes by clicking on the long red rectangular bar at the base of the gizmo. In each state the gizmo has set of parameters in the Params window. Finally, as with all tools in 3D-Coat, the pose tool respects symmetry, as well as all selection modes, like drag rectangle, lasso, etc. Now, the Pose tool works on all visible objects (through all volumes).



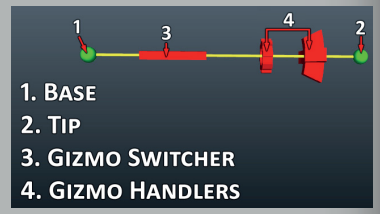
Let's now take a look at some of the pose tool parameters:

Line: This mode lets you draw a line-based gradient for use with the pose tool gizmo. It starts with your initial LMB click and ends with the release of the LMB.

Ring: This selects a ring-based gradient. It starts with your initial LMB click and ends with the release of the LMB.

Sphere: This selects a spherical gradient. It starts with your initial LMB click and ends with the release of the LMB.

Select with pen: Selecting with pen mode lets you directly brush on your selection. The pen size directly affects the selection area. Furthermore, you can also smooth your selected area by holding "***Shift + LMB***". This is a great way to select things quickly if you just need tiny little details selected. This mode also has a special option,

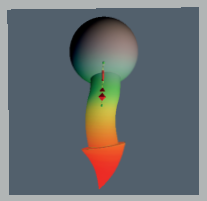


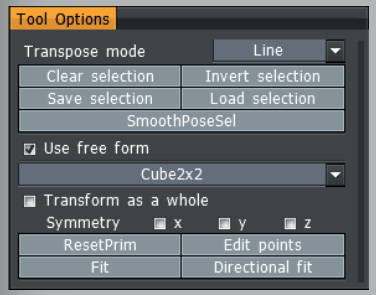
Airbrush mode: By using airbrush mode you can also smoothly selected areas instead of having a hard edged selection. It makes for tidy deformations around the edges of your selection.

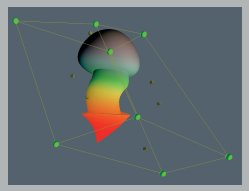
Note: "***Select with pen***" mode is very useful. With the Pose tool, you can use almost any of the selection methods in the Pen mode bar, like drag

rectangle, lasso, etc. You can also subtract your selection by using the tool normal while holding the CTRL key.

Object: If you have multiple objects in your VoxTree, this mode can come in very handy. Simply click on the object you want to deform using the Pose tool and it will place the entire volume as your selection.



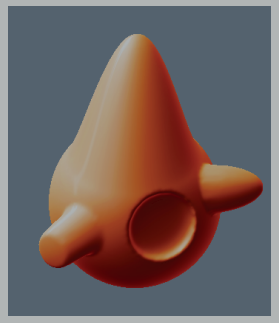




Use free form: A new feature has been added to the Pose Tool which allows for using a lattice to deform the selected Pose area. Select from several lattice shapes to transform the Pose selection.

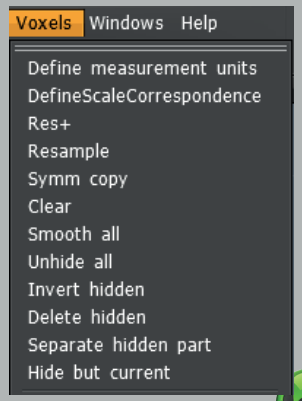
"**Fit**" and "**Directional fit**" give you the most control over the Pose area.

Move: This tool is one of the most powerful and versatile tools in the voxel arsenal. Not only can it "***adjust***" any shape, large or small, but it also can act as an "***Extrusion/Intrusion***" tool.

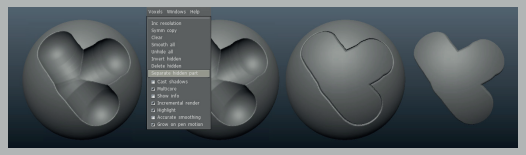


Drag with the "**LMB**" to move the surface within the area of the cursor, relative to the screen view. Hold down the "***Ctrl***" key to move the surface along the ***normal***. The "***Move***" tool also interacts with ***Brush Alphas*** - providing a wide array of effects.

Hide: This tool has been improved greatly. You can now hide on a *per voxel* basis. This lets you to paint the areas you wish to hide, while it also respects other selection methods, like drag rectangle, drawn contours, etc. This new method of hiding makes it much easier to create many hard edged surfaces for objects. The tool also has a few other functions, which you will find in the Voxel menu. They are listed as follows:



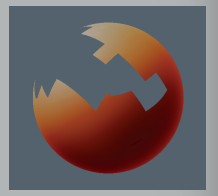
Unhide all: Unhides any hidden voxels.



Invert hidden: Inverts hidden voxels.

Delete hidden part: Deletes any voxels you have hidden.

Separate hidden part: Creates a new Layer in the vox tree and places the previously hidden voxels into the newly created Layer.



Continuing with the other tools, they are:

Cell Hide: This hides "cells" of voxels based on your brush size. Unlike the other Hide tool, it does not allow sculpting or separating hidden parts to create seams and other objects.

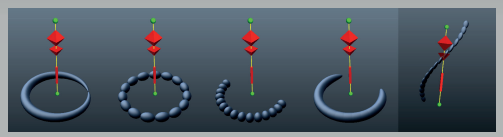
Copy: To use this you must have two Layers in the ***Vox Tree*** It is preferable if one of the Layers is empty, but it doesn't need to be. In your other Layer there must be a portion of a volume object you wish to copy: with this Layer visible and your empty Layer active, you can brush along the surface of the background object. This will copy the brushed areas to the previously empty Layer. It is a really quick way to create objects based on a character's surface topology, like body armor, clothing, etc.

Transform: This tool lets you rotate, scale and transform your currently selected Layer. By grabbing one of the gizmo handles you can constrain to whatever axis you clicked on. You can also perform a screen-based rotation using the large outer circle. The options for this tool are:

Move only gizmo: Lets you make adjustments exclusively to the gizmo. This helps when you need to place the gizmo in another location.

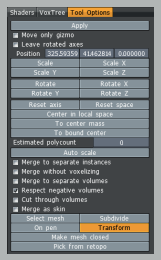
Leave rotated axis: This is great for when you need to rotate an object multiple times while retaining its previous rotations.

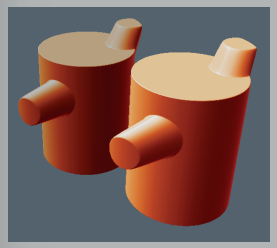
Position & Axes (1,2 & 3): These parameters let you manually key in the position and rotational coordinates.



Scale (X, Y & Z): These parameters allow you the manually key in scalar modulations.

Reset axis/space: These two functions let you reset an object's axis or local space.





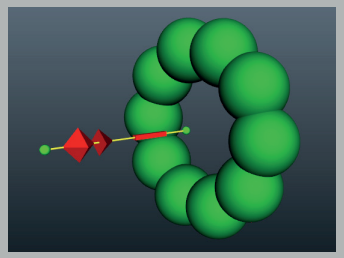
Instancer: A memory saving method of making duplicates of your voxel objects. Instances consume far less memory than duplicates. You can "**Clone**" an instance (Right Click menu) and "**Merge**" new objects as instances. Negative volumes can also be instances.

Warp: You'll find this tool is quite versatile! It lets you twist and bend the currently selected object Layer in the ***Vox Tree***.

Note: Each function of the ***Warp Types*** will *alter* any of the other type's end functions. Experimentation is strongly encouraged.

The following descriptions are based on the use of a default sphere, so let's take a look:

WarpType: Drop-down list with two methods: Bend and Twist. Bend will bend or wrap the current Layer around the base of the gizmo. Twist will rotate the current Layer around its pole. The following functions are for the Bend type: Segments count. Increases the number of segments.



Start/Final angle: Adjusts the beginning and end of the wrap.

Forward Step: Create a "spiral staircase" look: it will literally spiral the object upward.

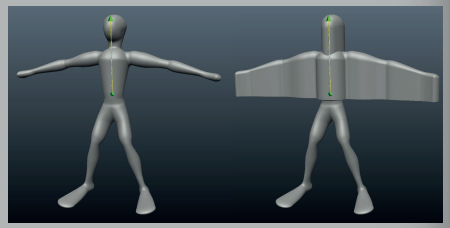
Overlap: This tapers each segment where they meet. The effect will vary depending on the object.
The following functions are for the Twist type:

Segments count: Increases the amount of segments.

Twist angle: Twists the current object around the gizmo.

Overlap: Tapers each segment where they meet each other, simultaneously increasing/decreasing the space between each spiral.

Axial symmetry: This tool lets you clone the active Layer from the Vox



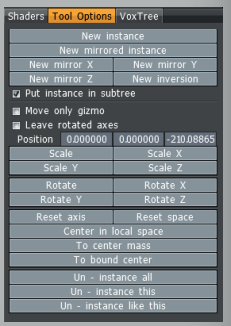
Tree with axial symmetry: You can set the number of copies in the

Params tab: The gizmo works just like all the other gizmos. Move the translate handler (octahedron-like) to get an idea of similar things you can do with it. You are strongly encouraged to explore this tool's possibilities.

Bas relief: This looks at the existing volume of an object, and extrudes to create new volume based on the position of the gizmo. The area at the base (sphere) of the gizmo from the tip is the area that will be affected. It is great for creating coins and jewelry.

12.3 Object Tools

Logo: The logo tool lets you import any black and white picture and convert it to voxels. You can convert images that are in the .BMP, .TGA, .jpeg and .PNG formats. Click on the ***Logo*** tool and select an image. When imported, voxels will be created on the basis of grayscale image. It will default to the merge tool, so you can use the standard merge gizmo here.



Cut&Clone: This tool will let you cut and clone the volume of a voxel object based on the type of brush parameters. It defaults to the drag rectangle pen mode and will copy the whole volume of the object underneath. You can also adjust your border parameters with three different types: Round, Plane and Sharp.

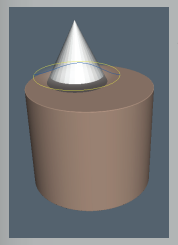
Clone: Clones the selection without cutting.

Split: This tool is very similar to the Cut&Clone tool. It has the exact same border settings. The difference is that it tears a chunk of the object that you are operating on and creates its own object Layer in the VoxTree.

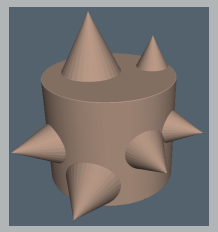
Merge: This tool lets you import polygonal meshes to convert into voxels. Let us first go over some of the basic functions of this tool:

Select mesh: Selects a mesh stored on your hard drive.

Pick from retopo: If you have something retopologized in the Retopo tab, then you can use the mesh to merge to voxels.



On pen: Turns any merged mesh into a "Merge on the Fly" tool, which allows you to merge any object at the cursor position (respecting the base object's normals and intrusion into or extrusion above the base object). Adjust the merged object's size by Right button - dragging left or right, and adjust its intrusion or extrusion by Right button dragging up or down.



Subdivide: Subdivides your un-merged mesh, giving it more initial resolution before merging.

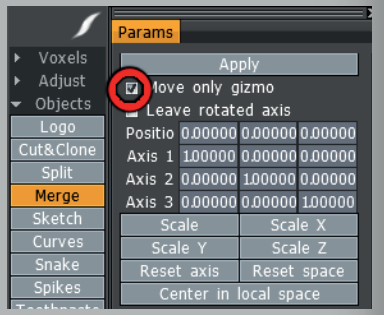
Transform: Allows you to position any merged object with the aid of a "Transform widget". Shift (X, Y & Z). Shifts the un-merged mesh along the selected axis inside a bounding box in local space.

Presets: This tool has a number of presets, you are encouraged to explore them.

Some of the more advanced functions of this tool are as follows:

Merge separate volumes: Merges each sub-object to its own unique Layer in the VoxTree.

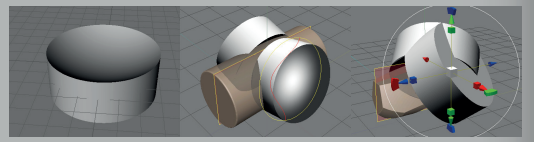
Respect negative volumes: If an un-merged object has "***_negative***" listed in its name - (indicating a "***subtractive***" sub-object inside the file), this function will subtract this volume when merging it with other sub-objects. You should know in advance when you are going to use this feature, as a "***negative***" or ***subtractive boolean*** object. This function is great for creating ***greebles and nurnies.***

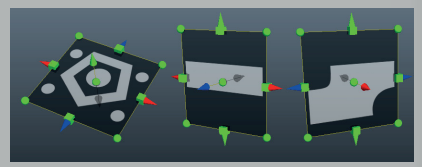


Let's take a more detailed look at this feature. (Thanks to our users Tinker and Daniel Yarmak for the descriptions).

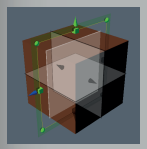
"***Greebles***" or "***nurnies***" can be created in any 3D modeling application, usually with a series of arbitrary extrusions. To make your models look more interesting, you would probably want to create your own unique models for this purpose.

Details with ***angled*** surfaces look better than surfaces which are all-parallel. For easier placement of details on a model, create a contour for the detail -- an object with the name "***_negative***" which subtracts automatically from the model and leaves a slot for the detail. It's important to turn on "R***espect negative volume***" in the ***Merge Params*** Panel to permit contour exclusion. Because the "***negative volume***" width is larger than the width of the detail, we get an interesting effect. There is ***automatically generated*** a joint between the body and the object.

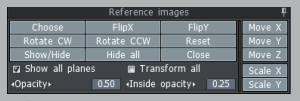




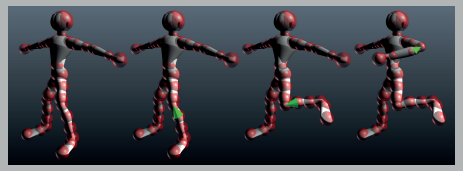
Load the greebles using the "***Merge***" tool. Use the "***On pen***" mode and the "***9***" and "***0***" keys to rotate the brush.

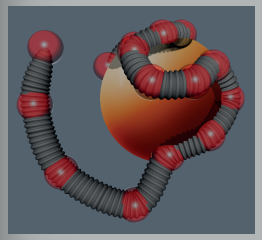


Sketch: This new tool is a very important addition the the toolset. It lets you create a volume object with 2 or 3 images -- if you use 3 images, the voxel object will be more detailed. Please try this new tool out, it is great for creating basic shapes for a more detailed objects very quickly. This tool has a few operations, all of which are self-explanatory -- please explore the options for this tool.



Curves: The "Curves" tool is easily one of the most powerful tools in the voxel arsenal, as it lets you place spline points directly into your scene with the LMB.To edit an existing point, simply click with the LMB. To ESCape from editing a point, hit your ESC key. This tool also uses a gizmo for transformations. The arrows will translate, the boxes will scale or stretch, the inner white ring will translate on all axes. When using the function Apply to whole curve there will be an outer white ring which allows for viewport based rotations. In addition to the standard curve tools described above, there are now 4 modes:

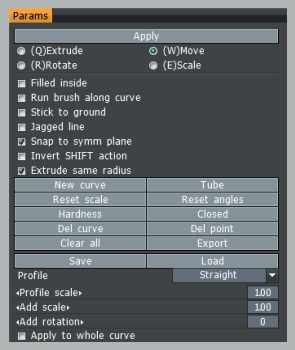




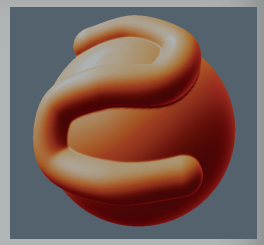
Extrude: Lets you extrude new hierarchies from the existing point of a curve. Simply click and hold the LMB, then drag in the direction you want to create the extrusion. Holding SHIFT will default to the new Rotate mode. It can also be activated with the "Q" key.

Move: Lets you move points of a curve individually. Adding the SHIFT key will move its child or parent hierarchy, depending on the direction of the manipulator arrow. It can also be activated with the "W" key.

Rotate: Lets you rotate the child or parent hierarchy of a point with viewport based rotations. It can also be activated with the "R" key.



Scale: Lets you scale the child or parent hierarchy of a point. It can also be activated with the "E" key.



NOTE: You need to click the LMB to edit a point, esc to stop editing a point. When using one of the four new edit modes, you do not need to have a point selected. Simply hold SHIFT (or turn on Invert SHIFT action) and you'll see green cones -- they let you edit the point and its hierarchy. Finally, the affected direction of the hierarchy is the larger side of the green cone.

These tools allow for quite a number of things, including pipes, chains, basic character or creature shapes and bodies, and so on. Here are some of the parameters of this tool:

Fill Inside: Fills the entire space between all points to create a solid volume object throughout the entire space.

Run brush along curve: Lets you perfectly indent or protrude areas along the spline. It has a number of options which are all self-explanatory -- please explore these settings.

Conform: Forces the points of your curve to be constrained to the surface of a volume object you drag across.

Jagged line: By default the curves tool will create a smooth TCB-spline. But with this option you can create a linear spline, essentially creating "pointy" intersections.

Snap to symm plane: Forces newly created points to be created on the symmetry plane when you click on or near the plane.

Invert shift action: This exclusively effects the four new curve modes. By default in any of these modes you must hold SHIFT to perform their alternate functions. This option will invert this setting, so that by default you use the alternate functions, and the normal default methods require you to hold the SHIFT key.

Extrude same radius: In the Extrude mode, this option creates a new point with the same size as the point that you extruded from. By default a newly created point is the size of your pen cursor.

New curve: Adds another curve to your scene, in addition to your existing curve(s).

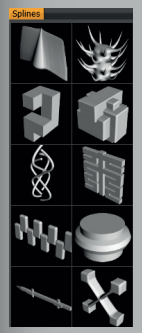
Tube: Resets the curve back to its default state.
Reset scale/angles. These two tools will reset any scaling or rotations you have applied to the selected curve.

Hardness: To use this you must have a point on a curve selected, then, by pressing this button, the selected point will become sharp and pointed.
Closed. Closes the spline curve between the first and last points on the spline. You can of course still add or remove points while using this function.

Del curve/point: These two functions allow you to delete curves and points on a curve. You can also hover over a point on a curve and hit the DELETE key.

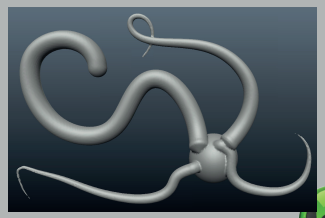
Clear all: Clears all curves from the scene.

Save/Load: You can save and load entire sets of curves for use at a later time, or for distribution to other users.



Profile: This drop-down list contains a number of profiles, each will change the overall shape of the spline curve.

Apply to whole curve: With this any rotations, scaling or translation will apply to the whole curve centered from your current selected point on the spline. The gizmo for the point will change, adding a new large, white circle around the rest of the gizmo. This new circle will allow for viewport based rotations.



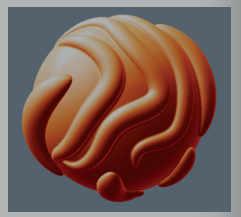
Spline presets: There are other, and hopefully self-explanatory, settings for this tool. But one thing you should definitely explore are the spline presets. These let you perform many unique voxel sculpting techniques and styles. You can also add your own by using external files in the .OBJ or .LWO formats.

Snake: Clicking and dragging with the LMB creates a snake-like shape in your viewport. Its position is based on your first click and your viewport perspective. As with the curves tool, you can reset it with the Tube button. You can select a number of profiles and of course also use spline presets. One unique parameter for this tool is the Smoothing speed. The snake will smooth along its entire length, causing it to move. The higher the value, the more smoothing. (Min/max values: 1-5)

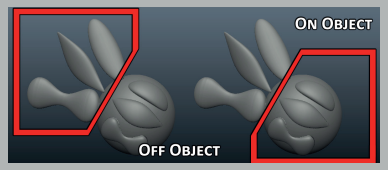
Spikes: Functions exactly like the snake tool, except that it tapers on the end point, causing a spike-like appearance.

Muscles: Lets you easily sculpt muscle- and tendon-looking shapes. You can achieve many different effects by, for instance, sculpting with this tool outside of a volume to create objects that look like wings.
There are a number of settings in this tool:

Smoothing Speed: Lets you adjust the rate at which your stroke is smoothed.



Conform: Forces your stroke to adhere to the surface of the object, instead of passing in front of the base object, or right through it.



Muscle types: Select between two different types: Muscle and Tendon.

Toothpaste: This tool shares all of the options with the Muscles tool except the muscle types. Its function is similar to its name: it is just like applying toothpaste to a surface. A big advantage is that it respects Pen alphas, so you can use it to create some rather unique rake brushes.

Primitives: This tool has undergone a big change in version 3.2. While retaining the oldrer primitives (Sphere, Cube, Ellipse, Cylinder, Cone, Capsule, Tube, N-Gon and the Gear), there are now Free Form Primitives (***ffPrimitives***)! These robust and powerful primitives let you create very complex shapes with just a few easy tweaks of the vertices, edges or faces of the lattice cage. There are a number of preset ffPrimitives, and you can also create your own using .OBJ files -- see more on that below. A few of the parameters for the new ffPrimitives are as follows:

Transform as whole: Gives you the ability to translate, rotate and scale using the default transform tool.

Local Symmetry: Enables local symmetry of the ffPrimitive, which gives you more creative freedom and control.

Misc. ResetPrim: Lets you reset any changes you've made to the object.

EditPoints: Allows numerical values for each visible point of the lattice cage. Inner/Outer Radius & Thickness are only applied to some of the ffPrimitives, such as ffDisc and ffTube, they allow for the radius of the inner section or outer section of the tube and the thickness of some of the primitives with keyable values. The drop down list also has a few more options, usually different .OBJ files with different cages for similar shapes, such as ffDisc. When holding "***Ctrl"*** you can constrain the movement of your selection along its ***normal***.

Text: Lets you place text along a spline curve, and create text in voxel form. Its parameters are identical to that of the Curves tool, so you should already be familiar with it after reading that section above. It has a few unique features: You can select a font for your text, you can of course type in the text you would like to make volumetric, and you can adjust the thickness of this volumetric text.

Cloth: This tool is a cloth ***simulator*** which you can use to ***drape*** a polygon mesh over another object. There is a default Cloth with which you can test, but you are not limited to this as you can also import an external polygonal mesh. The parameters for this tool are:

Select mesh: Prompts you with a file-open dialog which lets you select a file (***.OBJ, .LWO, .FBX, .STL, .PLY, and .3b***) on disk to use as the object to be draped.

Subdivide: Subdivides the object you have imported. It can be used before or after you run the simulation.

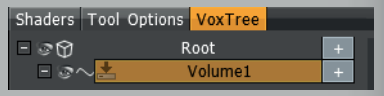
Start/Reset: These two buttons starts and resets the simulation.

Pick from retopo: If you have r etopologized something and it is in the Retopo tab, then you can use this button to select that mesh as the object to drape.

To retopo: Sends the recently draped mesh to the Retopo tab for further retopologization.

Other: Sets a number of other parameters, such as the Gravity, and the Friction of the draped object on the object you are draping over, as well as the Cloth thickness. For thickness, the higher the value, the thicker the cloth.

12.4 Surface Mode & Tools



In version 3.2 of 3D-Coat the surface tools have undergone some major changes, and, as of version 3.5 these tools have inherited all the universal improvements of the Brush Engine, with fantastic enhancements to the existing and new tools. You'll notice speed improvements, throughout.

To change to ***Surface mode***, you must click on the ***Cube*** icon in the ***VoxTree*** for the Layer you would like to edit in this mode. You will then see a ***Wavy line icon*** which represents surface mode. Surface mode is much faster for sculpting than the regular volume mode.

Surface mode was designed to give users the ultimate ***speed boost*** for sculpting, by ***temporarily*** converting a voxel sculpture to surface polygons. You can switch back and forth between standard Voxel mode and Surface mode as often as you like. Though the tools are similar to their voxel equivalents, they are generally faster to use on dense models, as well as providing effects that can't be reproduced, ***economically***, in standard Voxel mode. We've also included the ***Pose, Move and Transform tools*** in this mode.
Here is a description of the tools, in detail:

Draw: The Draw tool is great for quickly adding spontaneous detail. It is similar to the the Airbrush tool, but it only operates on the surface of a volumetric object.

Smooth: Produces much more dramatic smoothing than can be achieved with the standard Voxel equivalent.

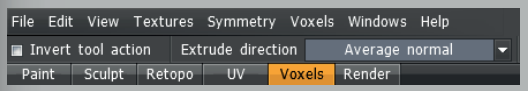
Pinch: Surface Pinch is identical to the Voxel Pinch tool, but it is faster and only operates on the surface of a volumetric object.

Shift: This tool drags the surface topology along with the brush. It's great for producing ***wrinkles*** on a character or for making ***cloth***. It is identical to the Vox Follow tool, but it only operates on the surface of a volumetric object.

Flatten: This tool has been improved in version 3.2, and now allows for a more predictable behavior. It flattens the area underneath your brush, based on brush size and intensity.

Chisel: Similar to the Flatten tool, but it's effect is less extreme and provides some irregularity along the stroke.

Clay: Surface Clay lets you quickly and fluidly apply mass to your voxel sculpture. The difference between this tool and the Carve brush is that it will also simultaneously smooth the surface after you've brushed it, giving it an authentic clay look.



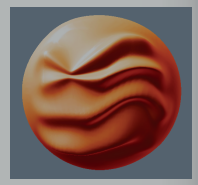
Fill: Surface Fill is a great way to fill in small voids and gaps in your objects. It is especially effective at very high settings.

Expand: Expands all vertices outward, uniformly, to a given radius.

At the top left of the interface are the **Extrude Direction Settings**. This allows for user definable extrusions. The extrusion methods are as follows:

Average normal, View direction, Along axis (X, Y or Z), Vertex normal & Initial vertex normal.

These settings are unique to the following ***three*** tools:



Extrude: Extrudes along the surface under your brush, based on your pen Size, Depth and Extrude direction settings.

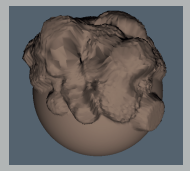
Gum: This tool is great for making nice details on a mesh. It is unique for the surface tool set. It's the fastest way to make skin, pores and wrinkles. The higher the resolution of your object, the better the details look. This tool is commonly used to sculpt minute details onto an object. It is affected by the Extrude direction settings.

Absolute: Extrudes the surface based on your Brush ***Size, Depth*** and ***Extrude direction settings***, while also maintaining the underlying surface details and topology.

Freeze: A very useful ***masking*** tool, which allows you to define areas to be avoided by sculpting tools, or inverted to be the focus area for sculpting. The common shortcuts are "***Ctrl+Shift+ I***" (inverts your selection) and "***Ctrl + D***" (which deselects it).

Rapid & Rapid2: This tool's name is very descriptive, as it's one of the fastest tools in 3D-Coat to sculpt general shapes. It is almost the opposite of the Gum tool in this regard, as it ***doesn't*** respect ***Brush alphas*** but only brush ***Size*** and ***Intensity***. Another great thing about this tool is

that if you have two voxel objects in the viewport that are separated from each other in space, it will try its best to form a ***bridge*** between them (***welding*** them together as one object).



Scratches & Scratches2: Provides a similar effect which clay sculptors use to "rough out" surface features quickly.

Mud & Mud 2: An interesting surface texture effect, providing rough edges.

12.5 Surface Adjustment Tools

A small subset of those same tools that appear in "Standard Voxel mode, offering faster response due to the nature of polygonal surface meshes, which are at the heart of the Surface mode.

12.6 Surface Commands

There are only a few Commands in the sidebar, but they are all very important. Let's take a look:

.

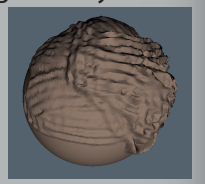
Resample: This command quadruples the number of voxels in the current object Layer. This lets a Layer have much more detail. You can view the resolution of a Layer in the VoxTree directly before the Layer's name. If it has only the name, that means the Layer's resolution has not been increased.

Clear: This command clears the ***current Layer*** in the VoxTree of all voxels. It is useful when you wish to keep the current Layer's name and resolution -- but not the voxels objects in it.

Smooth all: This command ***uniformly smoothes*** all of the voxels of the ***currently selected*** object Layer in the VoxTree.

12.7 The VoxTree

You have the ability to drag and drop Layers for several different purposes, such as moving a Layer to the trash, re-parenting by dragging to a Layer's + sign, or simply reordering the Layers to organize them. These functions involve the primary Vox Tree icons. Let's take a look, in detail:



Collapse child Layers: The minus next to any Layer lets you collapse any child Layers it may have.

Root: This is the base file or scene. You cannot edit this.
Visibility: By clicking the Eyeball icon you can toggle the visibility of a Layer on or off.

Cube/Wavy line: These icons toggle between volume mode and surface mode. Volume mode is represented by the 3D cube icon, surface mode by the Wavy line icon.

Cache/Uncache: Represented by two icons, which toggle when clicked. One looks like a hard disk drive with an arrow pointing downward to it, the other and upward arrow which curves to the right. These icons will toggle proxy mode and will apply any changes made from the low resolution proxy to the high resolution sculpture.

Add Layer: The plus sign next to any Layer will add a new child Layer. If you add a Layer to the root, it will have no parent.

Layer name: Each Layer is represented by a horizontal bar. By double-clicking the bar you can change the Layer's name.

Layer resolution: If you have changed the resolution of a Layer, there will appear a number representing this change, like [2x], [4x], etc.
Now let us look at the icons on the bottom of the VoxTree:

Blank sheet: Creates a new child.

Trash can: Deletes your currently selected Layer.

2 Blank sheets: Duplicates your currently selected Layer.

Ball: Edits the currently selected Layer's shader properties.

2 Blank sheets w/grid: Duplicates the currently selected Layer's resolution and transformation settings. Nothing else will be duplicated. This is useful when you need a new Layer with the same settings but not the same voxels.

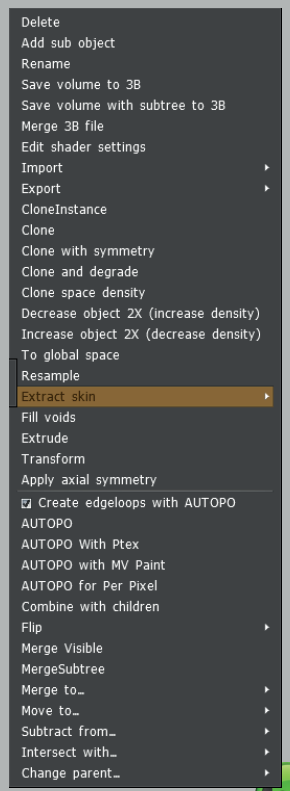
Double-sided arrows: This icon is for the Symmetry copy tool. If you have sculpted on one side of a volume object you can use this fuction to copy all your work to the other side of the object. It works on any axis, as long as you have symmetry turned on along the preferred axis.

Grid: Increases resolution.

Sheet w/ down-arrow: This icon duplicates your currently selected Layer and decreases its resolution by a factor of 2. This is useful if you have an object Layer with too high resolution and you need to reduce it for easier editing. Be aware that you will lose details!

Sheet with "X": Clears the selected object Layer in the VoxTree of all voxels. It is the same function as the Clear tool on the left side tool bar, as discussed in the Commands section.

Individual voxel layers now can be exported as single .3b file:



12.8 VoxTree Right-click Menu

There are many functions in the right-click menu inside of the VoxTree. Some of them are unique to this menu, most however, are not. They are as follows:

Delete: Deletes the selected Layer.

Add sub object: This is the same as clicking the "+" icon near the Layer's name. It adds a Layer that is a child of the current Layer.

Rename: Type your own name for the Layer, instead of the default "Volume XXX".

Save volume to 3B: Saves the voxel volume ***without*** its subtree to the 3D-Coat ***native file format***.

Save volume with subtree to 3B: Saves the voxel volume ***with*** its subtree to the 3D-Coat native file format.

Merge 3B file: Merges an external .3B file into the scene.

Edit shader settings: Edit custom shader's parameters, if it has them.

Import:

Merge points cloud: Merge set of points as a sequence of a small spheres.

Export:

Export scene: Exports the whole scene as a set of separate objects.

Export object: Exports the current object.

Export pattern for merge: Exports the current object to be used as a pattern for the Merge object tool.

Export curve profile: Exports the current object as a profile for a curve.

Clone instance: Clones and transforms an instance of an object.

Clone: Clones and transforms a voxel object.

Clone with symmetry: Clones with symmetry and transforms.

Clone and degrade: Clones and decreases density twice.

Clone space density: Creates space with identical density and transformation. It is important if you want to use the Copy tool without loosing quality.

Decrease object 2X: Increases the selected object Layer's density twice. Object will decrease twice.

Increase object 2X: Decreases the selected object Layer's density twice. Object will increase twice.

To global space: Moves the object to 0 on all axes. This is great when you need to move something directly into the center of world space to allow for a more perfectly symmetrical object when symmetry is active.

Resample: Duplicates the same command present in the S***urface Tools***.

Extract skin: Makes a hollow skin based on a solid voxel sculpture. There are 2 versions of this function - "**Make hull using voxels**" and "**Make hull using surface**". The former is more accurate, but takes longer to perform while the latter is faster and less accurate.

Fill voids: Makes any voxel object a contiguous solid, which is necessary for creating proper topology - either automatically or manually.

Extrude: Extrudes all objects in the current layer outwardly by a specified amount. Enter this amount in the Extrusion parameter Dialog.

Transform: Transforms a whole object using a special gizmo.

Apply axial symmetry: Applies axial symmetry of any kind to the object.

Create edgeloops with AUTOPO: Attempts to create edge loops based on the underlying surface topology, when using the AUTOPO tools. Various auto-topology methods are mentioned below.

AUTOPO: Using a "quad dominant algorithm", this routine creates surface topology based on your specifications, and places the resulting polygon mesh in the Retopo Room for further modification or refinement.

AUTOPO with Ptex: Runs the routine mentioned above and places the resulting mesh in the Paint Room for painting using Ptex.

AUTOPO with MV Paint: Runs AUTOPO and places the result in the Paint Room for painting with the "**Micro-vertex**" method.

AUTOPO for Per Pixel: Runs AUTOPO and places the result in the Paint Room for painting with the "**per-pixel**" method.

There are a few things to note about the AUTOPO tools. It is a good idea to enable symmetry planes to **force symmetry** during the process of creating automatic topology - (assuming you want a symmetrical object). If the object is not fully symmetrical, the program will keep symmetry only whenever possible. If you do not like the automatic result, you can always go to the Retopo Room to manually adjust the mesh to suit your needs. Also, when using this function, 3D-Coat will automatically create a new sub-object in the Paint tab for each object layer in the VoxTree.

Combine with children: Combines all child layers of a parent layer, into a single layer.

Flip: Flips the current layer on any axis (X, Y, or Z).

Merge Visible: This will merge all objects in the VoxTree that are not hidden to the current layer - leaving all visible layers intact.

Merge subtree: Merges all sub-layers to the parent layer, deleting the sub-layers in the process.

Merge to: Merges a copy of the current layer to a specified layer.

Move to: Moves the current layer to another layer.

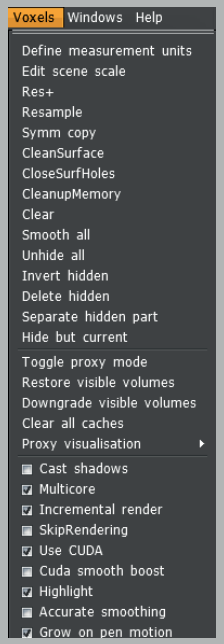
Subtract from: Subtracts an object in the current Layer from the object in another layer that you select. This is a very powerful function in 3D-Coat: it

allows **boolean subtractions** of one object Layer from another.

Intersect with: Adds an object in the current layer from the object in another layer tha tyou select. This is similar to "**Subtract from"**, but allows **boolean additions.**

Change parent: Changes the current Layer to another Layer or to the Root.

12.9 The Voxel Menu



Like most of the other major Tabs (or Rooms as they are also called), there is also an accompanying menu. We have already covered most of these options in previous sections. Any repeated functions are here only for your convenience. Let's take a look at them:

Define measurement units: Specify the measurement of units (Metric or Imperial standards) here in real world scale, and how many voxels per this unit scale.

Edit scene scale: Allows you to redefine the scale of the entire voxel scene. This corresponds to the setting you clicked after merging an object into the scene, and replied "Yes" to the opening dialog.

Res+: This command quadruples the number of voxels in the cur-rent object Layer. This lets a Layer have much more detail. You can view the resolution of a Layer in the VoxTree directly before the Layer's name. If it has only the name, that means the Layer's resolution has not been increased.

Resample: Allows you to adjust the resolution of a voxel layer to an arbitrary number.

Symm copy: If you have sculpted on one side of a volume object you can use this icon to copy all of that to the other side of the object. It works on any axis, so long as you have symmetry turned on along the preferred axis.

CleanSurface: Re-optimizes surface mesh structure.

CloseSurfHoles: Heals any holes found in a surface.

CleanupMemory: Optimizes mesh memory allocation.

Clear: This command clears the current Layer in the VoxTree of all voxels. It is useful when you wish to keep the current Layer's name and resolution but not the voxels.

Smooth: This command uniformly smooths (or relaxes) all of the voxels of the currently selected object Layer in the VoxTree.

Unhide all: Unhides any hidden voxels.

Invert hidden: Inverts any hidden voxels. Delete hidden part. Deletes any hidden voxels. Separate hidden part. Creates a new Layer in the VoxTree and places the previously hidden voxels into the newly created Layer.

Delete Hidden: Deletes the hidden part of the surface.

Separate hidden part: Creates a new volume from the hidden surface.

Hide all but current: Hides everything not selected.

Toggle proxy mode: Toggles on/off proxy mode.

Restore visible volumes: Will recover the high resolution voxel sculpt previously cached, into voxel surface mode. (This is a redundant feature. Using Toggle proxy mode or the icon for said feature, will achieve the same result)

Downgrade visible volumes: Caches the current high resolution voxel

sculpt. (This is a redundant feature. Using Toggle proxy mode or the icon for said feature, will achieve the same result)

Clear all caches: Clears any cached proxy meshes. This cannot be undone,
so use only when needed.

Proxy visualisation: Selects the resolution of the proxy mesh and how far downgraded the mesh is (You can downgrade from 2x, 4x and 8x).

Multicore: Toggles on/off voxel multi-threaded functionality.

Cast shadows: Enables shadow casting based on the global light inside the viewport. It is purely aesthetic.

Incremental render: Renders only the parts of the object that have changed since your previous render, thus giving a large boost in performance. This option is off when shadows are on, as shadows are dynamic and change the appearance of the rendered object.

SkipRendering:

Use CUDA: Employ CUDA acceleration.

CUDA smooth boost: Makes use of special CUDA smoothing.

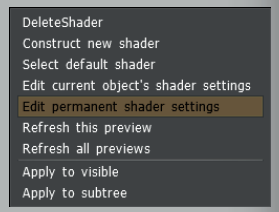
Highlight: Toggles highlighting, if it is turned on for your selected VoxTree object will be highlighted a different color. When off, there will be no visible change. This efffect is dependent on the shader.

Accurate smoothing: Provides more accurate smoothing, at the expense of performance.

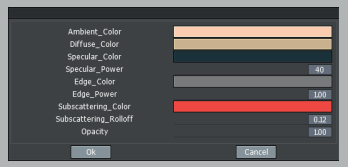
Grow on pen motion:

13.0 Shaders

The shaders tab is pretty straightforward. You simply **RMB** click
to select a new shader to apply. If you RMB click a shader, you'll see a few
options:



Delete Shader: Deletes the shader you clicked.



Construct new shader: Lets you create a new shader. The new
shader will be based on the shader you clicked.

Select default shader: Applies the shader you clicked as the default shader. Whenever a new volume object is created, it will have this new default shader applied.

Edit current object's shader settings. This is pretty self-explanatory.

Please check out each shader's specific settings.

Refresh (all) preview(s). These two options refreshes the shader tab. It is helpful if you have trouble with a newly created shader not showing up as a selection.

13.1 Multi-Resolution & Caching

Using this method for sculpting speeds voxel sculpting up, considerably, and provides much less hindrance when you're in a working mindset, allowing for minimal interruption. Essentially, you cache your high resolution voxel sculpt to disk, then proceed to sculpt on the low resolution proxy that **3D-Coat** automatically generates for you. Any changes made to the low resolution object will be propagated upward to the high resolution sculpture.

This method is quite similar to what you can achieve now with voxel surface mode, however, using this method you can choose the resolution of the proxy mesh. In this section is placed all relevant information regarding Multi-resolution and caching. Some of this information may be redundant, but is all compiled in this section for your convenience.

Apply to visible: Only apply the selected shader to visible objects.

Apply to subtree: Applies the selected shader also to subtree objects.

Toggle proxy mode: Toggles on/off proxy mode.

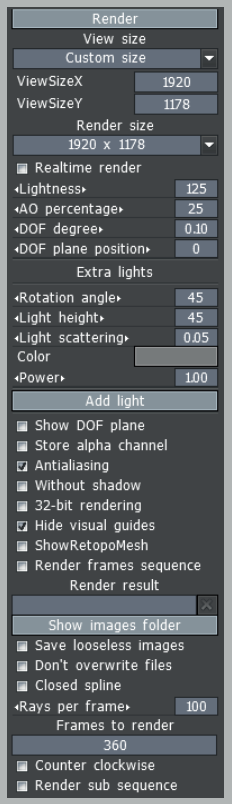
Restore visible volumes: Will recover the high resolution voxel sculpt previously cached, into voxel surface mode. (This is a redundant feature. Using Toggle proxy mode or the icon for said feature, will achieve the same result)

Downgrade visible volumes: Caches the current high resolution voxel sculpt. (This is a redundant feature. Using Toggle proxy mode or the icon for said feature, will achieve the same result).

Clear all caches: Clears any cached proxy meshes. This cannot be undone, so use only when needed.

Proxy visualisation: Selects the resolution of the proxy mesh and how far downgraded the mesh is (You can downgrade from 2x, 4x and 8x).

Multicore: Toggles on/off voxel multi-threaded functionality. **Cache/**



Uncache. Represented by two icons, which toggle when clicked. One looks like a hard disk drive with an arrow pointing downward to it, the other and upward arrow which curves to the right. These icons will toggle proxy mode and will apply any changes made from the low resolution proxy to the high resolution sculpture.

14.0 The Render Room

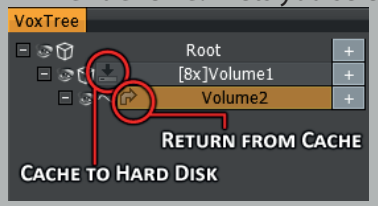
In this section we shall discuss all that relates to the **Render** tab in **3D-Coat**. First, one important point: do not hit esc to cancel a render if you still wish to use the image! You must wait until it is complete if you wish to have a final, useable image. Cancelling the render will not do this. The render engine must be allowed to continue its work until the render is complete!

14.1 Render Panel Functions

Render: Initiates the render of your frame or frame sequence.

View size: Lets you choose between rendering the Whole screen or a Custom size. If you choose a custom size you can then key in the X and Y values of the area you wish to render.

Render size: Lets you select a size for the rendered image. It is only active if you are using a custom size from the View size drop-down list. It will always be in multiples of the size you choose as the custom size.



Lightness. If you increase the value of the **AO percentage** you will probably need to also increase the **Lightness** of your scene, or it be be too dark.

AO percentage. The ambient occlusion changes your lighting type. A value of 0 gives you direct lightening, a value of 100 gives you completely "overcast" lighting.

Light scattering. Adjusts the amount of light that will be scattered.

Higher values will give you softer shadows and softer specularity on shiny objects.

DOF degree. Depth of field focus. Produces a "lens focus effect" on your image. Set the distance from the DOF plane where objects remain in focus.

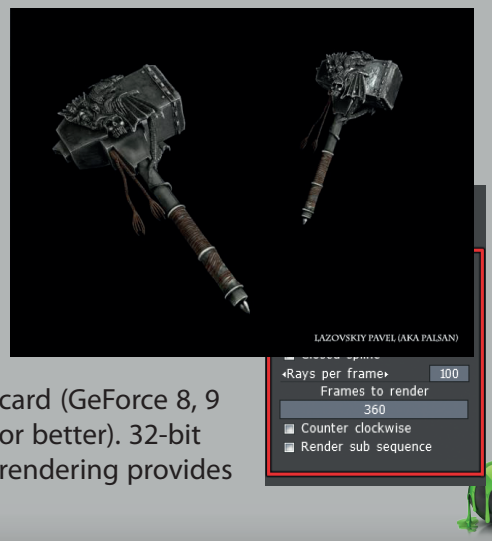
DOF plane position. Moves a red plane forward or backward to set the center of the depth of focus. Use the slider above to set the distance from the plane (in front and back) where objects should remain in focus.

Show DOF plane. Shows a focus plane where the details will look mostsharp during DOF rendering.

Store alpha channel. Renders also an alpha channel. To use this option you must choose **.TGA** as the output file format. If you are rendering an image sequence, the **.TGA** format will be chosen automatically.

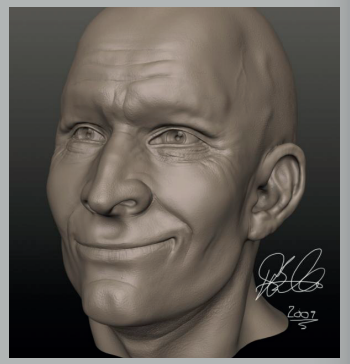
Anti-aliasing. Smoothes the edges of your rendered objects. Keep it checked!

32-bit rendering. Use this option only if have good enough graphic



card (GeForce 8, 9 or better). 32-bit rendering provides a higher quality render by allowing for an "infinite" number of rays.

Render result. Choose the image format and a folder to store your rendered scene. Only apples if **Render frame sequence** is unchecked.



Render frame sequence. Renders a frame sequence rotating around the object or along the camera path. If checked, an additional parameter will appear:

Folder to store images. The name of a folder that will be created to store rendered frames. The folder is placed into **Install dir/**

RenderedImages/...

Please note that you cannot change this default path.

Save lossless images. Saves images in lossless formats, namely **.TGA** and .bmp.

Don't overwrite files. Prevents overwriting of files during a sequence rendering.

Closed spline. Use if you have several camera shortcuts set up in the scene. In this case the **Camera flight** trajectory will be closed.

Rays per frame. Sets the maximal number of rays per frame during rendering. The rendering time is proportional to this value.

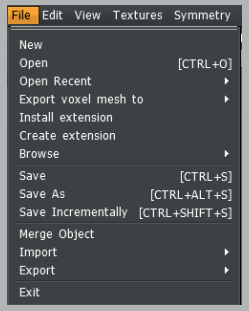
Frames to render. Sets the number of frames to render.

Counter clockwise. Sets trajectory direction: clockwise or counter-clockwise.

Render sub sequence. Check if you want to render or re-render only some frames of a sequence. You must set the first and the last frame to render. As mentioned in the beginning of this section: do not hit esc to cancel a render if you still wish to use the image! You must wait until it is complete if you wish to have a final, useable image. Canceling the render will not do this.

15.0 3D-Coat Main Menu Panel

15.1 File:



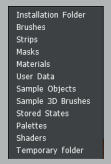
New. Clears the current scene and creates a new one.

Open. Opens 3D-Coat's native .3B format.

Open Recent. Displays recently open files.

Install Extension. You can create whole packs of resources, from brushes, masks, materials and more, into one single file. The format is **3DCPACK**. This allows for easy distribution of said files, to other users! Tocreate a pack, use the **Save Extension**. It will run a wizard to help you create such packs, and also prompt you for a **.txt** file which contains any licensing you wish users to adhere to for your 3DCPack. Using the **Install Extension** prompts you to select a **.3DCPACK** file to install.

Create Extension:



Browse: Search all available 3DC resource folders.

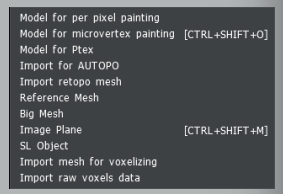
Save. Saves file.

Save As. Saves files in **.3B** format. You can rename the file or place it into another directory.

Save Incrementally. Saves the file with an iterational file name, for example, "file_001.3B", "file_002.3B".

Merge Object. Merges additional objects into the scene. Caution: Don't merge objects with very different scales!

15.2 Import:



Model for per pixel painting. Imports a mesh to paint directly over pixels in a UV-set. This approach will give better quality of painting over a texture because the painting will be performed directly over pixels in a UV-set. Use this for normal maps and texture maps.

Model for microvertex painting. Imports a mesh for use with the microvertex sculpting and texturing tools. Use this for displacement maps and vector maps.

Model for Ptex painting. Imports a mesh for use with the Ptex texture painting and UV tools. Use this if you wish to paint extremely high resolution details and not worry about UV mapping. Ptex is a new method for texture painting and UV mapping. For more information on Ptex, see the Ptex section of this manual.

Import for AUTOPO: Imports a mesh for instant access to automatic topology parameters.

Import retopo mesh: Imports a mesh directly into Retopo Room.

Reference Mesh. Imports the mesh to use as a reference for the retopology tool.

Big Mesh. Imports a large mesh (up to 16 million polygons). This function requires two meshes; a low-poly reference mesh and a high-poly mesh. Both should have the same non-overlapped **UV-set.** First import the low-poly mesh into scene using the usual import

dialog, then load the high-poly mesh using this option.

Image Plane. Loads a flat square object and applies color and depth

images for bump mapped tiled textures. Edit 2D images and add relief to them. Using the **Image Plane** tool together with **Textures** and the **Offset tool** you can loop the textures. Currently only square textures are supported. This option is very useful to make tiled displacement textures.

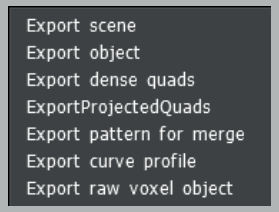
SL Object. Import sculpt map from **Second life**.

Import mesh for voxelizing: Imports a mesh directly into the Voxel Room.

Import raw voxel data: Imports a specific voxel file format into the Voxel Room.

15.3 Export:

Export Mode. Export the current object to **.OBJ**, **.LWO**, **.STL** and **.PLY** formats. You will be prompted to select either a low-poly mesh, or a mid-poly mesh with 30k to 80k polygons and the normal map. If you're in the **Microvertex painting mode**, the **Export** menu will have additional options:



Export scene: Exports all the objects in a scene.

Export object: Exports a single object.

Export dense quads: Exports a high quality quad skin of any voxel object.

Export projected quads: Exports a quad mesh similar to Zbrush's Dynamesh.

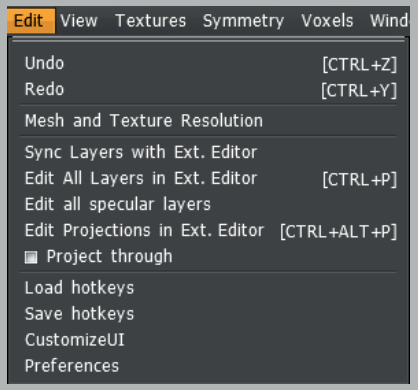
Export pattern for Merge:

Export curve profile: Export the current curve data produced with "E" panel tools.

Export raw voxel object: Exports a voxel object in specific voxel file format.

Exit. Exits the program.

Edit:



Undo.

Redo.

Mesh and Texture Resolution. Changes the number of polygons in the object and the size of the texture. You can change mesh resolution multiple times (like with other 3D software), but you can also do it in percentages, for example 50%.

Sync Layers with Ext. Editor. Lets you synchronize the current Layer with an external editor. You can set the file path to the editor in the

By default it is Adobe Photoshop. The alpha channel will contain the transparency mask. With this command the image editing program will open automatically with your file. Then you can edit it and jump back to **3D-Coat** by pressing "**CTRL+S**".

Edit All Layers in Ext. Editor. Edits all Layers in an external editor. You can set the file path to the editor in the ***Preferences***. By default it is Adobe Photoshop. This image editor should be able to edit **.PSD** files. The texture will be stored with Layers to the **.PSD** file, then the image editor will start. You can edit the texture and even add new Layers. When you save the file, **3D-Coat** will automatically reload it.

Edit all specular layers: Specific access to only edit info found on specular layers.

Edit Projection in Ext. Editor. Edit the current projection in Adobe Photoshop, or any image editor, using Layers. You can set the file path to the editor in the **Preferences**. By default it is Adobe Photoshop. This image editor should be able to edit **.PSD** files. The projection will be stored with Layers to the **.PSD** file, then the image editor will start. You can edit the projection. When you save the file, **3D-Coat** will automatically reload it.

Project through: Allows use of specific tools through all visible layers.

Load hotkeys: Loads your custom hotkeys from disk.

Save hotkeys: Saves your custom hotkeys to disk.

Customize UI: Allows you to hide or show any menu or interface item.

15.4 Preferences:

Show beta tools: Allows testing of any tools not yet in the main release.

Autosave. The slider **"Autosave time"** adjusts the time interval for autosaving. The autosaved file has the name "autosave.3B," which is located in the folder "User Data".

External 2D-editor. The application in this file path is used to edit 2D-images. This editor must be able to edit **.PSD** files, so usually it would beAdobe Photoshop (but it could also be Corel Painter, for instance). This editor will be called by the functions **"Edit," "Sync Layers with Ext. Editor, Edit All Layers in Ext. Editor** and **Edit Projections in Ext. Editor"**.

Near plane modulator. Tweaks the camera near plane to be able to move it closer to the surface.

Show hints. Hides or shows hints. Hints are located at the bottom of the viewport.

Axis. Shows or hides the axis.

Show "Focal shift" in the top panel (Show **"Focal shift"** slider in top panel).

Show "Falloff" in top panel (Show **"Falloff"** slider in top panel).

Compact interface. Toggles between compact/full interface.

Show import thumbnails on start page.

Show interface thumbnails on start page.

Also you can specify:

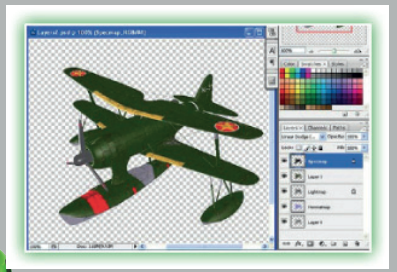
Screen space grid size. 2D-grid size.

Grid subdivision. 2D-grid subdivision.

Background type. Vertical gradient/Background image/Panorama.

Background image.

Sky box image.



Top background color.

Bottom background color.

Screen grid color.

Grid color. 3D-grid plane color.

Interface color.

Headers color.

Text and white icons color.

Edit area color.

Edit area border color.

Edit area highlight color.

Active tab color.

Passive tab color.

Tab background color.

Active tab font color.

Headers font color.

Buttons color.

Highlight color.Hint background.

Hints text color.

3D button style. Uses 3D style for buttons.

Gradient in menu. Uses gradient style for menu.

Environment sphere map. Chooses a sphere map used for **Show model with environment map.**

Slightly lower shader quality. Select this option if you experience performance problems.

Use multi-core optimization.

Use MRT. Uses multiple render targets to speed up real-time normalmap updates.

Pen sensitivity. Adjusts Pen sensitivity if you are using a digital pen.

Camera zoom speed.

Camera rotation speed.

Freeze pattern scroll speed. Freeze pattern scroll speed. You can change 'the freeze preview patterns in the freeze menu.

MOUSE WHEEL. Which parameter to change with **MOUSE WHEEL**.

CTRL+MOUSE WHEEL. Which parameter to change with **CTRL**+ **MOUSE WHEEL**.

SHIFT+MOUSE WHEEL. Which parameter to change with **SHIFT**+**MOUSE WHEEL**.

ALT+MOUSE WHEEL. Which parameter to change with **ALT**+**MOUSE WHEEL**.

Here is a list of suggested parameters for the last four options:

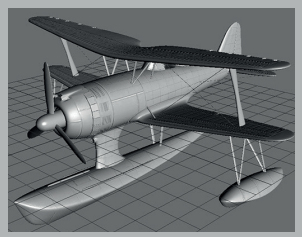
Normal maps export. Selects the standard for normal maps exporting: **3D-Max** or **Maya**.

Padding. When you export textures you will be asked if you need a border around the texture clusters (padding). This option lets you answer the question automatically.

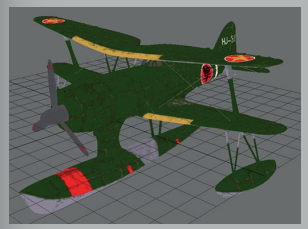
Padding width. Used when texture exporting.

3DConnexion options. 3D-Coat supports the 3D SpaceNavigator from 3DConnexion. You can find all the options to control your 3D mouse here.

15.5 View:



Relief only. Displays relief maps only in the viewport.



Flat shade. Displays a flat shaded view in the viewport.

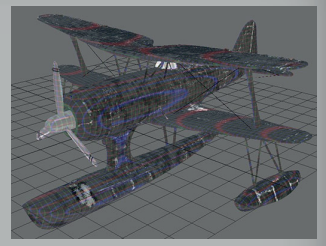
Specular only. Displays only your specular maps in the viewport.

Show displaced mesh. Shows actual mesh displacement. The vertices of

the mesh will be displaced along the normal in correspondence with the

displacement map.

Wireframe. Shows the wireframe of the model.
Low-poly. Views and edits low-poly model with normal map.



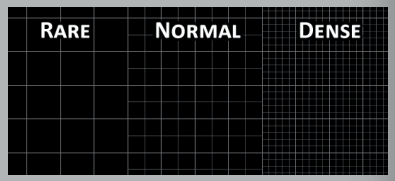
Smooth Shade. Enables **Smooth shade** (hot key **"5"**).

Low Smooth Shade. Enables **Low Smooth Shade** (hot key **"7"**).

Environment Shade. This is the default. It displays all the maps you have

applied in the viewport.

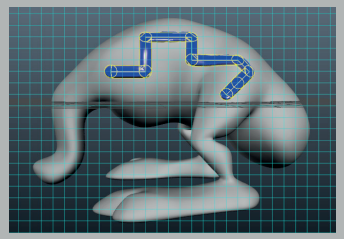
Grid. Turns on/off the 3D-grid plane in the 3D viewport.



Grid density. There are 4 levels of density for the grid. Rare, Normal, Dense and Custom. With custom, you can set the number of major lines and the number of minor lines between the major lines.

Axis. Shows/hides the axis.

Grid 2D mode. Turns on/off the 2D-grid of the screen. You can key in values for rotation, pan and zoom for more accurately grid placement.



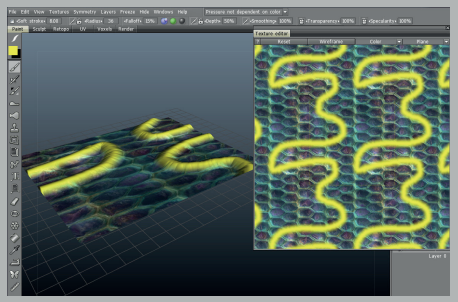
Snap to Grid. Snaps to the 2D grid. This is usually used in conjunction with the **Curve** tools (draw with spline, putting text on curve and putting picture along spline). With **Snap to grid** on you can snap the points of the curve to the 2D-grid and draw very exact shapes.

Snap to low-poly vertices. Snaps your pen to low-poly vertices. Helpful when you are retopologizing or texturing.

Orthographic Projection. Toggles perspective/orthogonal projection.

Adjust subpatching. Improves the visual appearance of mesh displacement using subpatches. Subpatching is a grid NxN on every face. Use this option only if you are certain your video card is powerful enough.

15.6 Textures:



Import. Import color/diffuse in **.TGA**, **.BMP**, **.PNG**, **.JPG**, **.DDS**, and **.PTX** formats and layers color in **.PSD** format. Imports pecular in, **.TGA**, **.BMP**, **.PNG**, **.JPG**, **.DDS** and .ptex formats and specular layers in **.PSD**. Import normal maps in **.TGA**, **.BMP**, **.PNG**, **.JPG** and **.DDS** formats. Import displacement in **.TIF**, **.TGA**, **.EXR**, **.BMP**, **.PNG**, **.JPG**, **.DDS**, and **.PTX** formats. Vector displacement in **.TIF**, **.EXR**, **.TGA**, and **.BMP**. Lastly Depth layers in **.EXR**.

Export. Export color/diffuse in tga, **.BMP**, **.PNG**, **.JPG**, **.DDS** and .ptex formats and layers color in **.PSD**.

Export specular in tga, **.BMP**, **.PNG**, **.JPG**, **.DDS** and .ptex and specular layers in **.PSD**. Export normalmaps (World & Tangent space) in **.TGA**, **.PNG** **.BMP** and **.DDS**. Export displacement for current layer or all layers in **.TIF**, **.EXR** **.BMP** and **.PTX**. Depth layers in **.PSD**. Vector displacement in **.EXR**, **.BMP**, **.TIF** and **.TGA**.

NOTE: When you choose **Import/Export** displacement a context window will appear. In the drop-down list there are four items for map type:

Use Original UV. This option is important for models with overlapped UV clusters, for example with mirrored UV's. In this case you should load the model with the **"Keep clusters"** option on UV-coordinates will be changed in such a way that texture clusters will not overlap each other. Models and textures will be exported with the original UV-set if the option **"Use Original UV"** is checked, otherwise they will be exported with the new UV-set.

Save Specularity as Alpha in Normal Map. Saves the specular channel to a normal map as an alpha-channel.

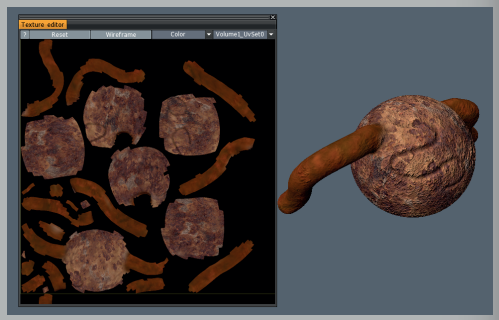
Save Displacement Map to Alpha. Saves the displacement to the alpha channel of the normal map.

Adjustments. There are many Layer adjustments commands, such as: **color to specular, invert color, invert specularity, set height to zero, make transparent, remove specularity, smooth current Layer, sharpen current Layer, hue/saturation/lightness, CMYK, transform color space, brightness/contrast, RGB**. All of them can be viewed with real-time preview and they can be applied not only to the current Layer but also to all the Layers.

Import UV. Imports an object that contains a UV-set. The new UV-set will replace old one.

Export UV. Exports an object without textures. This command could be used in pair with **Import UV**. You can export a UV-set, adjust it externally and then import it again.

Export SL Sculpt Map. Export a **"Second Life"** sculpt map.

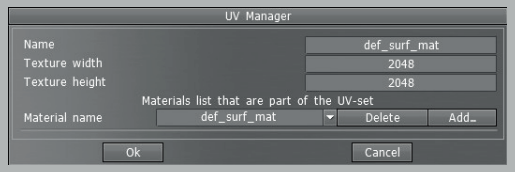


Texture UV Editor. Don't let this wonderful feature slip by. It's like having a mini-Photoshop available right within 3D-Coat. With the built-in 2D texture editor, you can paint in 2D and 3D windows simultaneously. You can paint in 3D and the results will be shown in the 2D window simultaneously and vice versa. From the drop

down menu, you can choose to paint separately on "***Color, Specular,*** and ***Normal***" channels, or your can paint on the "***Shaded***" version of your UV unwrapped texture. You must select a UV-set in the drop-down list at the top left of the 2D Texture editor window to paint in it.

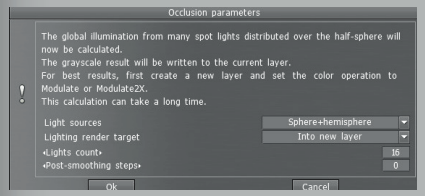
Offset tool. You should load only square images with this tool. It comes in handy to create tiled textures with bump and specular. Once a square object is loaded, you will be offered the **"Offset tool"** window where offset values can be specified: **U offset**, **V offset** and texture shifting horizontally and vertically in accordance.

15.7 UV Manager



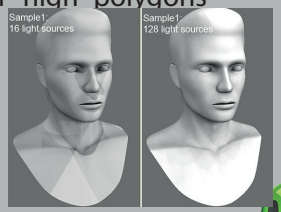
If there are several objects in the scene, separate objects can have a separate UV. Use this command to manage them. You can group several materials into a single UV-set.

Texture Baking Tool. This lets you bake details to a normal or displacement map. This can be used even when the surface topology doesn't match perfectly between your reference mesh and low-poly mesh. This tool is quite detailed and has it's own section below, please see that section for further information.



Calc Occlusion. Allows calculating the global illumination from many spotlights that are distributed over the half-sphere. The grey scale results will be written to the current Layer. So it is better to create a new Layer and set the color operation **"Modulate"** or **"Modulate2X"**. The **Calc Occlusion** tool is especially optimized for high polygons (several millions), it is fast but it still need some time with high polygon counts:

Light sources (distribution of lights).



1) over hemisphere

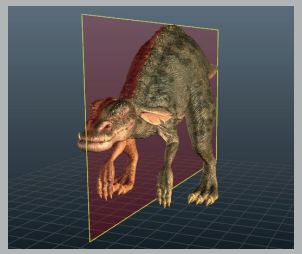
2) over sphere

3) over hemisphere + sphere

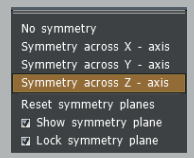
Lighting render target. You must choose a Layer where the occlusion calculation is placed. You can choose to add a new Layer automatically or overwrite the current Layer. In the first case, do not forget to delete a new Layer for the light calculation. Also a new color option **"To time"** is added for a new Layer. In the case of rendering the former Layer, all of its color information will be deleted.

Lights count. The more lights, the longer the calculation. The more light sources, the better the quality of lighting but the longer its calculation. The maximum value is 256, the minimum value is 16.

Post-smoothing steps. Sets the amount of post-smoothing steps after occlusion calculation.



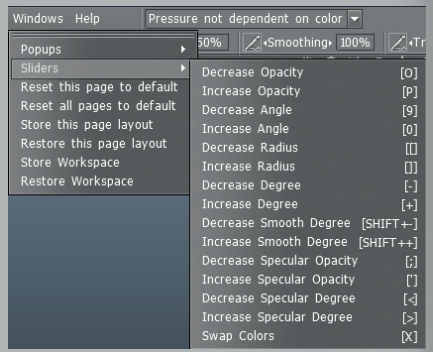
15.8 Symmetry



Symmetry in **3D-Coat** is used when drawing, sculpting or retopologizing objects. For quick access, press the **"S"** key. In this menu you will find a number of settings. You can toggle on/off symmetry, turn on a specific axis for symmetrical work (X, Y or Z axes), or simply toggle the visibility of the symmetry plane. By default, symmetry is not activated. You can also change the position of the symmetry plane by pressing and holding the tab key.

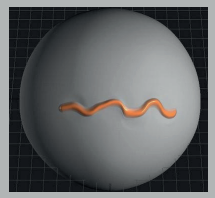
15.9 Windows

Popups. With Popups you can show any popup window in the viewport easily.

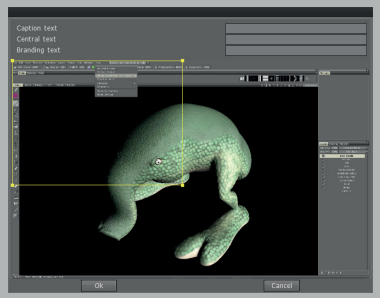


There are many popup windows -- and all of them are useful. Some of the popups are already located in their tabs in the right side panel.

Sliders. View any of the available sliders for all tools that use one. The rest of the options are self-explanatory. You can reset the current **Page** or all pages to their defaults, save your page or whole **Workspace layout** to a file, and also load it when needed.



16.0 Help



Uninstall license. Clicking this will uninstall the license on the current machine you are using.

3D Coat Manual. Will open up this manual.

Upload screenshot. Great for bug reporting directly to Pilgway, especially if you have trouble uploading images to the forums or other locations to show others your screen. Using a yellow bounding box to select the area to capture and upload.

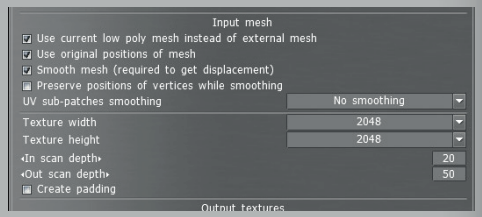
Migration master. Allows you to copy pens, strips, etc. From one installation of **3D-Coat** to another.

Language. Change the interface language of **3D-Coat**. The current languages translated to are: Chinese, English, French, German, Japanese, Russian, Spanish and Traditional Chinese.

Community. Will load the URL of the **3D-Coat** forums. If you need help right away, this is the best way to get help quickly. The users are friendly and always ready to help.

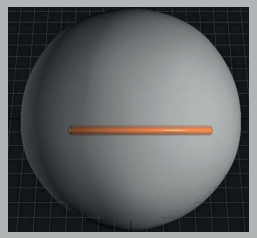
Check for Updates. Will check to see if any updates to **3D-Coat** are available.

About 3D-Coat. Lists the staff, personal thanks and the story behind **3D-Coat**



17.0 Texture Baking Tool

This tool lets you bake details to a normal or displacement map, even if the surface topology doesn't match between the two meshes you wish to bake -- the reference mesh and the low-poly mesh. Here are some detailed steps to use this tool:



For a Displacement map.

Turn on.

Uses current low-poly mesh

Smoothes mesh

Preserves positions

Turn off.

Uses original positions **For a Normal map.**

Turn on.

Uses current low-poly mesh

Turn off.

Uses original positions

Smoothes mesh. You'll need to have **"Use current low-poly mesh** and **"Smooth mesh"** turned on, with **"Use original positions"** turned off. To get a displacement map you should set the **"Smooth mesh"** option, because displacement is calculated as the difference

Legend:
LMB="left mouse button"
RMB="right mouse button"
MMB="middle mouse button"
WHEEL="mouse wheel scrolling"

Standard:
Open (.3b extension): Ctrl + O
Import for Microvertex painting : Ctrl + Shift + O
Import image plane: Ctrl + Shift + M
Save: Ctrl + S
Save as: Ctrl + Alt + S
Save incrementally: Ctrl + Shift + S
Undo: Ctrl + Z
Redo: Ctrl + Y
Copy: Ctrl + C
Paste: Ctrl + V
Apply operation: Enter
Escape from operation: ESC
Swap background and foreground color: X

Viewport:
Rotate: (Alt + LMB) or (LMB on empty space)
Zoom: (Alt + RMB) or (RMB on empty space)
Pan: (Alt + MMB) or (Alt + LMB + RMB)
Fit items to viewport: Shift + A
Reset camera to default position: Home
Toggle Full screen/ standard: Alt + Enter
Toggle Orthographic/ Perspective view: NUM5
Turn on/ off 2D Grid: Ctrl + '
Front view: NUM2
Back view: NUM8
Left view: NUM4
Right view: NUM6
Top view: NUM7
Bottom view: NUM1
Add camera shortcut: Ctrl + Up
Delete camera shortcut: Ctrl + Down
Switch to previous camera shortcut: Ctrl + Left
Switch to next camera shortcut: Ctrl + right

Navigate Screen Materials/ Mask:
Move Materials/ Mask: RMB on empty space
Rotate Materials/ Mask: Ctrl + RMB on empty space
Scale Materials/ Mask: Shift + RMB on empty space
Change aspect ratio of Materials/ Mask:
Ctrl + Shift + RMB on empty space

Model display in paint mode:
View relief only: 1
View non shaded: 2
View specular only: 3
View wireframe: 4
View shaded: 5
View low poly: 6
View low shaded: 7

Model display in voxel mode:
View wireframe in voxel mode: W (hold on)

Quick menu:
Hot box: Space
Draw mode panel: E
Symmetry menu: S
Color picker panel: B
Color channel panel: C
Depth channel panel: D
Specular channel panel: R
Quick panel: ~
Brush panel: T
Material panel: M
Layer panel: L

Brush control:
Hide/show brush circle: Capslock
Turn on/off Soft stroke: Alt + S
Clockwise rotate brush: 9
Anti-Clockwise rotate brush: 0
Pressing out: LMB
Pressing in: Ctrl + LMB
Smoothing: Shift + LMB
Decrease brush size: ([) or (WHEEL down) or
(Right click on model surface and drag left)
Increase brush size: (]) or (WHEEL up) or
(Right click on model surface and drag right)
Decrease brush depth: (-) or (Ctrl + WHEEL down) or
(Right click on model surface and drag down)
Increase brush depth: (+) or (Ctrl + WHEEL up) or
(Right click on model surface and drag up)
Decrease brush smooth degree: (Shift + -) or
(Shift + WHEEL down) or
(Shift + Right click on model surface and drag down)
Increase brush smooth degree: (Shift + +) or
(Shift + WHEEL up) or
(Shift + Right click on model surface and drag up)
Decrease Transparency: O
Increase Transparency: P
Decrease Specularity: <
Increase Specularity: >
Decrease Opacity of Specularity: ;
Increase Opacity of Specularity: '

Pick tool:
Pick color: V
Pick layer: H

Symmetry:
Change the position symmetry plane:
TAB + moving your mouse

Draw with spline in Paint/ Curves in Voxels:
Add point to a spline: LMB
Draw pressed out curve: Enter
Draw pressed in curve: Ctrl + Enter
Delete all points: ESC
Delete the last point: Backspace

Copy and paste part of surface:
Insert a copied part: Ctrl + V
Copy a part: Ctrl + C
Creation of a new pen from a site: Ctrl + Shift + C

Sync with photoshop:
Edit all layers in Ext.Editor: Ctrl + P
Edit projections in Ext.Editor: Ctrl + Alt + P

Layers operation:
Create new layer: Ctrl + Shift + N
Duplicate layer: Ctrl + Shift + D
Merge down: Ctrl + E
Merge visible layers: Ctrl + Shift + E
Fill unfrozen: Insert
Erase unfrozen: Delete
Fill by mask: Ctrl + Insert

Freeze operation:
Toggle freeze view: Alt + F
Freeze transparent pixels: Ctrl + D
Invert freeze/selection: Ctrl + Shift + I
Show/hide freeze: Ctrl + F
Expand frozen area: Ctrl + NUM+
Contract frozen area: Ctrl + NUM-
Freeze border: Ctrl + NUM/
Smooth freezing: Ctrl + NUM*

Hide operation:
Unhide all: Ctrl + X
Expand hidden area: NUM+
Contract hidden area: NUM-

Retopo operation:
In "Add/split" mode:
Add new polygon: LMB
Split faces/edges, Connect vertex: LMB
Escape from current snapped point: ESC
Tweak edges/vertex: RMB

In "Select" mode:
Select single element: LMB
Add select: Shift + LMB
Subtract select: Ctrl + LMB
Select edge loops: L
Select edge rings: R
Slide selected edges: RMB
Tweak selected vertex: RMB
Subdivide selected faces: Insert
Split selected edges: Insert
Collapse selected edges: Backspace
Delete selected element: Delete

In "Point&faces" mode:
Add points: LMB
Tweak points/Generate faces: RMB
Force generate triangle face: Shift + RMB

In "Strokes" mode:
Draw freehand strokes: LMB
Draw spline: Ctrl + LMB
Connect/ break existing strokes: Ctrl + LMB
Generate faces based on strokes: Enter
Clear strokes: ESC

In "Brush" mode:
Smooth vertex spacing: Shift + LMB

PC keyboard

(updated to 3.1.00)
3D-Coat 3.1 default hotkeys

Legend:
LMB = "left mouse button"
RMB = "right mouse button"
MMB = "middle mouse button"
WHEEL = "mouse wheel scrolling"

Standard:
Open (.3b extension): Command + O
Import for Microvertex painting : Command + Shift + O
Import image plane: Command + Shift + M
Save: Command + S
Save as: Command + Alt + S
Save incrementally: Command + Shift + S
Undo: Command + Z
Redo: Command + Y
Copy: Command + C
Paste: Command + V
Apply operation: Return
Escape from operation: ESC
Swap background and foreground color: X

Viewport:
Rotate: (Option + LMB) or (LMB on empty space)
Zoom: (Option + RMB) or (RMB on empty space)
Pan: (Option + MMB) or (Option + LMB + RMB)
Fit items to viewport: Shift + A
Reset camera to default position: Home
Toggle Full screen/ standard: Option + Return
Toggle Orthographic/ Perspective view: NUM5
Turn on/ off 2D Grid: Command + '
Front view: NUM2
Back view: NUM8
Left view: NUM4
Right view: NUM6
Top view: NUM7
Bottom view: NUM1
Add camera shortcut: Command + Up
Delete camera shortcut: Command + Down
Switch to previous camera shortcut: Command + Left
Switch to next camera shortcut: Command + right

Navigate Screen Materials/ Mask:
Move Materials/ Mask: RMB on empty space
Rotate Materials/ Mask:
Command + RMB on empty space
Scale Materials/ Mask:
Shift + RMB on empty space
Change aspect ratio of Materials/ Mask:
Command + Shift + RMB on empty space

Model display in paint mode:
View relief only: 1
View non shaded: 2
View specular only: 3
View wireframe: 4
View shaded: 5
View low poly: 6
View low shaded: 7

Model display in voxel mode:
View wireframe in voxel mode: W (hold on)

Quick menu:
Hot box: Space
Draw mode panel: E
Symmetry menu: S
Color picker panel: B
Color channel panel: C
Depth channel panel: D
Specular channel panel: R
Quick panel: ~
Brush panel: T
Material panel: M
Layer panel: L

Brush control:
Hide/show brush circle: Capslock
Turn on/off Soft stroke: Option + S
Clockwise rotate brush: 9
Anti-Clockwise rotate brush: 0
Pressing out: LMB
Pressing In: Command + LMB
Smoothing: Shift + LMB
Decrease brush size: ([) or (WHEEL down) or
(Right click on model surface and drag left)
Increase brush size: (]) or (WHEEL up) or
(Right click on model surface and drag right)
Decrease brush depth: (-) or (Command + WHEEL down)
or (Right click on model surface and drag down)
Increase brush depth: (+) or (Command + WHEEL up)
or (Right click on model surface and drag up)
Decrease brush smooth degree: (Shift + -) or
(Shift + WHEEL down) or
(Shift + Right click on model surface and drag down)
Increase brush smooth degree: (Shift + +) or
(Shift + WHEEL up) or
(Shift + Right click on model surface and drag up)
Decrease Transparency: O
Increase Transparency: P
Decrease Specularity: <
Increase Specularity: >
Decrease Opacity of Specularity: ;
Increase Opacity of Specularity: '

Pick tool:
Pick color: V
Pick layer: H

Symmetry:
Change the position symmetry plane:
TAB + moving your mouse

Draw with spline in Paint/ Curves in Voxels:
Add point to a spline: LMB
Draw pressed out curve: Return
Draw pressed in curve: Command + Return
Delete all points: ESC
Delete the last point: Backspace

Copy and paste part of surface:
Insert a copied part: Command + V
Copy a part: Command + C
Creation of a new pen from a site:
Command + Shift + C

Sync with photoshop:
Edit all layers in Ext.Editor: Command + P
Edit projections in Ext. Editor:
Command + Option + P

Layers operation:
Create new layer: Command + Shift + N
Duplicate layer: Command + Shift + D
Merge down: Command + E
Merge visible layers: Command + Shift + E
Erase unfrozen: Delete

Freeze operation:
Toggle freeze view: Option + F
Freeze transparent pixels: Command + D
Invert freeze/selection: Command + Shift + I
Show/hide freeze: Command + F
Expand frozen area: Command + NUM+
Contract frozen area: Command + NUM-
Freeze border: Command + NUM/
Smooth freezing: Command + NUM*

Hide operation:
Unhide all: Command + X
Expand hidden area: NUM+
Contract hidden area: NUM-

Retopo operation:
In "Add/split" mode:
Add new polygon: LMB
Split faces/edges, Connect vertex: LMB
Escape from current snapped point: ESC
Tweak edges/vertex: RMB
In "Select" mode:
Select single element: LMB
Add select: Shift + LMB
Subtract select: Command + LMB
Select edge loops: L
Select edge rings: R
Slide selected edges: RMB
Tweak selected vertex: RMB
Collapse selected edges: Backspace
Delete selected element: Delete
In "Point&faces" mode:
Add points: LMB
Tweak points/Generate faces: RMB
Force generate triangle face: Shift + RMB
In "Strokes" mode:
Draw freehand strokes: LMB
Draw spline: Command + LMB
Connect/ break existing strokes:
Command + LMB
Generate faces based on strokes: Return
Clear strokes: ESC
In "Brush" mode:
Smooth vertex spacing: Shift + LMB

Notice:
There is no Insert key on Mac keyboard.
But there are 4 items were mapped with
Insert key. To use those items via hotkey,
please redefine hotkey for them.
In layers operation:
Fill unfrozen: Insert
Fill by mask: Command + Insert
In "Select" mode of Retopo operation:
Subdivide selected faces: Insert
Split selected edges: Insert

Mac keyboard

(updated to 3.1.00)
3D-Coat 3.1 default hotkeys

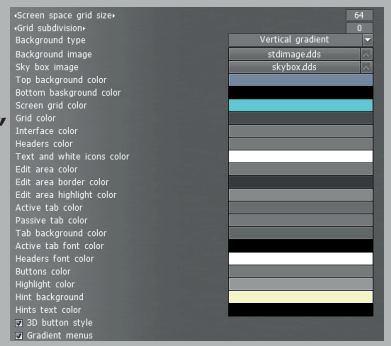
18.0 Customize Hot Keys & User Interface

3D-Coat is fully customizable, and it is quick and easy to do. All UI settings, hot keys and other customized information are stored in a small **XML** file, allowing for easy distribution of all customized presets.

18.1 Customize Hot Keys

To define a hot key is very simple. All you need to do is point your cursor over the item you would like to set a hot key for and press the **END** key -- you will then see this prompt:
You can now press the key(s) you would like to assign to the function. Keep in mind that nearly every button or menu item you see in ***3D-Coat*** already have a custom hot key. If a hot key is already used, it is no problem to re-assign the hot key to whatever new hot key you would like.

18.2 Customize User Interface



The UI layout of ***3D-Coat*** is fully customizable. By default there are three UI themes included in the installation. They are ***"Dark", "Grey"*** and ***"Light"***. You can change this by going to ***Edit–>Preferences–>Load***, and you will then be directed to a folder named ***"OptionsPresets."*** There are 3 **.XML** files in it, and each of them is corresponds to an interface theme. To load the themes, simply select one **.XML** file and click ***Open***. You can of course edit many more parts of the UI and create your own UI theme and save it as an **.XML** file. Just go to ***Edit->Preferences***. Here you can customize the color of text, interface background, header, buttons, grid, background, and so on. You can also turn on/off 3D button style, Gradient menus.

After all these done, just save the **.XML** file, and all the new customized information are stored. You can load it anytime on your own systems or share it with your friends and colleagues. Simply press the button ***Save*** in the ***Preferences*** panel.

You can even change the icons of the tools to your own, just go to the installation folder of ***3D-Coat***. In the subfolder path ***textures\icons*** you will find the source **.PSD** files of the icons, they are *Baseicons.*.**PSD** and *SmallIcons.*.**PSD**, open the **.PSD** file in Photoshop and create your own icons. When finished, save them in the **.DDS** format, keep the name and replace the original *Baseicon.DDS* and *SmallIcons.DDS*. The next time you start ***3D-Coat*** it will load all the new custom icons.

19.0 CUDA

19.1 CUDA Basics

3D-Coat uses CUDA acceleration for voxel sculpting only. Voxel sculpting requires more computing resources because it handles pictures in volume. So we decided to use CUDA to speed up volume operations. CUDA is supported by all the recent NVidia cards, starting with the 8-series.

However the acceleration is hugely dependent on the number of processors available on the card. The real advantage of CUDA over a 4-core CPU can be achieved *only* if the GPU has more then 64 processors, otherwise the 4-Core CPU alone will yield a better speed. So there is no reason to use CUDA acceleration with some video cards, even though they support the technology -- like the GeForce 8400/9400, 8500/9500, G100, G120, G130 and QuadroFX 1700 -- because they have less than 64 processors.

We can recommend any card from GeForce 9800GT (it's very inexpensive) and higher. Acceleration speed is dependent not only the number of cores number but also on memory bandwidth.
CUDA gives the best speed advantage if you are applying masks and materials over voxel sculpture with big brushes. The speed advantage depends considerably on the tool used.

19.2 The Benchmark

Here is the benchmarking info for a standard PC with a 4-core CPU (Q6600, 2.4 GHz, GPU 9800GT). We ran 6 tests, using several types of drawing with a mask either enabled or disabled.

Draw with sphere: CUDA+thin pen(10) Avg. **FPS:31.3**
Draw with sphere: CPU+thin pen(10) Avg. **FPS:30.5**
Carve: CUDA+thin pen(10) Avg. **FPS:34.1**

Carve: CPU+thin pen(10) Avg. **FPS:30.5**
Carve with mask: CUDA+thin pen(10) Avg. **FPS:31.0**
Carve with mask: CPU+thin pen(10) Avg. **FPS:26.4**
Draw with sphere: CUDA+thick pen(40) Avg. **FPS:13.6**
Draw with sphere: CPU+thick pen(40) Avg. **FPS:10.4**
Carve: CUDA+thick pen(40) Avg. **FPS:18.3**
Carve: CPU+thick pen(40) Avg. **FPS:10.3**
Carve with mask: CUDA+thick pen(40) Avg. **FPS:14.3**
Carve with mask: CPU+thick pen(40) Avg. **FPS:7.2**

The largest advantage of CUDA over CPU-only is visible when a mask is used. The faster FPS numbers means, of course, more speed. 9800GT is a very low-priced card, but using a GTX260 or later or a QuadroFX with a large amount of cores will give the best speed.

It is cheaper to buy a good video card than, for example, a Core i7 processor. We can also recommend buying a video card with 1GB or more of memory, because it will allow you to edit really large textures in ***3D-Coat***.

CUDA's efficiency is limited on very large brushes, so, when reaching a particular radius, CUDA will be automatically disabled in tools like the ***Airbrush, Increase, Build*** and ***Smudge***. On a scale of 1:1 it is a radius of around 65. The surface and object tools are not getting any advantage from CUDA.

19.3 Multi-Threading

A few operations in ***3D-Coat*** are now multi-threaded! At the moment only "merging" functions, such as the voxel Merge, Move and Pose tools, as well as converting your voxel sculpt to surfaces in the voxel room to use the surface sculpting tools. What is more, using the cache function in the voxel room is also multi-threaded. These functions are now quite fast, where as previously they were painfully slow in previous versions of ***3D-Coat***. At the moment multi-threading is limited to a handful of functions, however, in the near future many more functions will be added to the list of multi-threaded tools, where applicable.

20.0 FAQ & Additional Tips

20.1 For Your Information!

Sometimes my painting operations become very slow. How can I best avoid it?

Painting over large single faces will be much slower then over dividedfaces. So try to avoid too big faces in UV-space. Divide large faces whenever possible.

I am getting the error message "The application failed to start because d3dx9_38.dll was not found". What should I do?

Go to the Download page of the official 3D-Coat website, then download DirectX 9c and install it. Even if you have DirectX 10 installed you need to update DirectX 9. DirectX 9 and 10 are independent, so this procedure is quite safe.

I want to upgrade my video card to speed up 3D Coat. What should I choose?

Using modern nVidia cards is best, due to CUDA. You can choose from NV 8800GT (lowest price) to GTX 285 and higher. There is no reason to use multiple GPU cards (SLI) for 3D-Coat. The most important factor for CUDA performance is the number of cores -- it should be 120 or more. Video RAM is important also, because it determines the maximum texture size that can be edited in 3D-Coat. Every pixel takes 8 bytes, so you can easily calculate the maximum size of the texture that can fit into the GPU's memory. We recommend you buy cards with at least 1 Gb of RAM, even more is even better.

Do I need to uninstall 3D Coat every time I install your new software upgrades?

No, you can install the update simply by overwriting the existing installation (at least until we release a major, non-free version upgrade).

I am unable to register – every time I enter serial number and press Register, 3D Coat restarts and asks for the serial number again. How can I exit this loop?

Check if you might have copied to the clipboard extra characters -- or missed some characters. Check that the serial number is for ***3D-Coat*** Version 3 -- often users are entering serial numbers for Version 2. Version 3 serial number begins with 3DC3SN-. If you are under Vista x64, please ensure that you are running ***3D-Coat*** as an administrator. If the problem still persists try to delete the file *License.dat* from the ***3D-Coat*** installation folder manually.

There are too many texts hints in the interface, is there a way to hide them?

If you are new to ***3D-Coat***, it isn't recommended that you hide the hints, because these will really be helpful for your study. But you can hide the hints anytime you want, just go to the menu ***Edit->Preferences->Show hints*** and uncheck that checkbox. You can turn on or off the big bottom hints separately by using ***"Show big hints on the bottom panel"***.

I am using Vista/XP 64-bit and 3D Coat does not respect my Wacom pen pressure. What should I do?

3D-Coat works well with 64-bit drivers. Get the latest Wacom driver here: **www.wacom.com/downloads/drivers.php**

Can I move/rotate/scale the objects but not the camera?

Yes, you can. In the "Sculpt mode" of tools panel, select the "Select/Move" command -- then you can select the object you want to move/rotate/scale.

How can I adjust the pivot point?

In 3D-Coat, the pivot point is dynamic and based on the currently picked point (where you cursor last pointed on the model). But you can set the pivot point manually using the "F" key. Also, please see the Camera menu -- it lets you pick the best pivot mode.

What's the difference between the normal maps standard used in 3ds Max and Maya?

The green channel is reversed. You can select the normal maps standard in the menu ***View->Options***.

When should I use the DX version and when the GL version?

It depends on your hardware. 3D-Coat has two Graphics Modes: DX (DirectX) and GL (OpenGL). the GL mode usually runs much faster than DX mode on professional Quadro graphics card, while the DX mode will run faster on consumer-level game graphics card.

What's the difference between "Depth" and "Sculpt mode"?

In ***3D-Coat*** there are two types of sculpting modes: one is image-based and another is mesh-based. ***"Depth"*** is image-based sculpting -- in this mode you are drawing the depth by creating a vector displacement, the normal map and displacement map is generated "on the fly." If you want to get hold of the normal map, just save it -- it's not necessary to wait a long time for baking, because the normal map is generated in real-time.

When you enter ***"Sculpt mode"***, you enter the mesh-based sculpting mode. In this mode you you're really changing the vertex positions of the mesh. If you want to get correct normal map in this mode, you may use ***Textures->Texture Baking Tool.***

What's the use of the Cavity painting?

Cavity painting lets you paint in the *crevices* of the surface without affecting the rest of the area, and vice versa.

I selected the command "View->Environment Shade", but there seems to be no change, why?

You can only use ***"Environment Shade"*** if you have a specularity map in the model. That means if you haven't painted specularity on the model, you will not see any change.

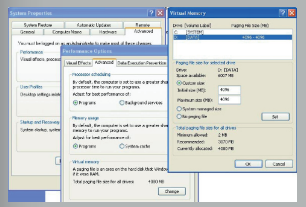
Why is drawing with the SHIFT key so confusing?

Different sequences of the **SHIFT** key and the **LMB** will result in different effects. If you first press and hold **SHIFT** and then draw with **LMB**, the surface will be smoothed. But if you first press and hold **LMB** and then press **SHIFT** and draw, you will get straight lines -- just like in Photoshop.

How can I create a seamless texture using 3D Coat?

It is easy to use 3D-Coat to create seamless textures and bump maps. Just go to menu File->Import->Image Plane, you may want to use Textures->Offset tool as well. You can read more about it on page.

What are the best practices regarding memory management and increasing stability?



When 3D-Coat is run you can see the amount of free memory in the left bottom corner. If this value becomes too low (200- 300 MB), the program can become unstable. These tips will help you to increase stability.

How can I find and safely edit the file "boot.ini"?

Right-click ***My Computer->Properties***. The System Properties dialog box will appear.

Click the ***Advanced*** tab. In the ***Startup and Recovery*** area, click ***Settings***. The ***Startup and Recovery*** dialog box will appear. In the ***System startup*** area, click ***Edit***. This will start Notepad and open *"boot.ini"*. In the [Operating Systems] section, add the following switches to the end of the startup line that includes the ***/fastdetect*** switch: ***/3GB*** Save the changes and close Notepad. Click **"OK"** twice to close the dialog boxes, and then restart the computer for the change to take effect.

You can read more about the /3GB option here:
http://technet.microsoft.com/en-us/library/bb124810. aspx
http://www.vfxpedia.com/index.php?title=FAQ/3GB_Switch

20.2 Video Tutorials

There are many video tutorials out there for ***3D-Coat***. If you're looking an answer to a specific question, or just want to get some idea of what ***3D-Coat*** is capable of, check out the video training at some of the links below:
http://www.3d-coat.com/tutorial/
http://vimeo.com/channels/3dcoat
http://vimeo.com/channels/3dctraining
http://vimeo.com/user2003041/videos
http://www.vimeo.com/gregwhedon/videos

21.0 Contacts & Credits

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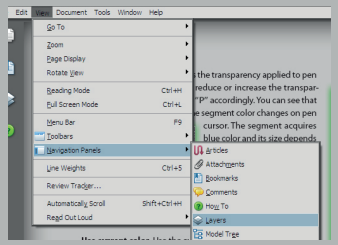
22.0 Printing This Manual

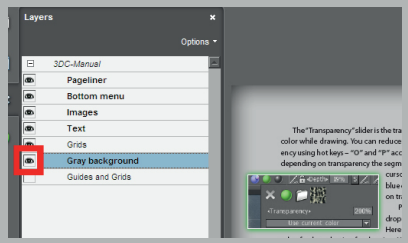
You may of course also print this manual! But you probably don't want to waste unnecessary ink. Please follow these simple instructions to remove the grey background in this PDF document.

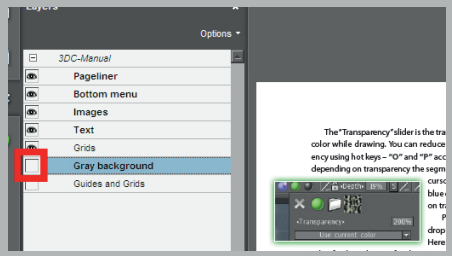
In Adobe Reader, first move your cursor to ***View->Navigation Panels->Layers***. You should then see, on the left side, a new panel called "Layers". You will only see "3DC-Manual" or something similar. Then click next to the **"+"** icon to expand the Layer system. You should see a layer named "***Gray background***", and right next to it a visibility icon, represented by an eyeball. Click the eyeball to toggle the visibility off. All this is clearly shown in the images on this page.

You should now see a white background in this document, and can print it using much less ink.

If you want to save even more ink, you can also hide the layer named "Images" -- and only print the text parts of this manual.







23.0 Applinks

The development of "live" links between 3D-Coat and other commercial 3D applications is an ongoing project. So, consider some of these "Links" as beta versions. As of this printing, the list of available Applinks is as follows:

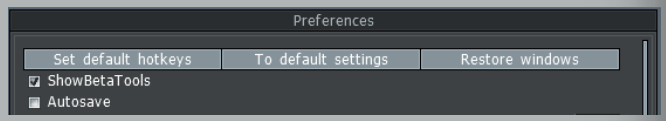
Maya, 3DSMax, Lightwave, Modo, Houdini, SoftImage, C4D, Messiah Studio, Cheetah3D, Unity3D, Blender, Zbrush, Modo

After installing you should run your App, then run 3D-Coat. There should appear the new menu in 3D-Coat - File-> Open in -> Your app name.
You may use this item to bring 3D-Coat's models from any room (Paint, Retopo, Voxels) to your app with color, normal, displacement and specular. But you should choose what you need - displacement or normalmap, not both at once.

Also you may bring your models from your app to 3D-Coat using plugin. In this case you will get new item in menu - File -> Open in original app. In this way you may bring model back to your app.

Find your Applink at : http://3d-coat.com/applinks

24.0 Beta tools



Edit->Preferences->Show beta tools.

Beta tools are mostly intended to be in the next **V4** but if you want you may enable them.

Beta tools are mostly boolean operations and Live Clay related.

These tools are very powerful and developed rapidly.
This is short list of tools that are accessible right now in the 3.7 release:

- Live Clay tools - dynamic tessellation
- Dynamic tessellation for existing tools in voxel surface mode
- Boolean operations. You may use primitives and the Merge tool to add or subtract models in a voxel surface scene.

- boolean operations between volumes - add/subtract/intersect volumes in surface mode without converting to voxels
- remove mesh self intersections, cleaning mesh up, closing holes.

25.0 What's New In Version 3.7

3D-Coat v3.7 Featuring Applink Connection Plug-ins

Change List:

Applink Connection Plug-ins!
New brush engine!

- Support of instancing (See the Instancer tool + the new check box in the Merge tool). It gives the ability to use one volume multiple times in the scene without any additional memory consumption. For example, you may take several bricks and make a building of them, keeping the scene very light, and only initial bricks will use memory. This way you can manage really huge scenes, provided they can be decomposed into a smaller numbers of basic elements. The scene in the viewport will also be rendered faster because of significantly less video memory consumption. It is extremely helpful for architecture, hard surface modeling, and often for organic elements (scales, teeth).
- New CutOff tool allows you to perform very precise boolean operations!

Voxel Mode:

- Speed-up in voxel surface mode.
- New voxel export option - "File->Export projected quads" - alternative high quality quad only voxel export
- Realtime preview for Sketch tool. You will see the summary volume immediately while painting.
- Free form transformations in Pose tool. Example, http://bit.ly/itnFBA , http://bit.ly/jed7ym
- Rapid2/Mud2 brushes are smoother and nicer versions of Rapid/Mud brushes. These new brushes are based on the same principle as the new Clay brush.
- New brush, based on surface clay, that is similar to the Build brush, in the Voxel room and Wax in MB. It is a modification of the Clay brush, and it is a super cool method for building up a shape.
- Optional ability to merge a mesh into a voxel scene without actual voxelization. It will appear in voxel surface mode and will be voxelized when you turn it to voxel mode.
- Ability to save separate voxel layers as 3B files (with sub-tree or without).
- Improved Model/Splines tabs in Voxel room. You will be able to add new profiles, drag volumes/external objects to those windows, Add/delete/rename items/folders. Importing a spline profile is now very user-friendly. It is possible to use Drag&drop or VoxTree RMB menu.
- Arbitrary change of resolution of voxel volume. You may change mesh resolution to any given number of polygons.
- New command "Apply to visible" and "Apply to subtree" in the Shaders RMB menu.
- Extrude - like tools in voxel mode improved - they will work in lines mode (snap to surface) with a more uniform stroke.
- Rapid/scratches/mud brushes tuned to be more "clay-like".
- New brushes: Scratches, Mud, Inflate.
- New tool in voxels - Clone. It acts like Cut&Clone but skips cutting.
- http://t.co/U0acUZY . It may copy just the surface if needed - super cool to create clothes, stamp logos, shells - http://t.co/gjcmrwL . In general, it allows you to paint over a voxel model with different colors/shaders, of course without blending - http://t.co/WcbU470
- Support of painting/carving over planes/surfaces defined by 3 or 4 points
- http://bit.ly/gk6xi0 , http://bit.ly/el1Sql

Paint Mode:

- Essential speedup in per-pixel, microvertex and ptex mode.
- Two new powerful tools in Paint room (Layers menu) - Clamp depth and Copy channels. Both respect freeze. Copy channel allows you to copy any channel (R,G,B, Luminosity, Alpha, Specular, Depth) to any other channel of any layer. Copying masked by freeze.
- New option Import->Import geometry in the Paint room. In this way you will be able to change geometry/topology in your external editor, preserving layers. Imported geometry may have changed topology but UV configuration should be preserved at least approximately. Works only for per-pixel painting.

- Projection painting in Photoshop improved a bit - now you may edit projection even if inside an object, (e.g. Skybox).
- All blending modes in the Paint room are synchronized precisely with Photoshop.
- Baking improved.
- New important command in Ptex mode “Fit in one texture” introduced.
- Support of alpha images mip-mapping. It leads to really good stroke quality.
- Compare: http://bit.ly/ea0WCL and http://bit.ly/eS5cqK . It is especially important if a contrasty high resolution alpha is used. Old style stroke was too noisy, new style is very smooth like it is in PS. More images to compare: http://bit.ly/guuQjL and http://bit.ly/eWxOZz
- Much more accurate fading of edges while updating projection created in Photoshop, etc: http://bit.ly/fqs2I6
- Ability to paint over materials and masks directly in 3D-Coat - http://bit.ly/oY8ojw
- Updated OBJ files support. Now you will be able to import color, specular, normal, displacement maps during OBJ import. Here is the document that describes the changes - http://bit.ly/gUUi45
- Possibility to paint through an object - start stroke beside the object or end stroke beside the object.
- "Copy channels" command is added to Layers RMB menu.
- New option in brush settings - "Vary color along stroke" to be able to draw fur-like textures.
- Ability to choose the style of brushing in Paint mode and Voxel surface mode – new function to produce a smooth stroke shape with self intersection, as found in PS - or you can opt for old-style (but improved) strokes with strict adherence to an alpha shape (but with strict self intersection).
- Hue, Saturation, Lightness jitters are implemented in the Brush options panel.
- Depth painting quality in ppp improved a lot, now it is very smooth and accurate.
- Much better projection connection with your external image editor. It will fade edges accurately - imported image will be more accurate. It will be possible to apply projection through an object if desired.
- Every tool stores its own brush/alpha. It can be turned off in preferences.
- Loading for ppp, change map resolution, Apply UV, Fill tool are now multicore optimized to work much faster.

Retopo & UV Mode:

- Autopo improved.
- Auto UV-mapping improved.
- Clone function in Retopo->Select [faces] to clone parts of a mesh.
- Ability to transform the whole retopo mesh or its selected parts with new Transform tool in the Retopo room.
- Transform gizmo in Retopo tool now has "To local space" button to orient the widget according to the main axis of selected elements. It orients the widget intelligently according to the selected elements.
- Ability to see the number of UV vertices in the Retopo room. It is important if you have a budget of polygons for a game model.
- Support of copy-paste in the UV tool - http://bit.ly/e1hFqU . It is useful to perform UV mapping over repeatable or symmetric details.
- Support of multiple UV-sets in the Retopo room.
- Only visible faces will be baked in the Retopo tool during baking operations.

Other changes:

- New user-friendly way to share 3D-Coat's resources - http://bit.ly/iEndgn . You may easily create extension packs (3dcpack) with your own Brushes / Strips / Materials / Masks / Shaders / Navigation etc.
- If SHIFT and LMB are pressed simultaneously - and even if SHIFT is released, but LMB pressed - 3DC will act as if SHIFT is still pressed.
- Drag and dropped image may be assigned to be a background.
- 3D-Coat now creates a jpeg with preview in same folder where a 3B file is saved. Clicking on them will open the 3B file.
- Symmetry panel has a new "Lock symmetry plane" checkbox to lock the symmetry plane and avoid unnecessary movement by accidentally hitting the TAB key. Also ALT-TAB will not conflict with TAB pressing to move the symmetry plane.
- Ability to load grayscale pictures as contours in the E-panel (through "Load shape" button).
- EPS file format supported for importing shapes for the E panel.
- Hiding/showing all but this layer using ALT will work for everything that has an eye icon - retopo, objects, materials, voxels, paint layer.
- ZBrush-like navigation preset for ZBrush fans.
- SHIFT-axis-snapping when navigating.
- 3D-Coat will detect tablet pressure levels automatically.
- Overall speed-up everywhere.
- Lots of bug fixes and tweaks.