

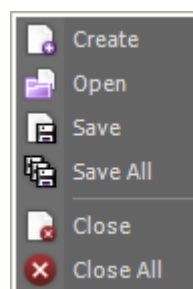
It's a Material World

In this Chapter I'm going to be showing you how to create and use Materials. In ShiVa's Material Editor, you can both create and edit Materials. Included in the Material Editor are the abilities to add Textures, Lighting, and a Fresnel effect, as you will see shortly.

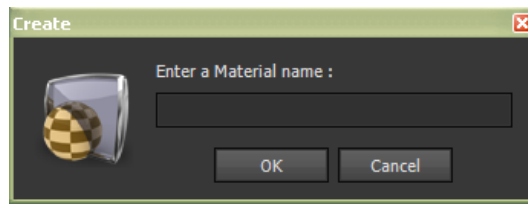
The Material Editor is used to create and edit Materials, which are similar to Shaders. In ShiVa you don't have to script your Materials, as the Material Editor is WYSIWYG. Basically, the Material Editor allows you to define lighting methods, configure ambient, diffuse & specular colours, activate shadows, input normal & diffuse maps etc.



To create a Material, simply click on the “Material” menu option and the following menu will appear:



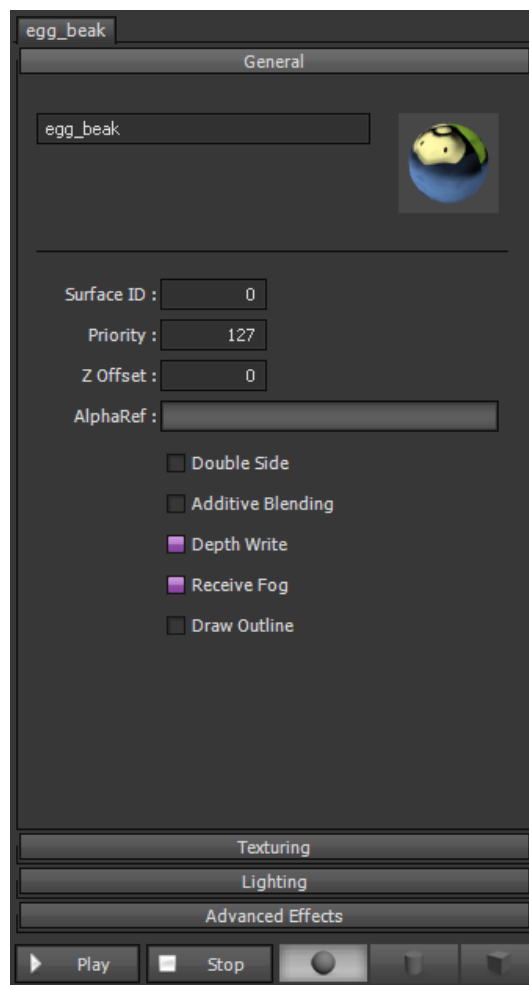
By clicking on “Create”, the following dialog will appear asking for the name of the new Material:



NOTE: The “Edit” menu only has one option, ‘*Batch Processing*’. This option opens the Batch Processing dialog, which will be explained in detail later on in this chapter.

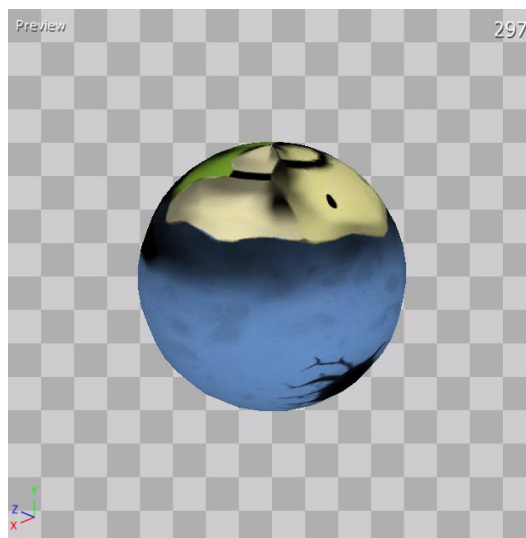
OK, so you have created a new Material, now it’s time to look at the various options in the roll-ups:

General

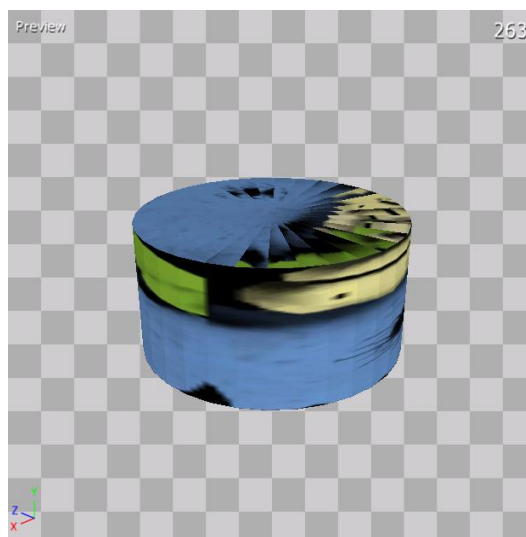


Material Name: This option displays the name of the Material currently selected for editing.

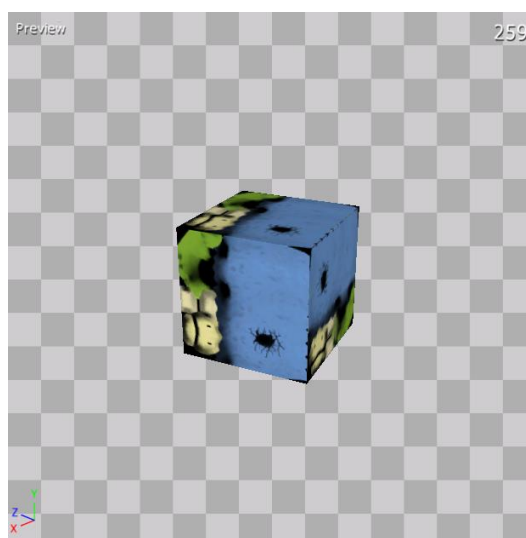
Material display: This box, to the right of the Material name, displays the current Material as if it was applied to a sphere. To view different options, there are three choices available (“Sphere”, “Cylinder” and “Cube”) and these can be selected from the options at the bottom of the Material Editor. Note that these options are only used in the preview mode (available using the “Play” and “Stop” buttons) in the Scene Editor:



Sphere



Cylinder

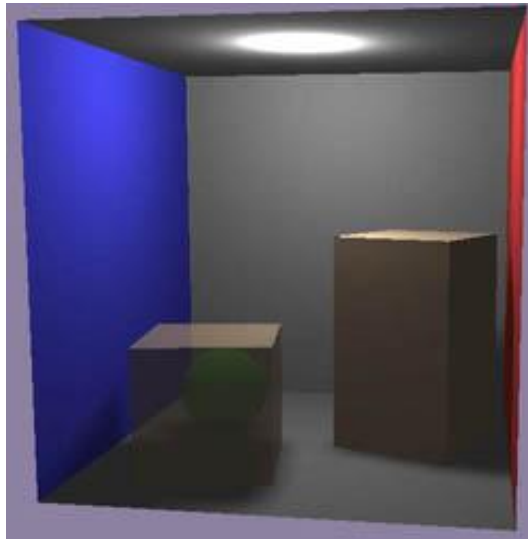


Cube

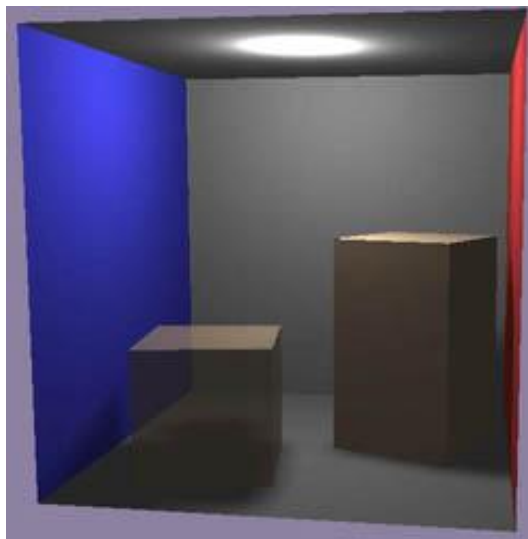
Surface ID: This option allows the setting of the number for the surface that can then be used / accessed via StoneScript [0 to 255].

Priority: This option allows the setting of the render priority of the Object, with transparency according to the z order [0 to 255].

example: *the cube and the sphere both have transparency set to 50%:*



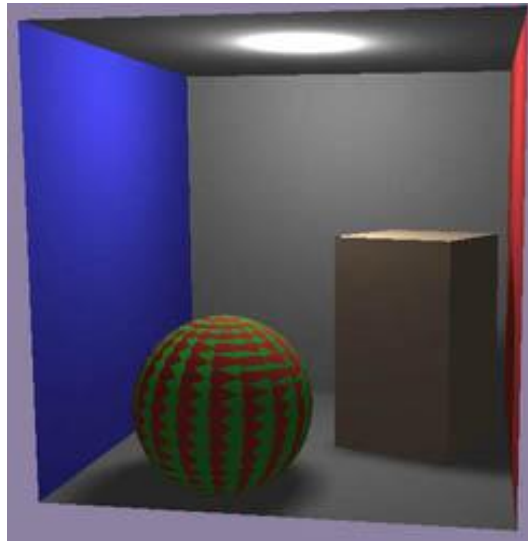
Cube priority: 127 | Sphere priority: 127



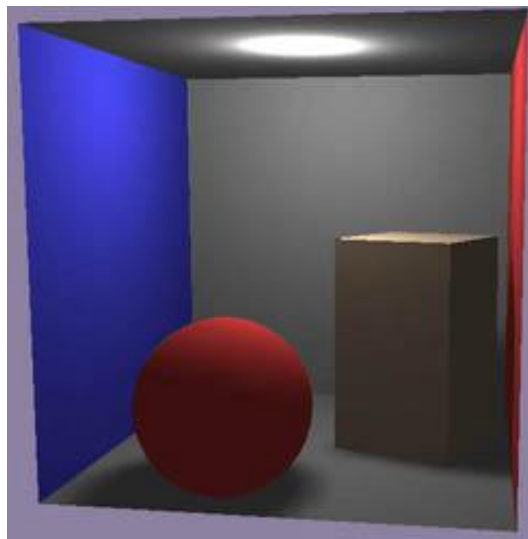
Cube priority: 128 | Sphere priority: 127

Z- offset: This option allows the setting of the offset of the Object according to the Camera [0 to 10].

***example.** identical red and green spheres, with an offset applied to the red ball:*



Without offset



With offset

Alpha ref: This option allows the setting of the value used as a reference for the alpha test. A small value will create transparent edges, and a large value will create smoother edges.

NOTE: a very small value may block the z buffer, whilst a very large value may cause some texture loss around the edges.

example: tree foliage:



Alpha ref at 0%



Alpha ref at 50%

Double Side: This option enables, or disables, the rendering of the inverse face to the normal.

example: a tree:



Without Double Side

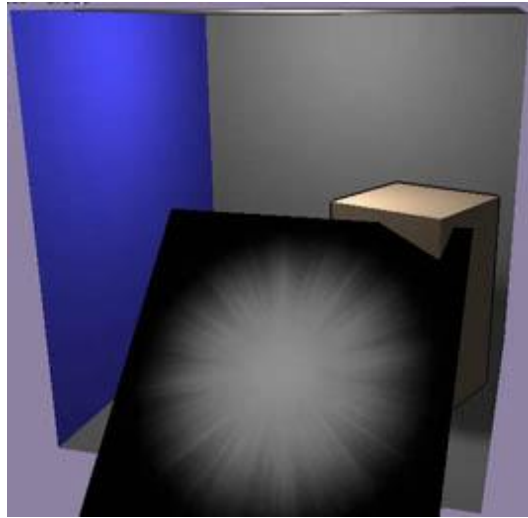


With Double Side

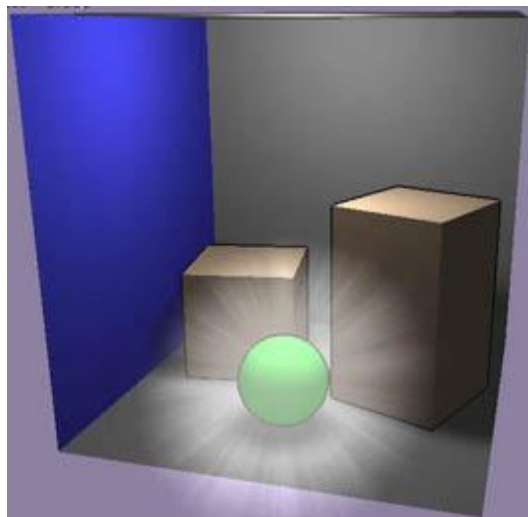
NOTE: activating this option multiplies the number of polygons of the Material by a factor of 2.

Additive Blending: This option enables, or disables, the rendering of an Object translucently without an alpha channel.

example. a glow effect:



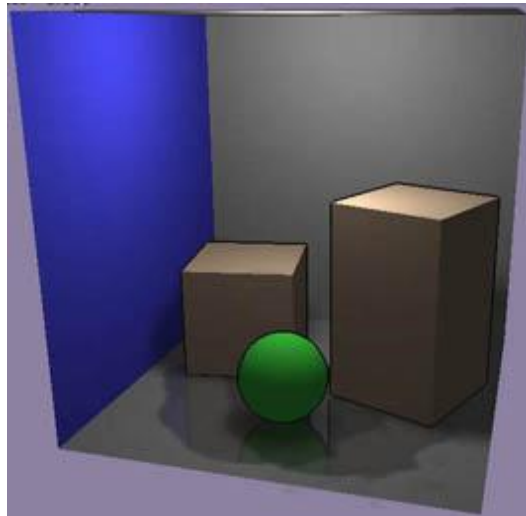
Without Alpha Blending



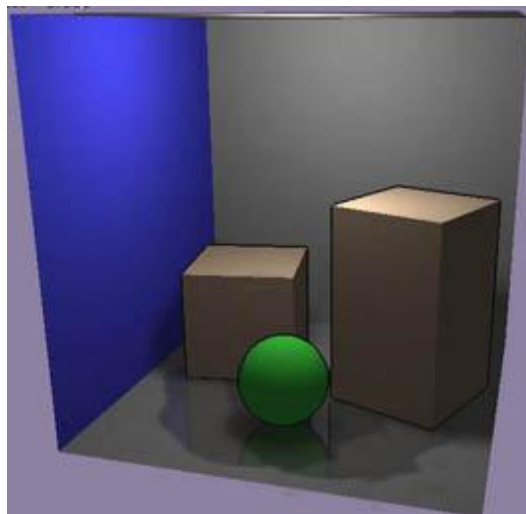
With Alpha Blending

Depth Write: This option enables, or disables, whether the Object to be rendered, must be sorted according to the z order.

example: 2 superimposed planes with an alpha channel texture:



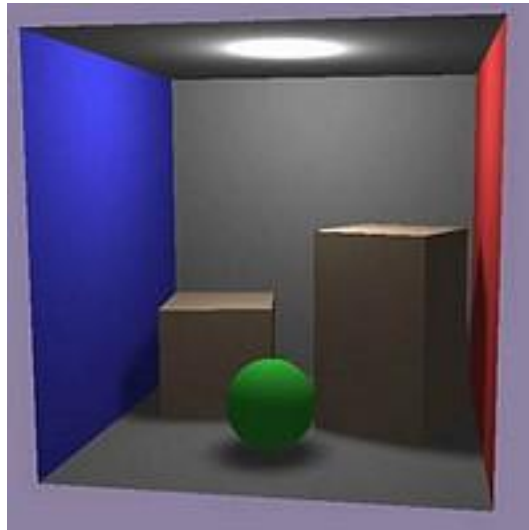
With Depth Write



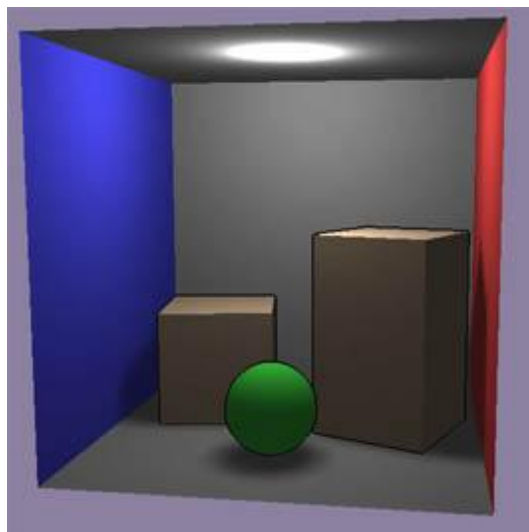
Without Depth Write

Draw Outline: This option enables, or disables, whether the outline of the Object is drawn, or not.

example.



Without Draw Outline

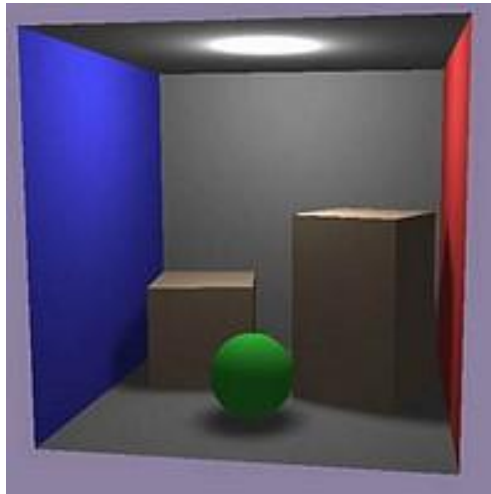


With Draw Outline

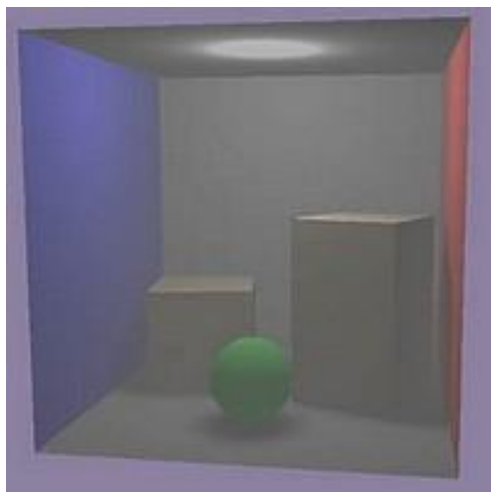
NOTE: The outline colour depends of the selected ambient colour of the Scene.

Receive Fog: This option enables, or disables, whether the Object can receive fog or not, as defined in the Ambience Editor.

example:

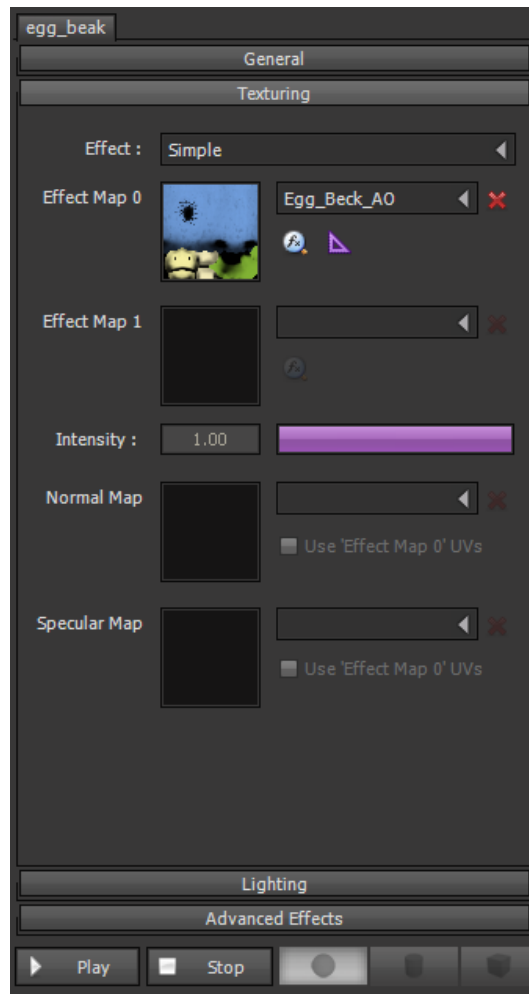


Without Receive Fog



With Receive Fog

Texturing



Effect: This option allows, via a drop-down list, the selection of an effect to be used. This effect can be one of the following:

- None (no texture used).
- Simple (Map0.rgba)
- Modulate (Map0.rgba x Map1.rgb)
- Paint (interpolate by Vtx.a)
- Decal (interpolate by Map1.a)
- Noise (Map1 as dUdV)
- Saturate (Map0.rgba + Map1.rgb)
- Burst

NOTE: the majority of these effects will use the selected effect maps (Map0 & Map1).

Examples:



None: no Texture used



Simple: only Texture Map0 is used (*Map0.rgba*)



Modulate: superimposes the Textures of Map0 and Map1 (*Map0.rgba x Map1.rgb*)



Paint: using the P key, paints the Texture of Map1 on to Map0 (*Interpolate by Vtx.a*)



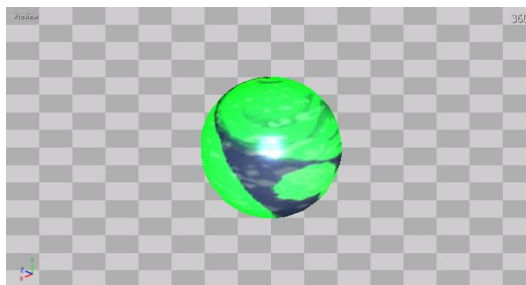
Decal: a sticker effect, render Map1 onto Map0 as a function of the alpha channel (*Interpolate by Map1.a*)



Noise: used with reflection/refraction in map1 (*Map1 as DuDv*)




Saturate: the same as “*modulate*” but using an additive method ($Map0.rgb + Map1.rgb$)




Burst: the same as “*modulate*” but uses a much brighter “glow” effect on Map1.

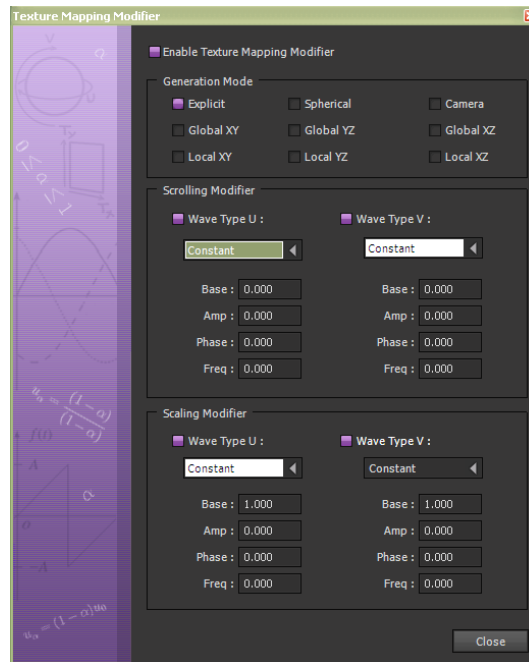
Effect Map 0: This option allows the selection, via a drop-down list of all available Textures, of the base map.

This base map can then be amended by clicking on the following icons:

 - This option deletes the selected texture from the effect.

 - This option opens the following dialog box:

Texture Mapping Modifier



Enable Texture Mapping Modifier. This option will enable, or disable the rest of the options in this dialog.

Generation Mode

These options set the mode of the generation of the Texture, as shown below:



Explicit: this option uses the default uv from the parametric in the modelling software.



Spherical: this option generates the UV using a sphere map.



Camera: this option projects the Texture onto the Object according to the Camera position.



Planar XY: this option generates a planar UV on the XY axis.



Planar YZ: this option generates a planar UV on the YZ axis.



Planar XZ: this option generates a planar UV on the XZ axis.

Scrolling Modifier

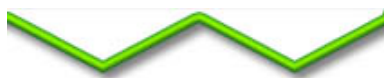
These options apply scrolling to the Texture with the following parameters:

Wave type: The following waveforms can be applied to both the U and the V:

Constant: uses a fixed value.



Sinus: uses a sinusoidal waveform:



Triangle: uses a triangular waveform:



Square: uses a square waveform:



Sawtooth: uses a sawtooth waveform:



Sawtooth Inv: uses an inverted sawtooth waveform:

Sinus Noise: this is similar to Sinus, but with an added random noise.

Base: This option allows the setting of the offset of the Texture [-unlimited to unlimited].

Amp: This option allows the setting of the amplitude of the scrolling movement [-unlimited to unlimited].

Phase: This option allows the setting of the phase (ie: timed offset) of the scrolling movement [-unlimited to unlimited].

Freq: This option allows the setting of the speed of the scrolling movement [0 to unlimited].

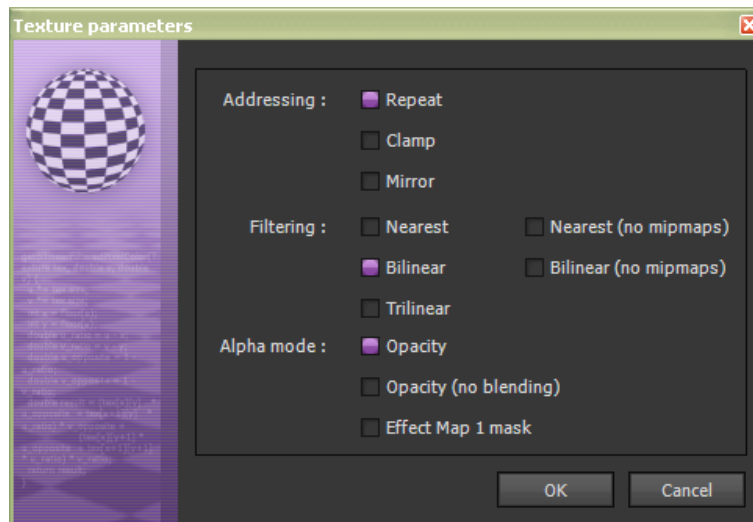
Scaling Modifier

These options modify the repetition of the Texture, in both U and V, and are identical to the options for the *Scrolling Modifiers*.

Texture Parameters



- This option opens the following dialog:

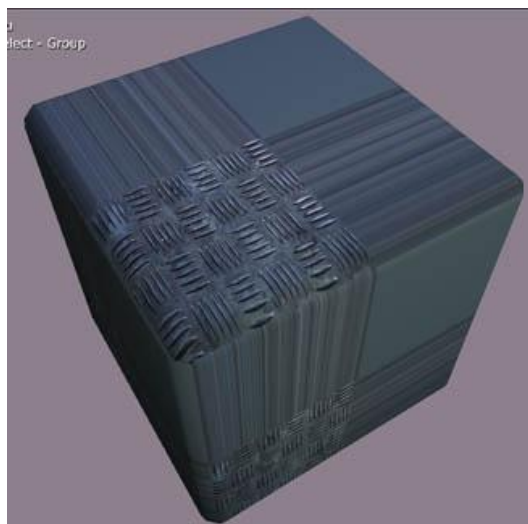


Addressing

These options allow the setting of how the Texture will be applied:



Repeat: this option repeats the Texture.



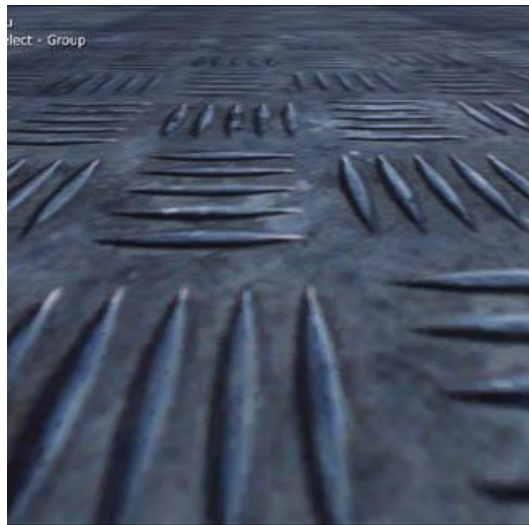
Clamp: this option completes the effect by using the last pixel of the Texture.



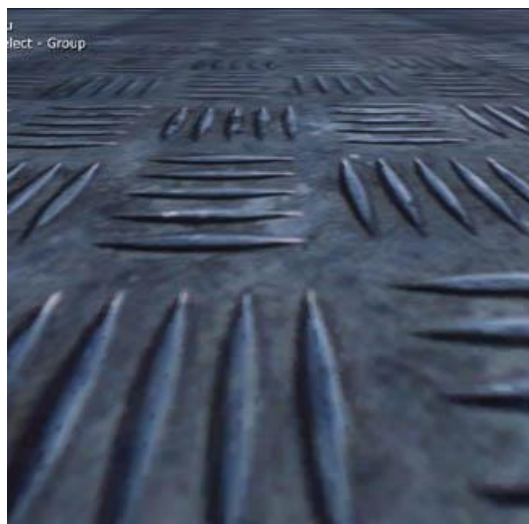
Mirror: this option mirrors the Texture.

Filtering

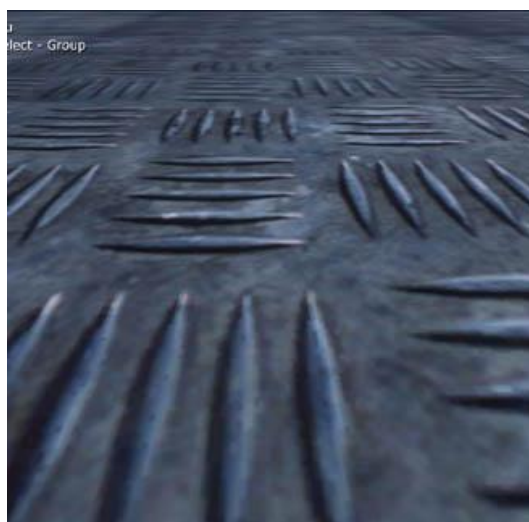
These options allow the setting of which type of filtering will be applied:



Nearest: this option is a simple and fast filter.



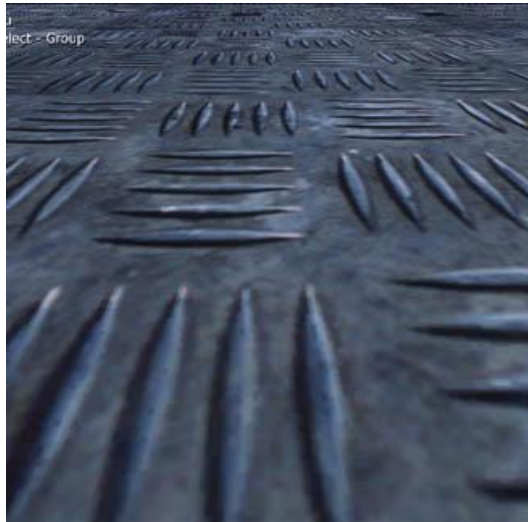
Bilinear: this option produces a smooth Texture when it is rendered different to its actual size.



Tri linear: this option is an extension of bilinear filtering where it interpolates the mipmaps.



Nearest (no mipmaps): this option is identical to *Nearest*, but using no mipmaps.



Bilinear (no mipmaps): this option is identical to *Bilinear*, but using no mipmaps.

NOTE: Mipmaps are pre-computed collections that are optimised for images. They come with the main image, and are used to accelerate the rendering process.

Alpha mode

These options allow the setting of the alpha mode of the render:

Opacity: This option allows the setting of the alpha mode to use Opacity.

Opacity (no blending): This option allows the setting of the alpha mode to use the Opacity, but with no blending applied.

Effect Map 1 mask: This option allows the setting of the alpha mode to use Map1 as the mask.

Effect Map 1: This option allows the selection, via a drop-down list of all available Textures, of the map to be used as Map1.

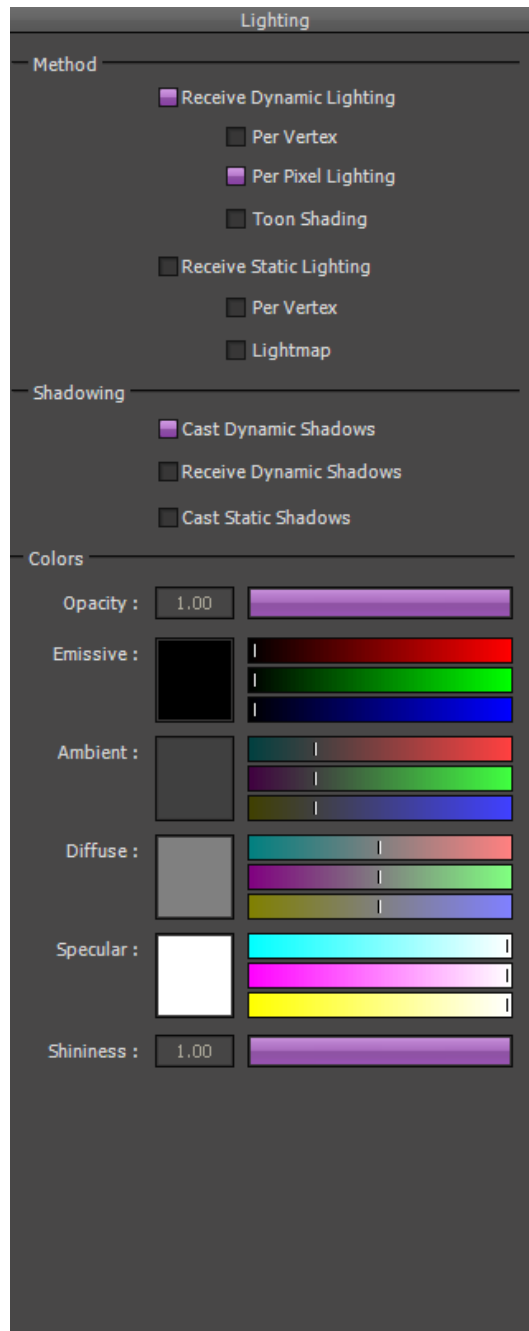
Normal Map: This option allows the selection, via a drop-down list of all available Textures, of the map to be used as the relief map.

Use 'Effect Map 0' UVs: This option allows the use of the uv of Map0, if modified by the "*texture mapping modifier*".

Specular Map: This option allows the selection, via a drop-down list of all available Textures, of the map to be used as the specular map.

Use 'Effect Map 0' UVs: This option allows the use of the uv of Map0, if modified by the "*texture mapping modifier*".

Lighting



Method

Receive Dynamic Lighting: These options allow the setting of the Material to be able to receive Dynamic Lighting:



Per Vertex: this option calculates the lighting for the vertex and then interpolates the colour onto the pixels.



Per Pixel Lighting: this option calculates the lighting for each rendered pixel.



Toon Shading: this option applies a non photo realistic render, and can be associated with draw outline.
NOTE: this can only be used with Per Pixel Lighting.

Receive Static Lighting: These options allow the setting of the Material to be able to receive Static Lighting:

Per Vertex: this option calculates the lighting using the vertex as shown above.

Lightmap: this option calculates the lighting, and then writes the calculated lighting into a special kind of Texture (called a lightmap), which is then used in place of lighting.

Shadowing

These options allow the receiving and/or projection of dynamic shadows.

NOTE: the colour of the shadows is the same as the parameter in the Ambience Editor.

Cast Dynamic Shadows: This option allows the setting of the Material to cast dynamic shadows (ie: shadows computed at runtime).

Receive Dynamic Shadows: This option allows the setting of the Material to be able to receive dynamic shadows.

Cast Static Shadows: This option allows the setting of the Material to cast static shadows (ie: pre-computed shadows).

Colors

These options allow the setting of colours on the Material:

NOTE: the Emissive, Ambient, Diffuse & Specular options allow the use of the standard ShiVa Colour dialog, by clicking on the coloured square next to each one.

Opacity: This option allows the setting of the Opacity of the colour [0 to 1].

NOTE: a setting of 1 means fully opaque and no light will penetrate.

Emissive: The colour box and the sliders allow the setting of the emissive colour of the Material.

Ambient: The colour box and the sliders allow the setting of the ambient colour of the Material.

Diffuse: The colour box and the sliders allow the setting of the diffuse colour of the Material.

Specular: The colour box and the sliders allow the setting of the specular colour of the Material.

Shininess: This option allows the setting of the shininess of the Material [0 to 1].

NOTE: shininess refers to the intensity of the glow of the Material, the larger the value, the brighter the glow.



Specular level to 0.05

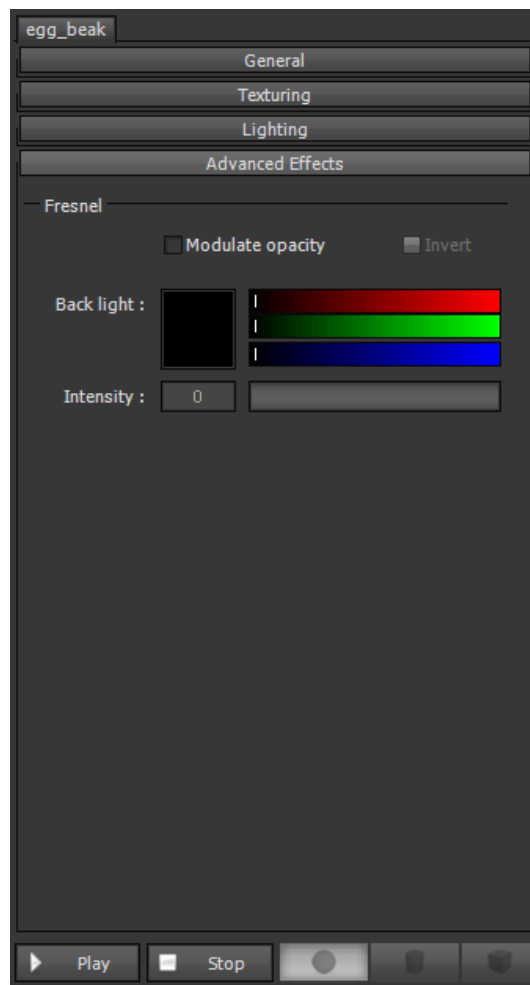


Specular level to 0.5



Specular level to 1

Advanced Effects



As you can see, there is currently only the one advanced effect – Fresnel.

The Fresnel effect is a way of changing the amount of reflectance of a surface dependant on the viewing angle. For example, looking down onto a pool of water you will not see much in the way of reflectance. However, if you look sideways at the pool, you will see much more in the way of reflections and specular effects.

The options for this effect are:

Modulate opacity: This option, when selected, modulates the Opacity of the effect.

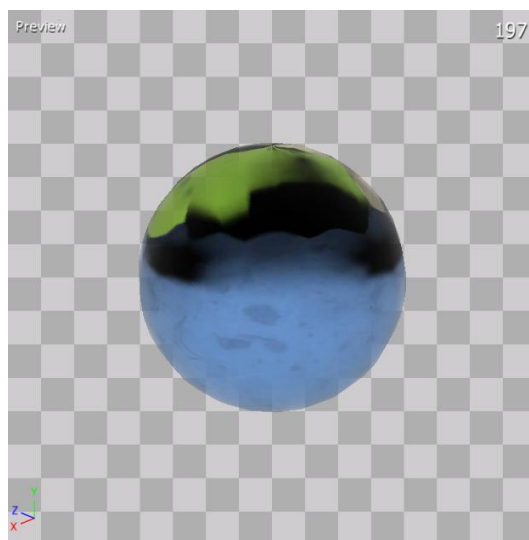
Invert: This option, when selected, inverts the modulated Opacity of the effect.

Back light: This option allows the setting of the colour of the back light of the effect.

Intensity: This option determines the intensity of the effect [0 to 255]



Modulate Opacity



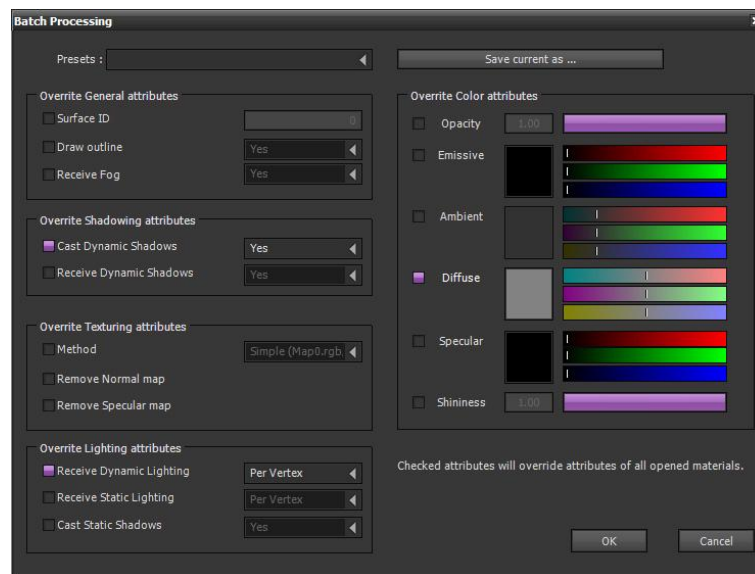
Inverted Modulate Opacity



As above with "Red" backlight & Intensity of 127

Batch processing

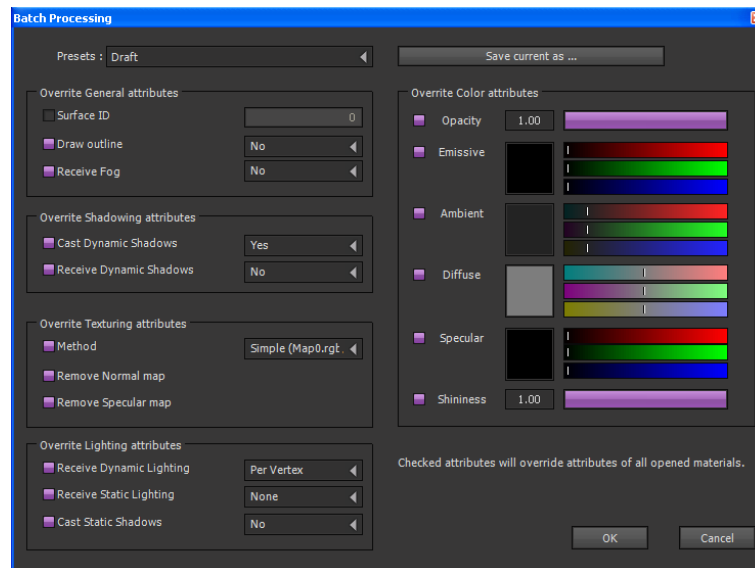
This feature is only available in the Advanced version of ShiVa.



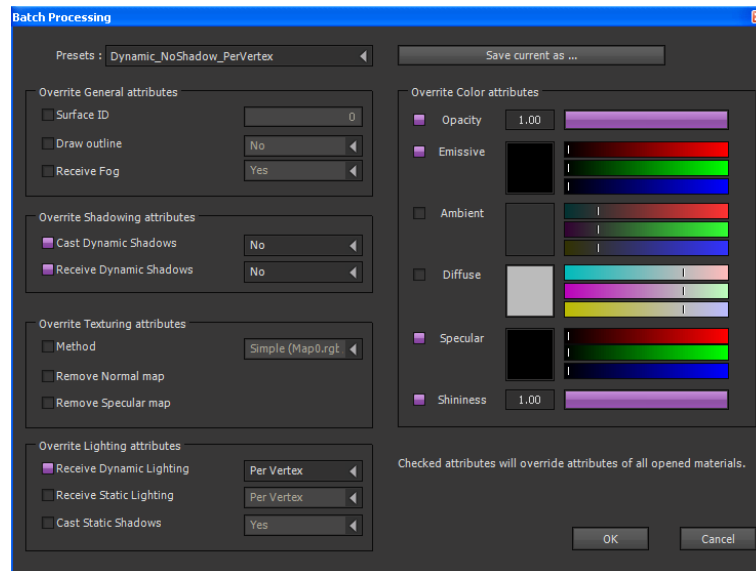
This dialog allows the choice of which Material attributes are to be changed on all of the currently opened Materials.

NOTE: checked attributes will override the corresponding attributes of any opened Material when batch processing is started.

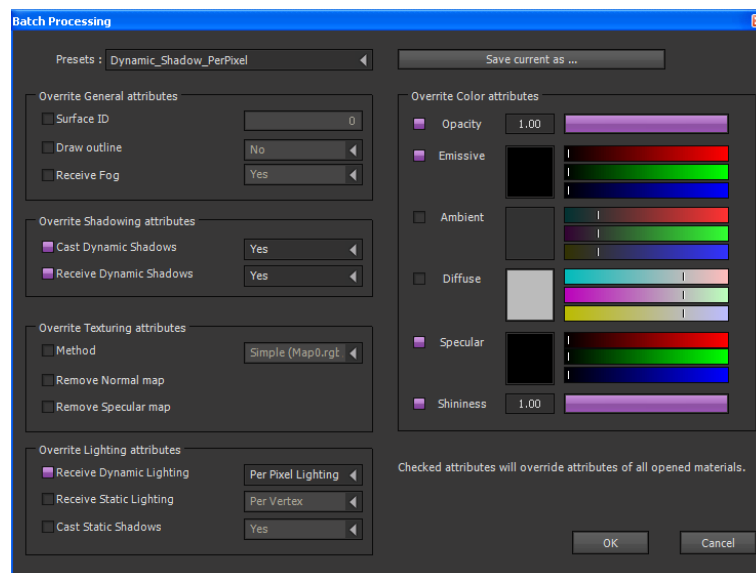
Presets: This option opens a drop-down list containing all of the preset processing options. By default, batch processing has a choice of presets as follows:



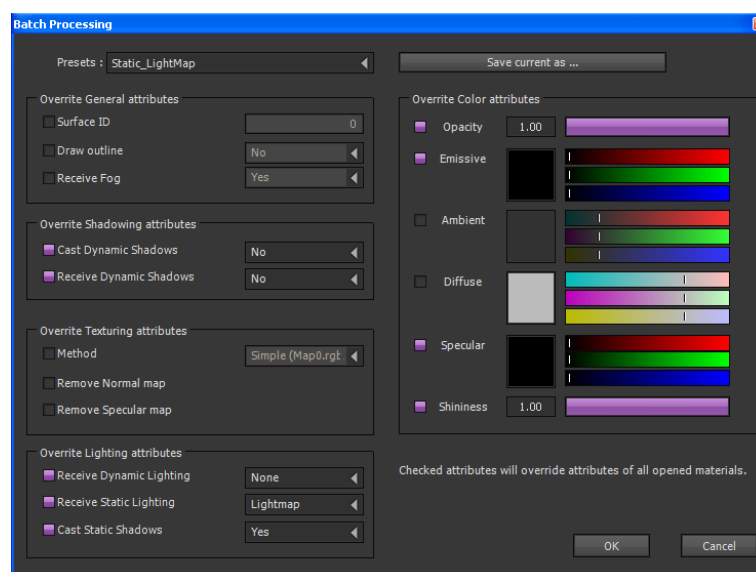
Draft:



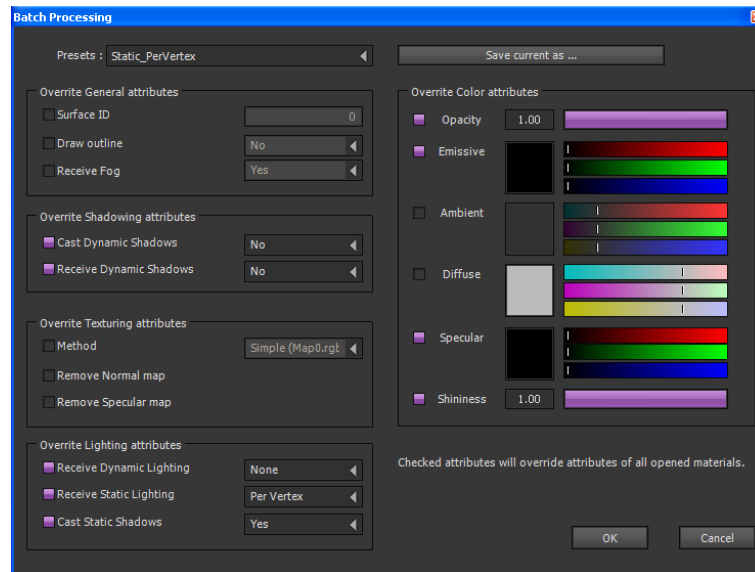
Dynamic_NoShadow_PerVertex:



Dynamic_Shadow_PerPixel:



Static_LightMap:



Static_PerVertex.

Save Current as ...: This button allows the saving of the currently selected options as a new preset.
NOTE: a dialog will appear asking for the name of the new preset.

With that, we come to the end of another Chapter. Next up is an explanation of “HUDs”.