



OctaneRender® for Autodesk® Revit® Plugin Manual

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Installation and Overview

Software and Hardware Requirements

The plugin does not require OctaneRender™ Standalone Edition to be installed. However you must own a license for Standalone Edition in order to use the plugin (your Standalone credentials will be requested when you activate the plugin). If you do install Standalone Edition, it does not need to be the same Octane version as the plugin – since they operate separately.

The plugin requires Autodesk Revit 2014, 2015 or 2016 to be installed on 64bit Windows.

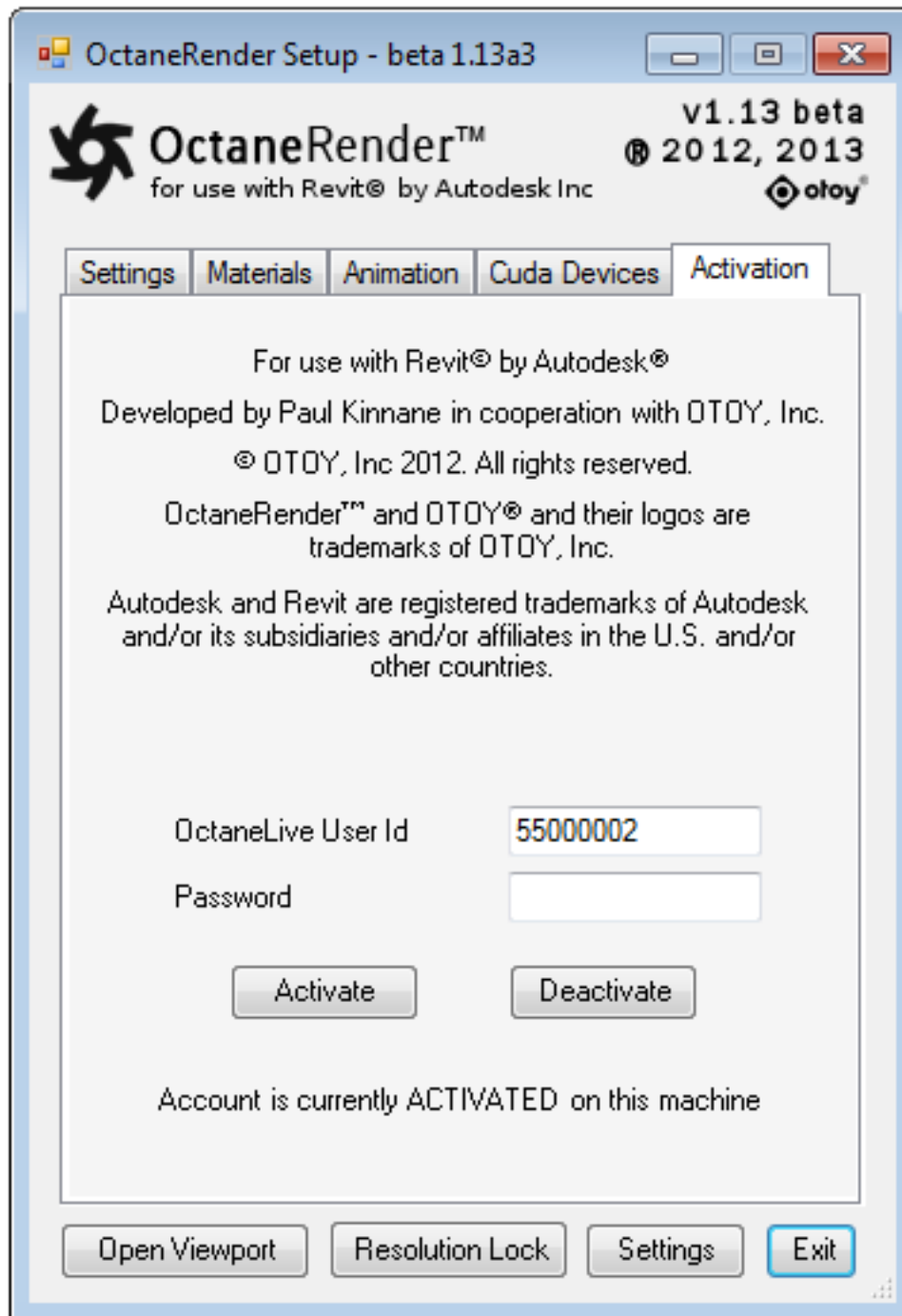
It is also highly recommended that you use your on-board graphics or a second graphics card for the Windows display adapter. If you do not have an on-board or second graphics card, use the Low Priority Render Priority described in "GPU Settings" on page 4.

If you are running a GTX 690, or multiple graphics cards, it is important to **disable** SLI in the Nvidia control panel.

Internet Access

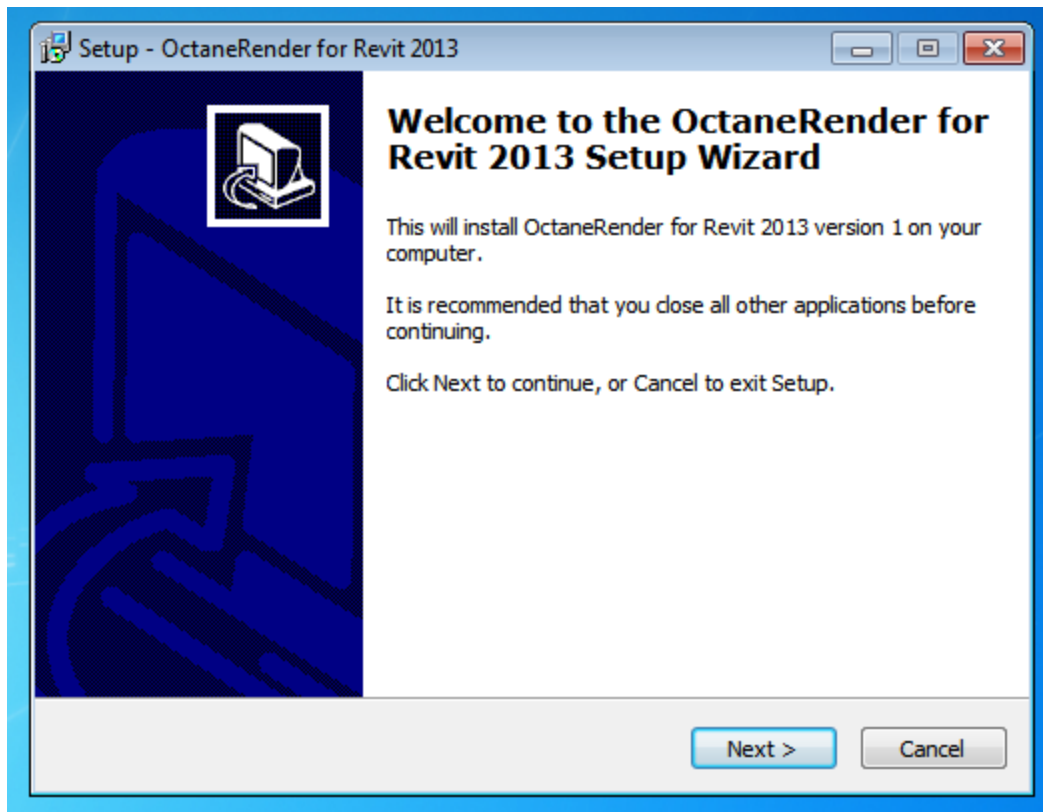
The OctaneRender™ for Revit plugin requires internet access to launch the first time. Internet access is not required to use both OctaneRender™ and OctaneRender™ for Revit plugin.

When no internet access is present, the Live Database will not be accessible. Upon launching the plugin for the first time, the user will need to log in to their OctaneLive™ account which associated with their forum log-in information. This information can be found in the customer section of the OctaneRender™ website.



Installation of the Plugin into Revit

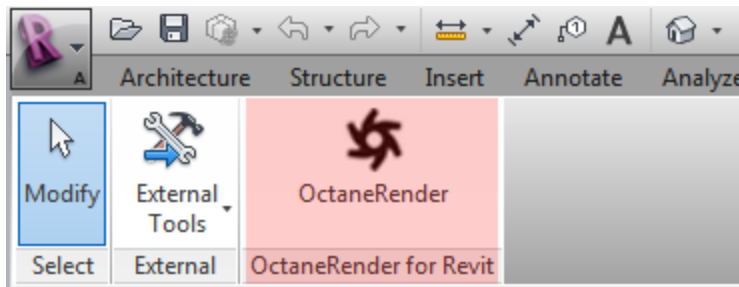
Ensure Revit is not currently running on your PC, and then run the provided installation file (OctaneRender for Revit [year] Setup [version number].exe). Select the install directory of your Revit installation. The installer will copy all the plugin files into the appropriate place.



If you want the plugin to load in Revit when you open .rvt files by doubleclicking them from the desktop (ie. when Revit is not already running), edit the OctaneRender_for_Revit.addin file (in the C:\ProgramData\Autodesk\Revit\Addins\2013 folder). Place your Revit.exe path in front of the dll name in the <Assembly> lines. For example:

```
OctaneRender_for_Revit.addin - Notepad
File Edit Format View Help
<?xml version="1.0" encoding="utf-8"?>
<RevitAddIns>
  <AddIn Type="Application">
    <Name>OctaneRender For Revit</Name>
    <Assembly>C:\Program Files\Autodesk\Revit Architecture 2013\Program\OctaneRender_for_Revit.dll</Assembly>
    <AddInId>cc275222-8afa-4192-bbdf-28cb712a086b</AddInId>
    <FullName>OctaneRenderPlugin.Application</FullName>
    <VendorId>otoy Inc</VendorId>
    <VendorDescription>otoy, www.otoy.com</VendorDescription>
  </AddIn>
  <AddIn Type="Command">
    <Assembly>C:\Program Files\Autodesk\Revit Architecture 2013\Program\OctaneRender_for_Revit.dll</Assembly>
    <AddInId>41d34ec8-525a-4147-bde0-076f05a1b93f</AddInId>
    <FullName>OctaneRenderPlugin.Command</FullName>
    <VendorId>otoy Inc</VendorId>
    <Text>OctaneRender For Revit</Text>
    <Description>OctaneRender for Revit integrated plugin</Description>
  </AddIn>
</RevitAddIns>
```

Once installed, when you next run Revit, the plugin will be available from the Addins Tab.

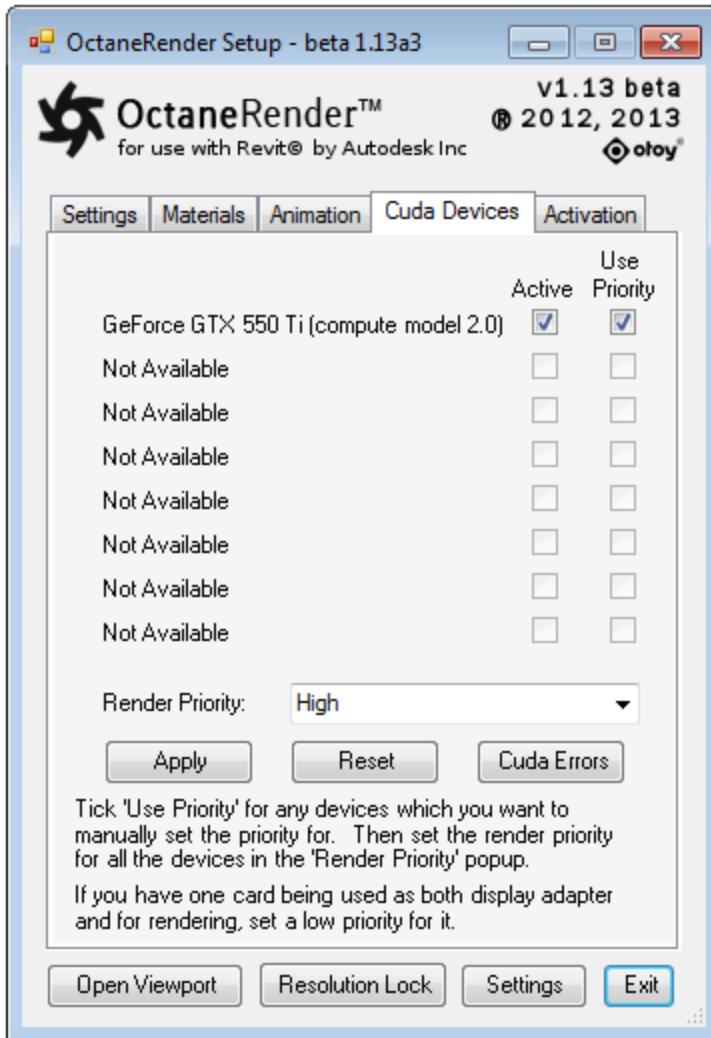


You will need to activate the plugin prior to using it for the first time. Enter your OctaneLive User ID and Password and click the Activate button. Once activated, the other tabs (ie "Settings", "Materials¹", etc.) will be selectable and you can start using the plugin to render.

GPU Settings

The Cuda Devices tab will display the following window:

¹A set of attributes or parameters that describe surface characteristics.



You can enable or disable your Cuda Devices from this window. If for some reason you need to reset the Cuda devices, use the Reset button.

You can also specify particular cards render at the currently selected **Render Priority**. To do this, tick the **Use Priority** checkbox, and then select High, Medium or Low as the Render Priority. If you are using a single card for both Cuda rendering and as you Windows display adapter, it is recommended that you select the **Low Priority**. Remember to click **Apply** to apply a changed Render Priority to your video card.

Important:

- If you have an on-board graphics card (or second graphic card), use it as your Windows display adapter
- If you do NOT have an on-board graphics or 2nd graphics card to use as your Windows display adapter, set the Render Priority of your card to Low (as described above).
- If you get an Nvidia driver crash, this is due to a time-out. In the case, install Octane Standalone (since the installer will change the Nvidia time-out settings), and set the Render Priority of your card to Low (as described above).
- In the unlikely event that you get a Cuda error from your video card, click the **Cuda Errors** button to display specific details on the error.

For troubleshooting problems, refer to the Troubleshooting topic in the OctaneRender™ Standalone Edition User Manual.

Rendering Performance and Quality

A render is not finished when the "kernel"->"maxsamples" are reached. It is finished when the Viewport image quality is free of noise and all details have been rendered to a fine level. For some simple scenes, this will be after 500 samples. For some complex scenes it may take 10,000 samples.

Tips to increase render speed (by increasing sample/sec or reducing the samples required to finish the render):

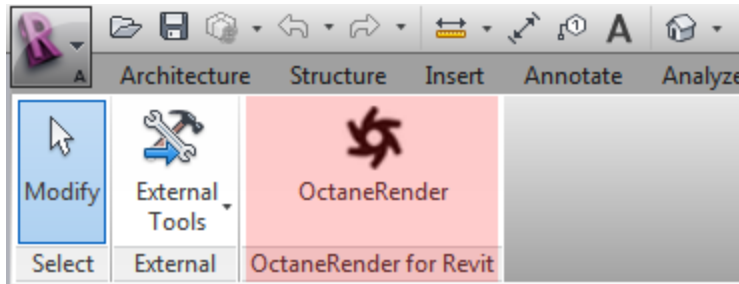
- Use the "directlighting" kernel. This may provide a lower quality output but is much faster than "pathtracing" and "pmc". Only use this option if the reduction in render quality is acceptable.
- Minimise the use of SSS ("diffuse"->"scatter")
- Set "imager"->"hotpixel_removal" to 0. This eliminates most 'fireflies'.
- Increase "kernel"->"caustic_blur" (to whatever level needed – even '1'). This smooths out the noise in the render.
- Use a higher-powered graphics card, or add additional graphics cards to your system.
- Reduce Kernel->GI Clamp (Otoy recommend a GI Clamp of approx 10 to 100 times the Exposure. 1 is a good starting point).
- If you have noise in dark areas this may be due to paths being terminated early, so reduce Kernel->Path Termination Power.
- If the light illuminating the scene has come through a specular (glass) material, using "pmc" rather than "pathtracing". In this situation you can also reduce "kernel"->"direct_light_importance" to give the light that has passed through the glass more priority. Also, you can let more direct light through the glass by reducing the glass material's opacity (from 1 to, say, 0.2).
- If illuminating the scene by emitters, make sure those emitters have as few polygons as possible, and are as large as possible. If using emitters, it is highly recommended that you use an **IES**¹ file in the "distribution" pin to direct the light as required.

¹An IES light is the lighting information representing the real-world lighting values for specific light fixtures. For more information, visit <http://www.ies.org/lighting/>.

Important: Remember to adjust “kernel” -> “rayepsilon” for each scene. The “rayepsilon” will be smallest for close-up renders, and increase as the camera moves further away from the subject.

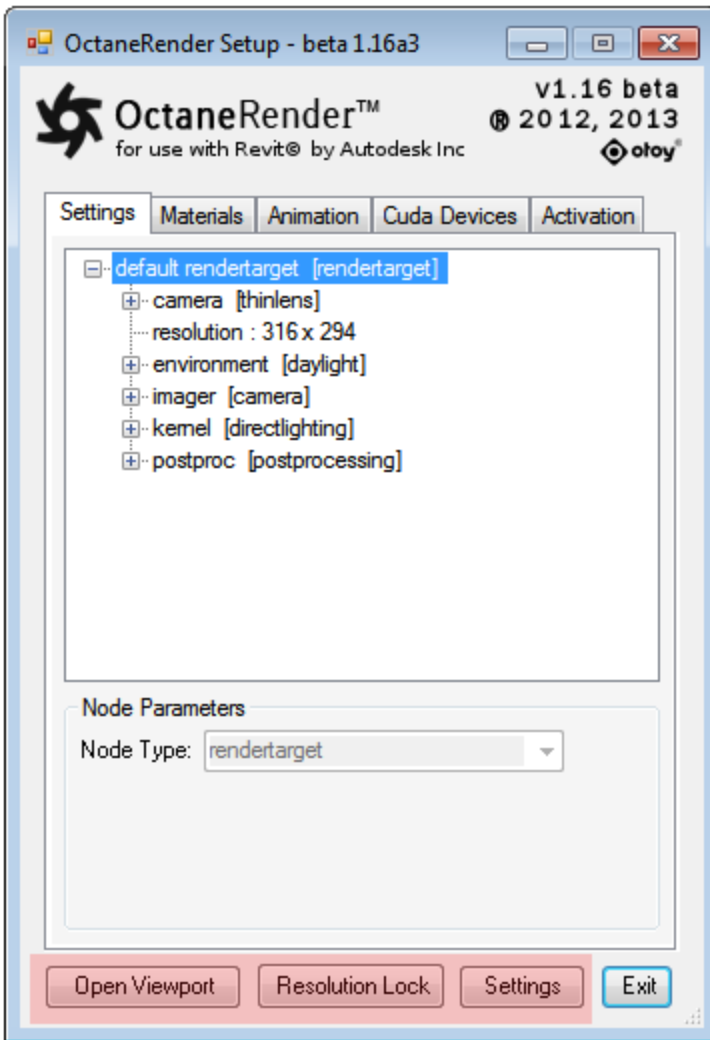
OctaneRender Setup Window

To open the Setup Window, select the OctaneRender icon from the Add-Ins ribbon. You need to be view a 2d view in order for Add-Ins to be clicked.



Once the Setup window has authenticated your credentials, the main plugin setup screen will display, with five tabs:

- **Settings** – The Octane rendertarget settings
- **Materials** – The Octane materials used in the scene
- **Animation** – Sun Studies and Walkthroughs
- **Cuda Devices** – The available rendering devices
- **Activation** – You OctaneLive account credentials



Each Tab contains the following controls:

Open Viewport

Opens the OctaneRender Viewport window and commences rendering (see OctaneRender Viewport).

Resolution Lock

If this button is ON, then the resolution of the render is controlled by the Settings Tab resolution settings. If it is OFF, then the render resizes to the Viewport size and you can resize the Viewport by stretching the window.

Settings

This button opens the configuration settings window (see "Configuration" below).

Configuration

In the Settings tab of the OctaneRender Setup Window is a Configuration button. The OctaneRender for Revit plugin does all the conversion of the Revit scene to Octane for you. However, there are some settings which you can tune to speed up your workflow. Mouseover each of the settings for more details.

In summary:

Viewport Refresh Rate – The number of milliseconds that the Viewport will check to see if Octane has an updated render image available.

Progressive Save Enabled – Tick to have the plugin save the render every "Save Interval" samples. Useful for analysis to determine how many samples are required for a render to be finished.

Image Save Format – the format that the Viewport image will be saved as when you click the Save button on the Rendering tab.

Scene Refresh on View Change – If you change to a different 3D View, the new view may or may not contain the same scene element as the old view. If the Viewport is open, and this option is checked, then changing to a new view will cause the plugin to reload the scene into Octane.

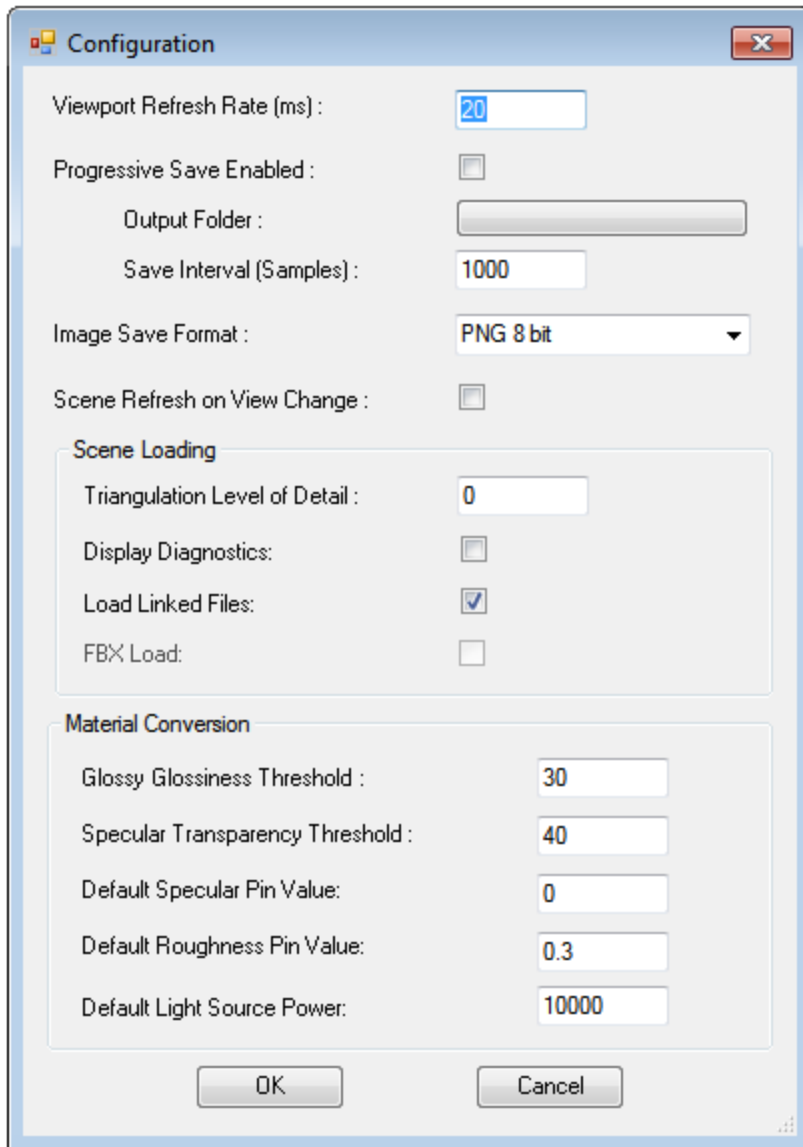
Triangulation Level of Detail – Scene loading (when opening the Viewport) will be fastest when this parameter is set to 0, and slowest when it is set to 1. When Triangulation Level of Detail is set to 0, the smoothness of curved surfaces and quality of UV mapping will be low quality, whilst at 1 these will be at the highest quality.

Display Diagnostics – If checked, a report window will be displayed after the Viewport is opened.

Load Linked Files – Check this option to load linked Revit file geometry into the Octane scene when opening the Viewport.

Material¹ Conversion – these parameters are unlikely to need to be changed, however you can mouseover each parameter for more information.

¹The representation of the surface or volume properties of an object.



config.xml

The above settings (and other temporary settings) are stored in a file which is in C:\Users\[user-name]\AppData\Local\OctaneRender for Revit. You can delete this file if you need to reset the plugin back to it's initial state.

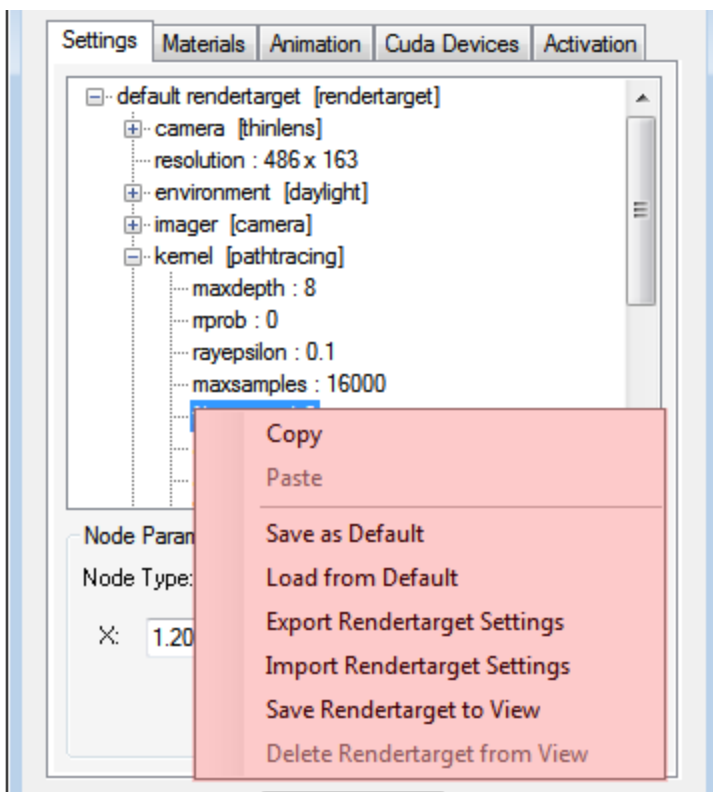
Settings Tab

The Settings Tab tree contains all the Octane nodes defining the scene rendering parameters (ie. All nodes connected to the "rendertarget" node EXCEPT the mesh pin). Click on any of the settings to enable the edit options in the Node Parameters window.

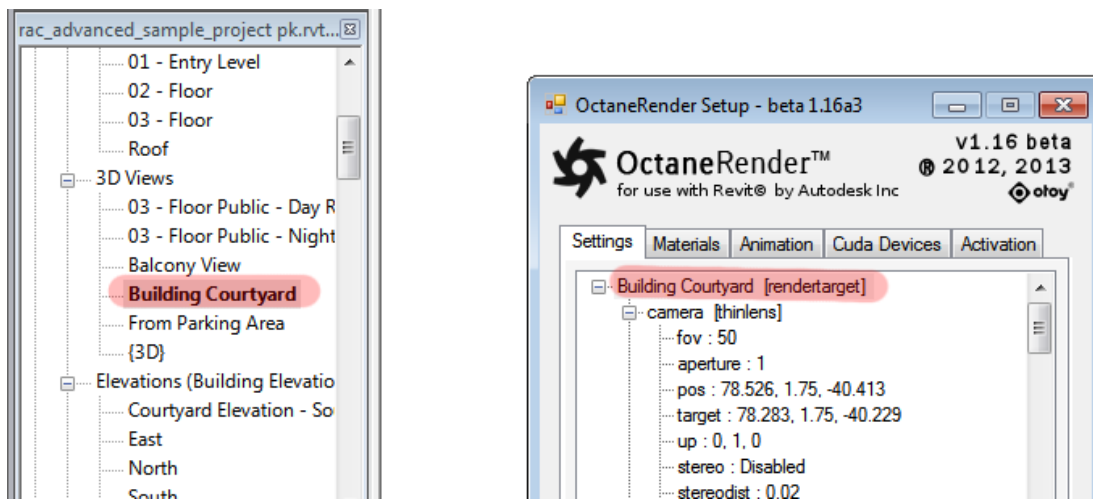
The main rendertarget pins are:

- Camera – Position, target, aperture, etc.
- Resolution – The output render resolution
- Environment – Scene lighting (IBL or daylight)
- Imager – Post-work functions which can be changed without restarting the render
- Kernel – The core rendering method
- Postproc – Additional post-processing functions which can be changed without restarting the render

Right-click the rendertarget tree for additional options:



- **Copy** – Copies the currently selected node into the plugin clipboard. Only one node can be in the clipboard at any given time.
- **Paste** – Pastes the clipboard node into the currently selected tree node. The Paste option will only be available when the clipboard node is compatible with the currently select node pin.
- **Load/Save as Default** – allows you to save the current rendertarget as the “default” to be used on all new scenes.
- **Import/Export Rendertarget Settings** – save the current rendertarget to disk for re-loading in other scenes. Very useful for saving image based lighting setups so they can be quickly reloaded.
- **Save Rendertarget to View** – Saves this rendertarget to the current view, so that any changes made to this rendertarget will then only be applied to that view. After saving the rendertarget to a view, the view name is set in the rendertarget pin name.



Octane Camera

All Octane camera controls are under the “rendertarget” tree in the Settings tab of the plugin.

The Octane camera “pos” and “target” are taken from the current Revit view camera position and view direction, and are always kept in sync. Panning, zooming and rotating the Revit camera will result in the same movement in the Octane camera. So to move the Octane camera, simply move the Revit camera.

The Octane camera “fov¹”, “aperture”, “up” vector and “lensShift” are NOT connected to the Revit camera or view. These parameters can be adjusted in the plugin Settings tab under “camera”. The default Revit **field of view**² is 50 degrees, so the plugin also defaults to 50.

¹The area that is visible to a camera lens usually measured in millimeters. A wide angle lens provides a larger field of view and a telephoto lens provides a narrow field of view.

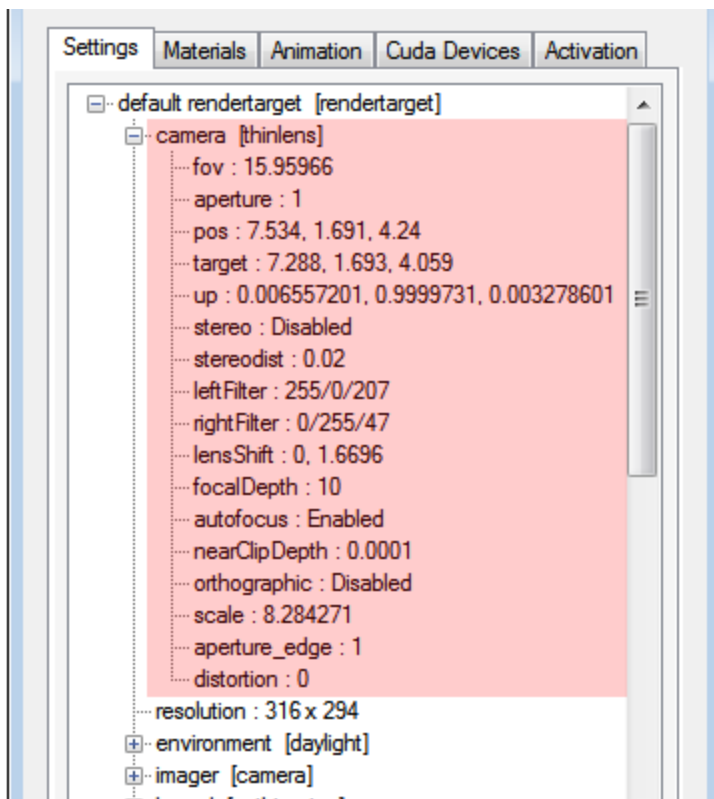
²The area that is visible to a camera lens usually measured in millimeters. A wide angle lens provides a larger field of view and a telephoto lens provides a narrow field of view.

Note: If you change the Revit View horizontal field of view (via the left or right view borders), you will need to manually adjust the Octane "fov" slider to match. So if you need to adjust the Revit View aspect ratio, you can adjust the height rather than width, so that the horizontal field of view does not change.

If the "A/F" button (focus pick) is enabled on the Viewport, you can click in the Octane Render Viewport to set the Octane "focalDepth" pin to the element distance that you clicked on. Doing so will also disable the "auto-focus" pin.

For interior renders, there may be situations where the camera is positioned inside a wall. In this case, increase the "nearClipDepth" to remove the wall from the rendered geometry.

It is not recommended that you adjust the "scale" pin unless you are in "orthographic" mode, since the "fov" value will override the "scale".

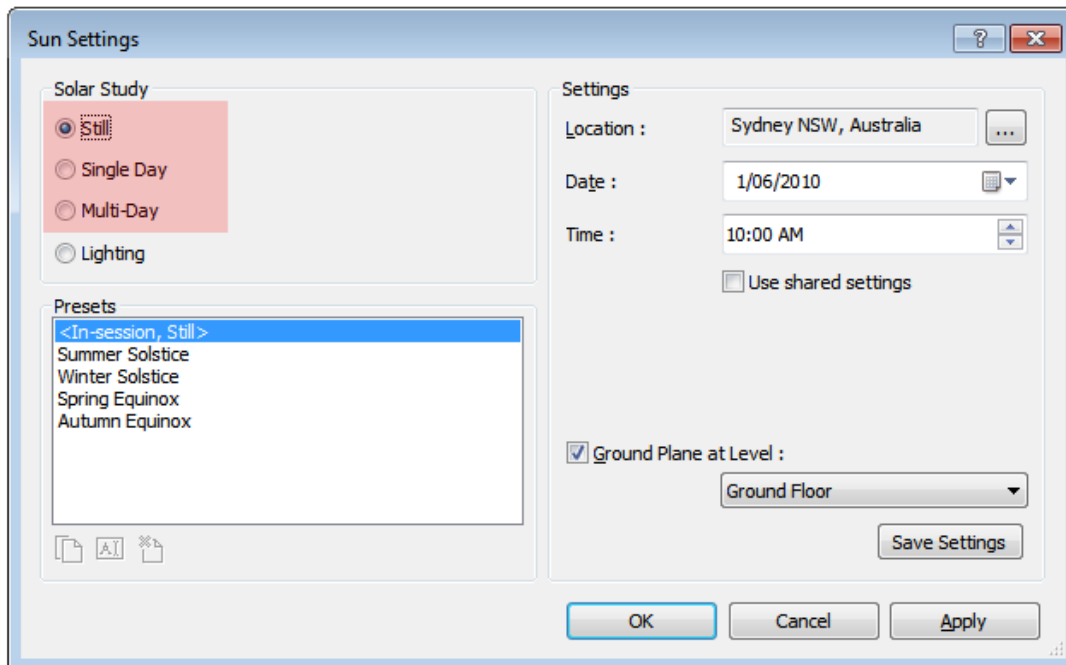


Octane Daylight, Emitters and Revit IBL

- "Octane Daylight" below
- "Emitters" on page 17
- "Image Based Lighting" on page 20

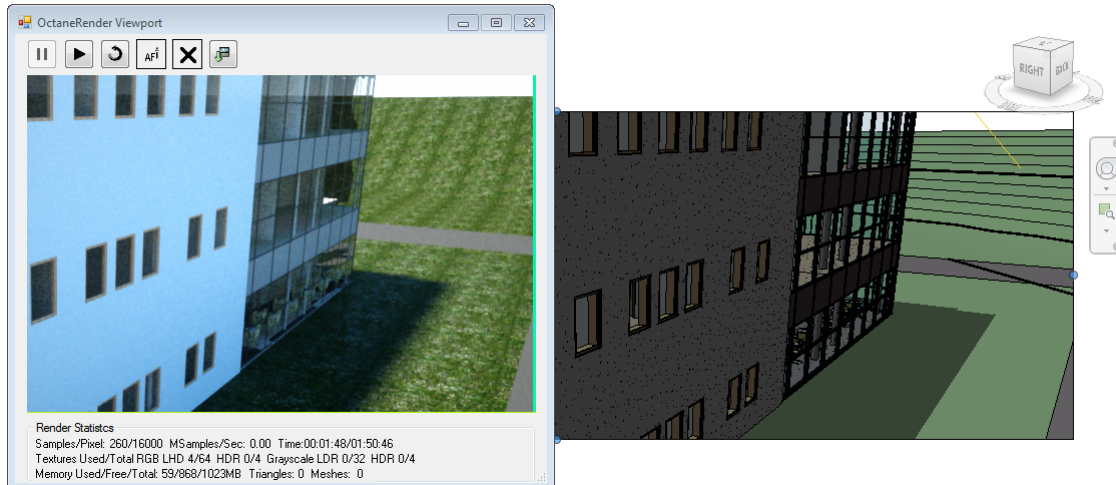
Octane Daylight

Go to the environment tree item under the rendertarget item in the Render Options List on the **Settings** tab, and change the default "texture environment" to "daylight". When the "environment" is set to "daylight", the sun position is automatically determined from the Revit sun position. So in the Revit **Sun Settings** screen, ensure Still, Single Day or Multi-Day as set (i.e., do not use Lighting).

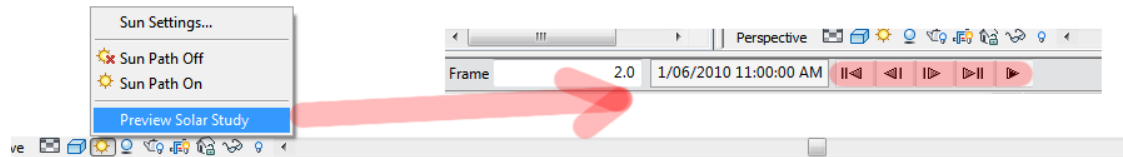


Important: For night renders, Revit does not provide a sun position on the other side of the globe. Instead it leaves the sun at the horizon. So for night renders, turn the Octane sun intensity ("power") to the minimum.

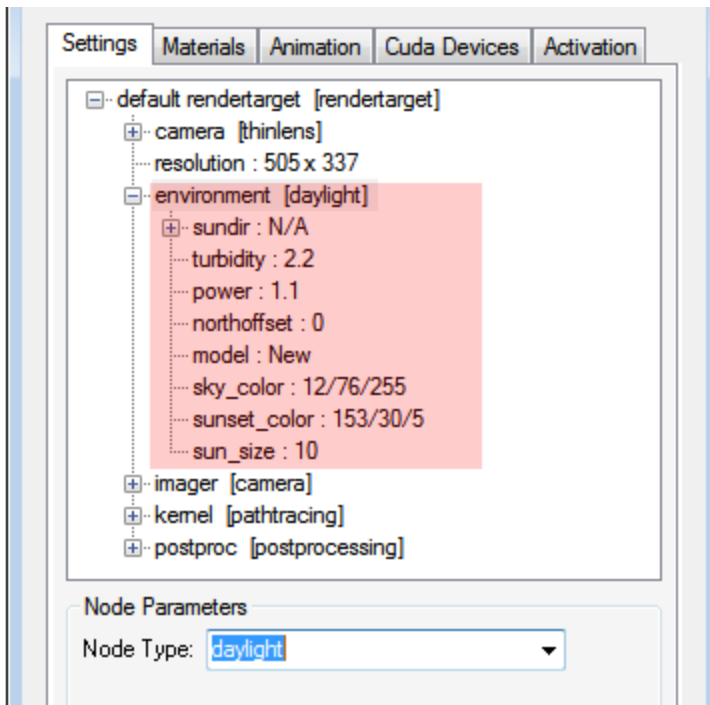
You can then control the sun position by changing the Time in the dialog above. You can also render Sun Studies (see "Sun Studies" on page 59). The Octane sun position will be synchronized to the Revit sun position exactly, as you can see below.



If you select "Single Day" or "Multi-Day" in the Revit **Sun Settings** dialog, you can preview the solar study whilst rendering to the Octane Viewport, and the Viewport sun position will be matched to the Revit sun position each frame.



The Octane "daylight" settings are as follows:

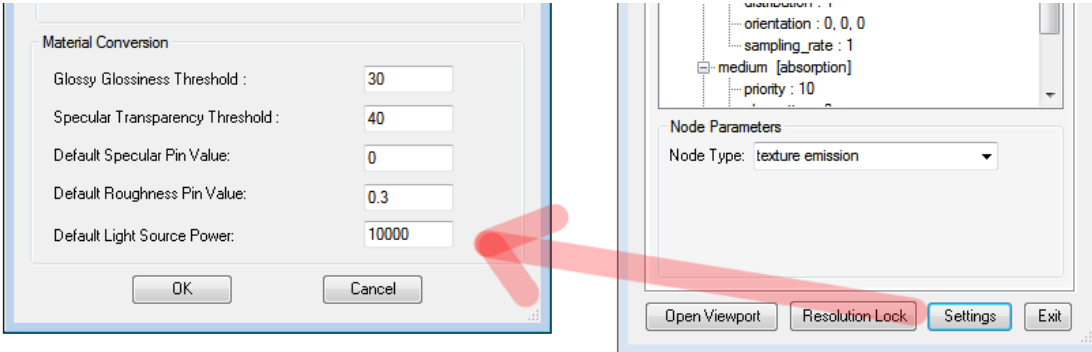


- "sundir" and "northoffset" as controlled via the Revit **Sun Settings** dialog, and cannot be changed in the Octane plugin window.
- "power" sets the sun power and for exterior renders should be in the range 0.8-1.2. For interior renders, you can increase the "power" substantially to illuminate the interior from sunlight through windows.
- "model" selects between the Old Octane daylight model and the New model. The New model is the recommended model to use.
- "turbidity" and "sun_size" can be used to adjust the sharpness of the sunlights and shadows. A low value creates sharp shadows (like on a sunny day) and a higher value diffuses the shadows similarly to a cloudy day.
- "sky_color" and "sunset_color" control the sky color at various times of the day.
- "sky_color", "sunset_color" and "sun_size" are only used with the New "model".

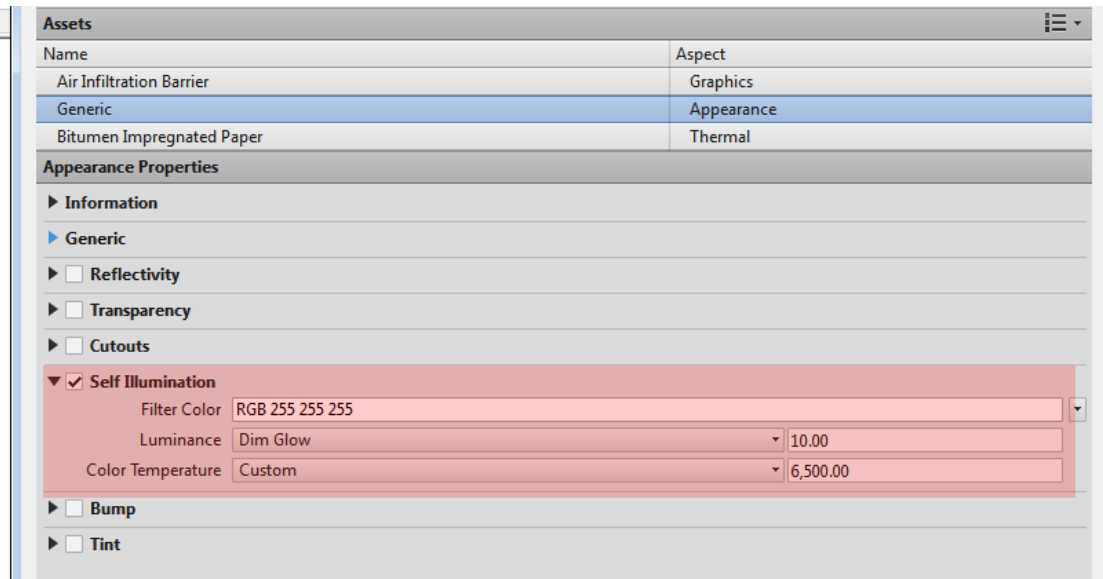
Emitters

Any emitters in your scene will be very low-polygon (ie. not high density meshes). You can use the standard Revit lighting objects as emitters, or add low-poly geometry in place of the light geometry. All light emitter materials should be setup with a very low opacity (i.e., approx 0.1).

Revit Geometry with a material named "Default Light Source" will automatically be converted to blackbody emitters. The default emitter power of this material can be set in the plugin Settings (Default Light Source Power).



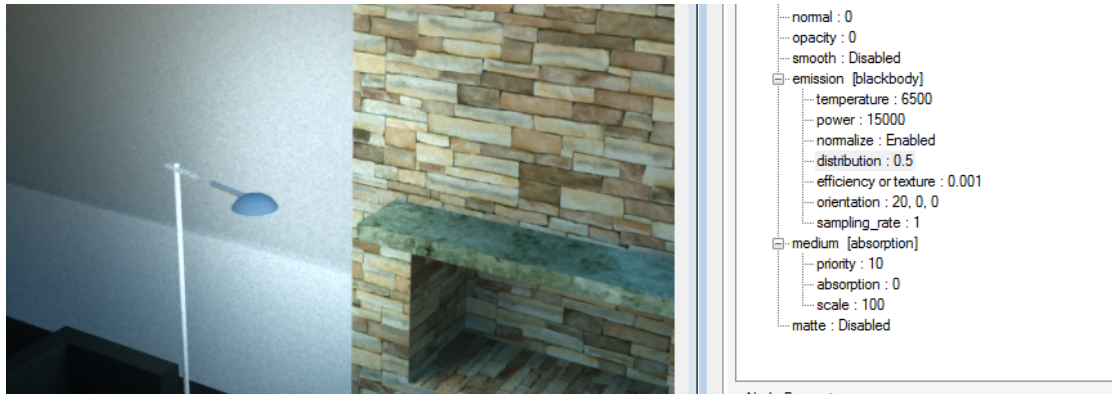
Revit Geometry with a material which has "Self Illumination" ON and a "Luminance" > 0 will also be converted to blackbody emitters, the power of which is determined from the **Luminance** setting, and the temperature from the Revit **Color Temperature** setting.



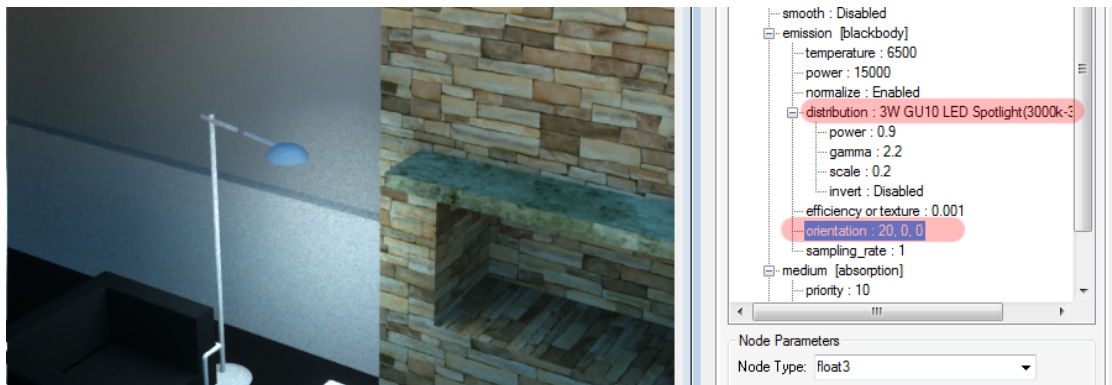
IES¹ Lighting

It is highly recommended that all emitter materials be setup with an IES distribution. This allows the emission of light to be distributed to certain parts of the scene. IES files can be downloaded from various sources, including [here](#).

With no IES file plugged into the “distribution” pin, the light spreads equality in all directions from the lamp.



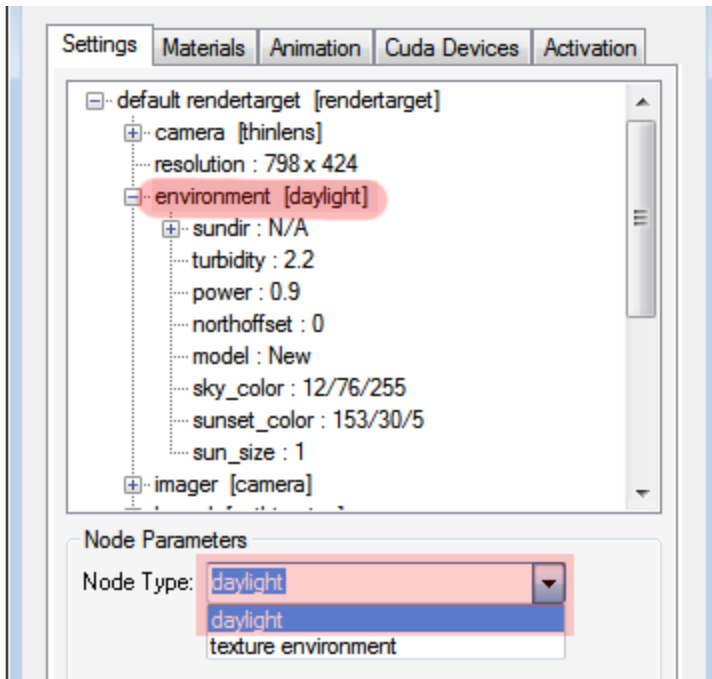
With an IES distribution file plugged into the “distribution” pin (as an “image” node), the light now only goes down. The direction of light can be controlled by the “orientation” pins. An “orientation” of 0, 0, 0 points the light direction down.



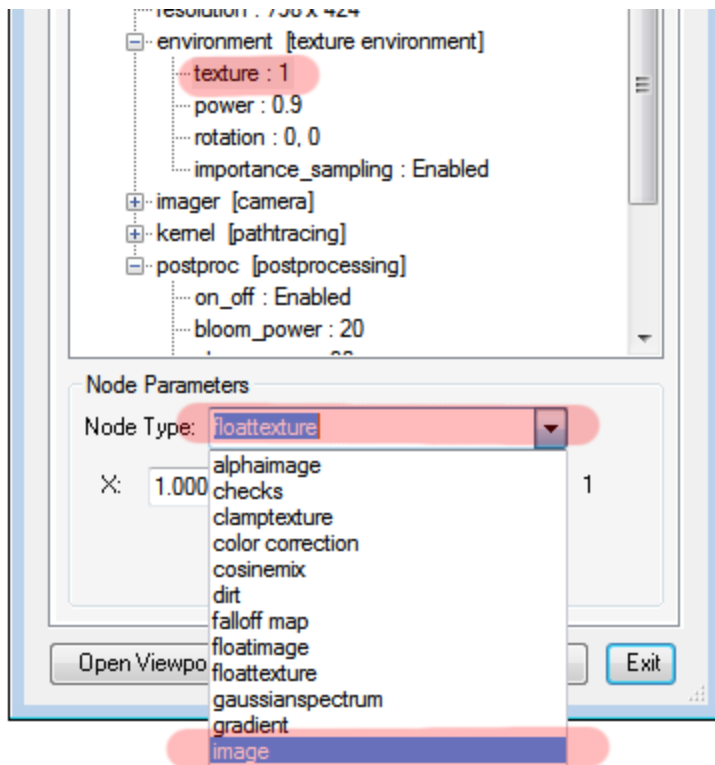
¹An IES light is the lighting information representing the real-world lighting values for specific light fixtures. For more information, visit <http://www.ies.org/lighting/>.

Image Based Lighting

To setup Image Based Lighting for a scene, select the “environment” pin from the **Settings** tree and change the node type to “texture environment”.

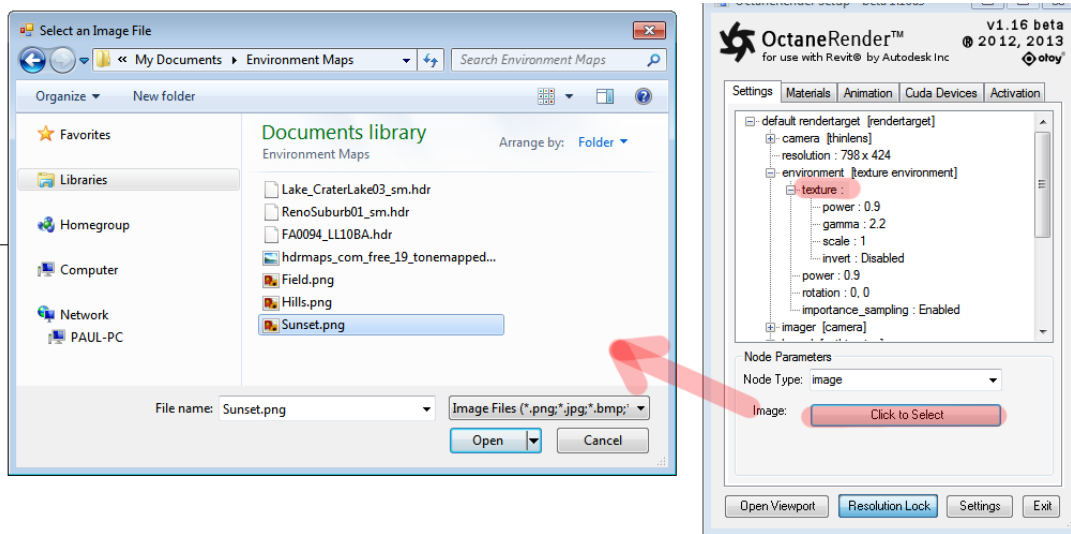


Then select the “texture” pin of the “environment” node, and change it’s node type to “image”.



Then to select an image (i.e., a lightprobe image) to illuminate the scene, select the “texture” node from the “environment” pin in the **Settings** tree of the plugin. Then click the image button in the **Node Parameters** box. Then select the **HDRI**¹ you wish to use to illuminate the scene.

¹An image which presents more than 8 bit per color channel unlike most common image formats.



Once the new image map is loaded, open the Viewport and adjust the scene lighting levels by changing the **power** slider in the **environment** node. Once you have the right light level, it is recommended that you export the rendertarget so that if you need to re-use that image in the future, you can simply import the render-target rather than selecting the image and finding the right power levels again. To do this, right-click the tree and select **Export Rendertarget Settings** from the popup menu.

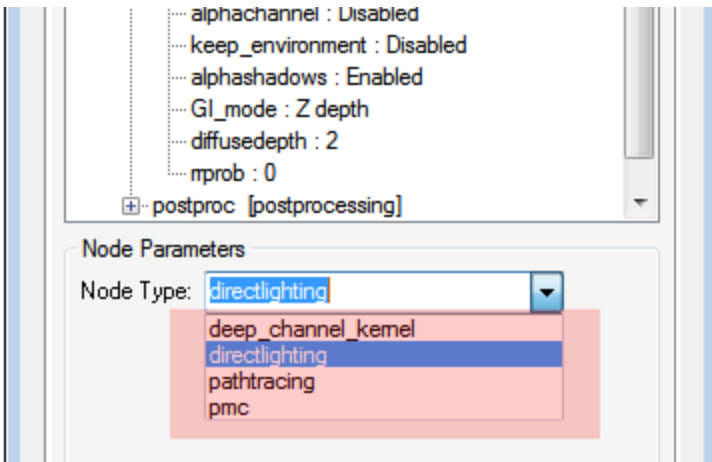
Note: Octane currently supports lat/long HDRI maps.

Rendering Kernels

There are four major rendering kernels in OctaneRender™: "Direct Lighting" on the next page, "Path Tracing" on page 26, "PMC" on page 28, and "Deep Channel Kernel" on page 30.

They are switchable by changing the type in the **Node Type** combo box.

In general, "directlighting" is used for drafts (although can be used for final copy), "pathtracing" and "pmc" are used for high quality rendering, and "deep_channel_kernel" is used for analytical output.



Direct Lighting

Direct Lighting is used for faster preview rendering. Direct Lighting is not unbiased and should not be used when you aim photo-realism but is useful when creating quick animations or renders.

Specular¹ Depth (speculardepth)

Specular depth controls the number of times a ray can be refracted before dying. Higher numbers mean higher render times but more color bleeding and more details in transparent materials. Low numbers can introduce artifacts, or turn some refractions into pure black.

Glossy² Depth (glossydepth)

Glossy depth controls the number of times a ray can be reflected before dying. Higher numbers mean higher render time. Low numbers under 4 can introduce artifacts, or turn some reflections into pure black. You should setup this setting based on the complexity of the scene you are working on, and especially based on how many reflective parallel surfaces you have.

AO Distance (aodist)

¹Amount of specular reflection, or the mirror-like reflection of light photons at the same angle. Used for transparent materials such as glass and water.

²The measure of how well light is reflected from a surface in the specular direction, the amount and way in which the light is spread around the specular direction, and the change in specular reflection as the specular angle changes. Used for shiny materials such as plastics or metals.

The distance of the ambient occlusion in units. Always check if the amount is right related to your model scale. For example you don't need an amount of 3 units if your object is a small toy. But if your model is a house or something large, you can increase the value. The more you increase the value the darker your render will be.

Ray Epsilon (rayepsilon)

The ray epsilon is the distance to offset new rays so they don't intersect with the originating geometry. This value should be left as the default.

Maximum Samples (maxsamples)

This sets the maximum number of samples per pixel before the rendering process stops. The higher the number of samples per pixel, the cleaner the render. There is no rule as to how many samples per pixel are required for a good render.

Filter Size (filtersize)

This sets the pixel size for filter for the render. This can improve aliasing artifacts in the render. If the filter is set too high, the image can become blurry.

Alpha Channel¹ (alphachannel)

This option removes the background and renders it as transparent (zero alpha). This can be useful if the user wants to composite the render over another image and does not want the background to be present.

Keep Environment (keep_environment)

This option is used in conjunction with the Alpha Channel setting. It allows the background to be rendered with zero alpha but is still visible in the final render. This allows even further flexibility in compositing images.

Alpha Shadows

This setting allows any object with transparency (specular materials, materials with opacity settings and alpha channels) to cast a shadow accordingly instead of behaving as a solid object.

GI Mode

¹A greyscale image used to determine which areas of a texture map are opaque and which areas are transparent.

There are five different Global Illumination modes in the Direct Lighting Kernel.

- **None (0):** Only direct lighting from the sun or area lights is included. Shadowed areas receive no contribution and will be black.
- **Ambient (1):** Use a simple ambient colour from the environment above.
- **Sample Environment (2):** Use a simple ambient colour from the environment/horizon. Together with ambient and none, these modes are all very fast, as no monte-carlo (sampling) is required. These give a very unrealistic, classic z-buffer/whitted raytracing style look, but are very fast, and very handy for interactive tuning of complex scenes or on slow hardware.
- **Ambient Occlusion (3):** Standard ambient occlusion.
- **Diffuse¹ (4):** Indirect diffuse, with a configuration to set the number of indirect diffuse bounces to include. This gives a GI quality that is in between direct/AO and pathtracing, without caustics and a decent realistic quality (much better than AO), but much faster than pathtracing/PMC. It is very good for quick finals and animations. It is similar in some ways to 'bruteforce' indirect GI in other engines.

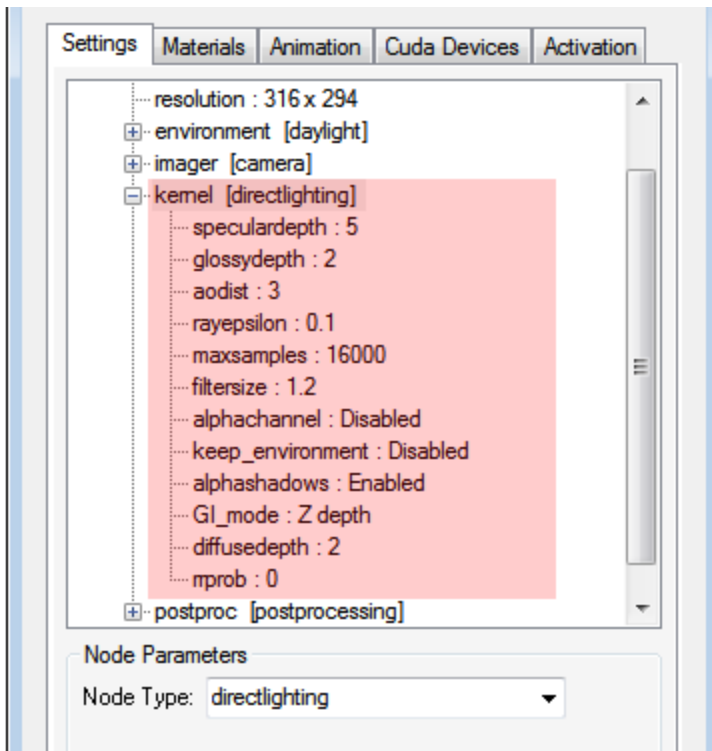
Diffuse Depth

Gives the maximum number of diffuse reflections if GI Mode is set to Diffuse (4).

Russian Roulette Probability (rrprob)

In path tracing, maxdepth is the maximum amount of bounces a ray can make, but, after 3 bounces, there is a 50 % chance that the ray is killed, if you set the rrprob parameter to 0.5. So in practice it will rarely exceed more than 16-20 bounces once every million pixel samples (generating a firefly usually). If the rrprob is set to 0, it uses a automatic setting. If it is set to anything else, the user directly controls the probability the ray is ended at random after 3 bounces and so forth.

¹Amount of diffusion, or the reflection of light photons at different angles from an uneven or granular surface. Used for dull, non-reflecting materials or mesh emitters.



Path Tracing

Path Tracing is best used for realistic results. The render times are higher than Direct Lighting but the results can be photorealistic. It can have some difficulties with small light sources and proper caustics.

Maximum Depth (maxdepth)

The maximum number of times a ray can bounce/reflect/refract in a surface. Higher amounts mean also higher render time but more realistic results. For outdoor renders a good setting is around 4 maxdepth. For lighting interior with natural light (the sun and the sky) you will need higher settings such as 8 or higher. While high values are possible, in reality rays will not usually go beyond 16 ray depth.

Russian Roulette Probability (rrprob)

The RRprob is the probability of terminating the path randomly during raytracing. This value should be left as the default. A value of zero allows OctaneRender™ to determine the value.

Ray Epsilon (rayepsilon)

The ray epsilon is the distance to offset new rays so they don't intersect with the originating geometry. This value should be left as the default.

Maximum Samples (maxsamples)

This sets the maximum number of samples per pixel before the rendering process stops. The higher the number of samples per pixel, the cleaner the render. There is no rule as to how many samples per pixel are required for a good render.

Filter Size (filtersize)

This sets the pixel size for filter for the render. This can improve aliasing artifacts in the render. If the filter is set too high, the image can become blurry.

Alpha Channel¹ (alphachannel)

This option removes the background and renders it as transparent (zero alpha). This can be useful if the user wants to composite the render over another image and does not want the background to be present.

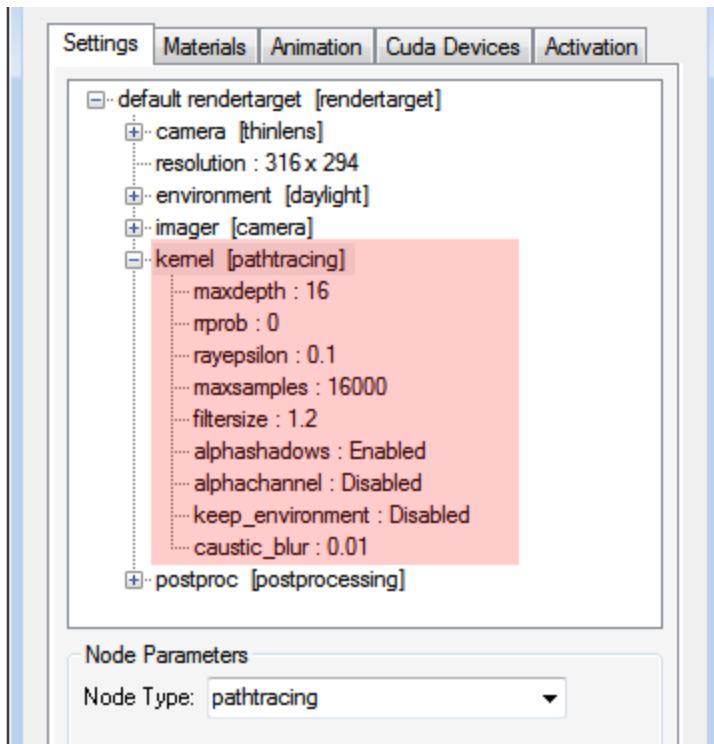
Keep Environment (keep_environment)

This option is used in conjunction with the Alpha Channel setting. It allows the background to be rendered with zero alpha but is still visible in the final render. This allows even further flexibility in compositing images.

Alpha Shadows (alphashadows)

If alpha maps are used in the scene, this setting controls whether the shadows will be calculated from the mesh geometry or from the alpha map.

¹A greyscale image used to determine which areas of a texture map are opaque and which areas are transparent.



PMC

PMC is a custom mutating unbiased kernel written for GPUs. It allows for complex caustics and lighting to be resolved.

Maximum Depth (maxdepth)

The maximum number of times a ray can bounce/reflect/refract in a surface. Higher amounts mean also higher render time but more realistic results. For outdoor renders a good setting is around 4 maxdepth. For lighting interior with natural light (the sun and the sky) you will need higher settings such as 8 or higher. While high values are possible, in reality rays will not usually go beyond 16 ray depth.

Russian Roulette Probability (rrprob)

The RRprob is the probability of terminating the path randomly during raytracing. This value should be left as the default. A value of zero allows OctaneRender™ to determine the value.

Ray Epsilon (rayepsilon)

The ray epsilon is the distance to offset new rays so they don't intersect with the originating geometry. This value should be left as the default.

Maximum Samples (maxsamples)

This sets the maximum number of samples per pixel before the rendering process stops. The higher the number of samples per pixel, the cleaner the render. There is no rule as to how many samples per pixel are required for a good render.

Filter Size (filtersize)

This sets the pixel size for filter for the render. This can improve aliasing artifacts in the render. If the filter is set too high, the image can become blurry.

Alpha Channel¹ (alphachannel)

This option removes the background and renders it as transparent (zero alpha). This can be useful if the user wants to composite the render over another image and does not want the background to be present.

Keep Environment (keep_environment)

This option is used in conjunction with the Alpha Channel setting. It allows the background to be rendered with zero alpha but is still visible in the final render. This allows even further flexibility in compositing images.

Alpha Shadows (alphashadows)

If alpha maps are used in the scene, this setting controls whether the shadows will be calculated from the mesh geometry or from the alpha map.

Exploration Strength (exploration_strength)

This specifies how long the kernel investigates good paths before it tries to find a new path. Low values can create a noisy image while larger values can create a splotchy image.

Direct Light Importance (direct_light_importance)

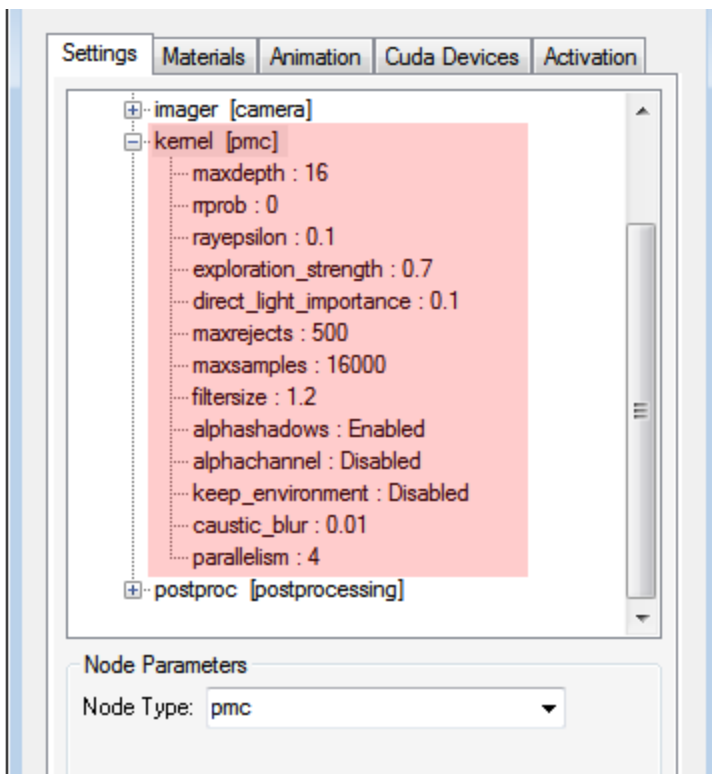
¹A greyscale image used to determine which areas of a texture map are opaque and which areas are transparent.

The direct light importance makes the kernel focus more on paths with indirect light. For example, imagine sunlight through a window creates a bright spot on the floor. If the direct light importance is 1, the kernel would sample this area a lot, although it becomes clean very quickly. If the direct light importance is reduced, the kernel reduces its efforts to sample that area and focuses more on more tricky areas that are more difficult to render.

Max Rejects (maxrejects)

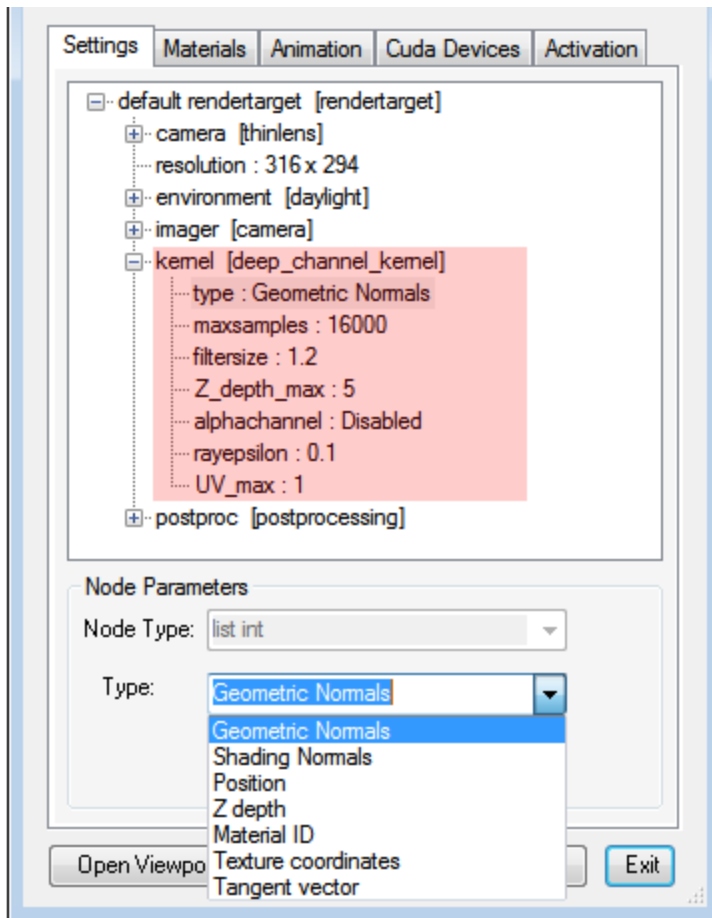
This can control the bias of the render. By reducing the value, the result will be more biased, but the render time will be shorter.

For interior render done with emitters, or where light is illuminating the scene through specular materials, a high (1.0) "caustic_blur" value is recommended to reduce the time it takes to remove noise from the render.



Deep Channel Kernel

The deep_channel_kernel creates false-color images of the scene, containing various types of information about the scene. In scenes where the environment is visible you should enable the alpha channel.



The following settings are available:

- **Geometric normals:** the vectors perpendicular to the triangle faces of the mesh.
- **Shading normals:** the interpolated normals used for shading. This does not take into account the bump map of the object. For objects without smoothing this is identical to the geometric normals.
- **Position:** The position of the first intersection point.
- **Z-depth:** The distance between the intersection point and the camera, measured parallel to the view vector.
- **Material¹ ID:** Every material pin is represented as a separate color.
- **Texture Coordinates**

¹The representation of the surface or volume properties of an object.

For display these values are scaled to get values approximately between 0 and 1. All tone mapping settings except for `min_display_samples` and `gamma` are ignored. Exposure is enabled for Z-depth, and will indicate the value which gets mapped to white. To save these channels you should use untonemapped **EXR**¹.

The example below shows a **Z-Depth**² render.



Adjusting Rayepsilon

The “rayepsilon” pin in the kernel nodes is used to ensure that geometry does not cast shadows on itself, so provides a gap between surfaces when calculating shadows. For close-up rendering, it should be set low, so that these gaps are not visible. For “distance” renders, where the camera is a long way from the rendered geometry, the “rayepsilon” will need to be increased, since the geometry being rendered will be a long way from the camera and the vertices will appear to the Octane renderer to be at the same points in space (and thus cause shadow artifacts with a low “rayepsilon”).

In summary:

- For close-up interior rendering, the recommended “rayepsilon” is 0.01.
- For exterior renders, the recommended “rayepsilon” is 0.075.

¹Also known as OpenEXR. This image file format was developed by Industrial Light & Magic and provides a High Dynamic Range image capable of storing deep image data on a frame-by-frame basis.

²A measure of object distances from the camera typically represented as a grayscale image.

Note: A "rayepsilon" of 0.075 = 7.5cms.

Post Processing

To add and adjust post processing effects, select:

rendertarget -> postproc

On/Off (on_off)

This is a boolean value used to enable or disable post-processing effects on the resulting render. Post-processing is disabled by default.

Bloom Power

Controls the size of the glow originating from an emitter, the size of the halo of light originating from the sun and/or concentrated light on reflective glossy materials to add a bloom effect to the rendered image.

Glare Power

Controls the size of the visible rays originating from an emitter, the size of the glare originating from reflective glossy materials at a point where concentration of light is at the highest to add a glare effect to the rendered image.

Glare Ray Amount

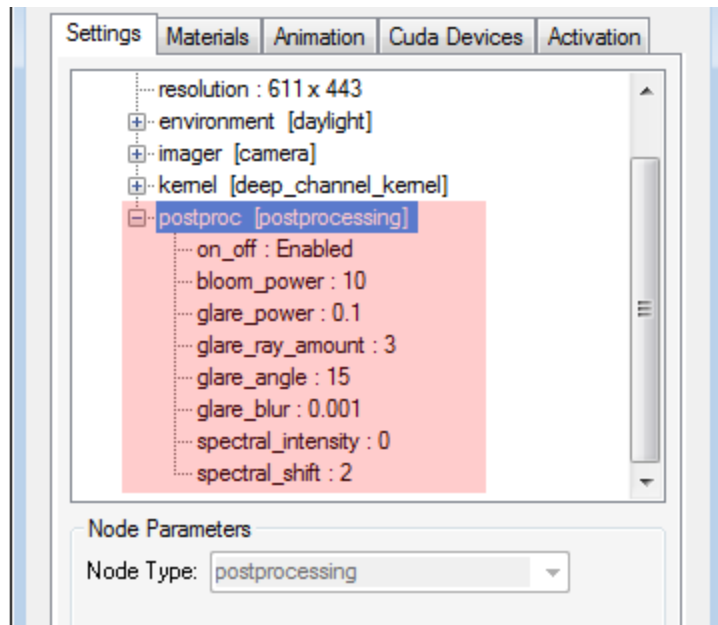
Controls the number of visible rays radiated or reflected.

Glare Angle

This is used to adjust the direction of the glare relative to the object. A glare angle of -90 and 90 results to one main horizontal glare, and a glare angle of 0 results to one main vertical glare.

Glare Blur

Controls the sharpness of the glare. Smaller values will result to a crisp linear glare and this is softened as the value is adjusted and set higher.



Materials Tab

The **Materials**¹ Tab displays a list of all the Revit materials, along with the Octane node structure that those materials were converted to.

Material² Conversion

The first time a Revit material is selected from the plugin, the plugin will convert that Revit material to an Octane material. When this happens, the Octane material should be the “master copy” of that material, since changing the Revit material will not automatically change the Octane material. If you need to at any point, you can re-convert the Revit material to an Octane material by rightclicking the material tree and selecting **Re-Convert From Revit**.

All materials from the standard “Autodesk Materials” library and the “AFC Materials” library should bring across their default texturemaps when the plugin converts from a Revit material to an Octane material. However the texturemaps/bump maps for other materials (not in the above 2 libraries) will NOT be brought across from converted from the Revit to the Octane material (this is a limitation within Revit). In this case, manually load the texturemap/bump maps into the Octane material, and set the image “scale”, and then rightclick the material

¹A set of attributes or parameters that describe surface characteristics.

²The representation of the surface or volume properties of an object.

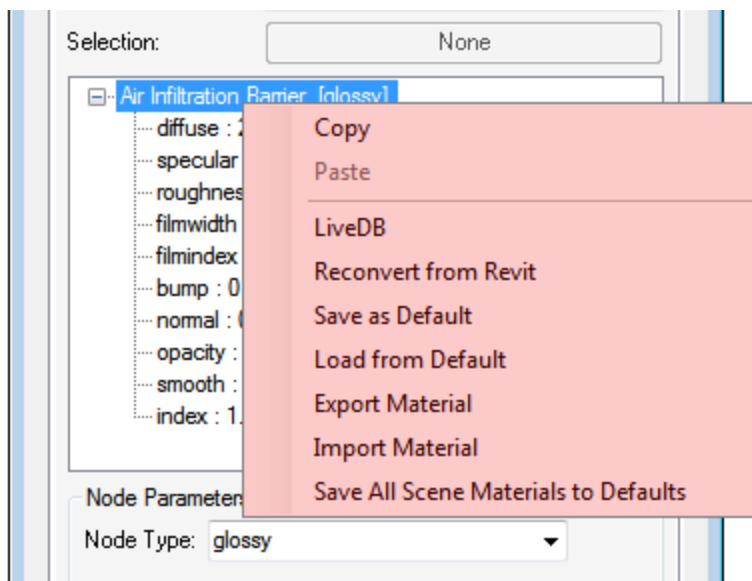
tree and select "Save as Default". Then when that material is next used in a scene, the material conversion will pickup the Octane material you saved as the default, thus picking up the texturemap, bump maps and scale you manually setup.

Material Tab Controls

Scene Materials – This combo box contains a list of all Revit materials in the scene. Selecting a material from this box will present the Octane material for that Revit material in the tree structure.

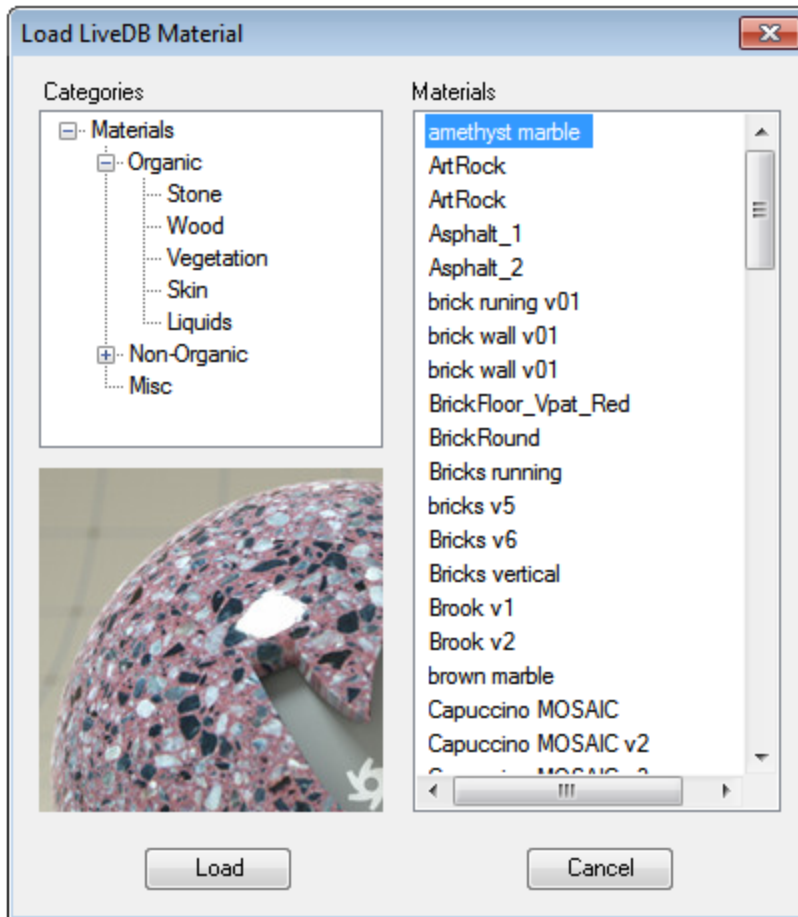
- **Selection Materials** – This popup box contains a list of all Revit materials for the elements that are currently selected in Revit. Selecting a material from this box will present the Octane material for that Revit material in the tree structure.
- **Selection** – This is a button which becomes available if you select a single Revit element which has a location (i.e., a Component). Pressing this button allows the selected element with be proxied and instanced (see Geometry Proxies and **Instancing**¹).
- **Material editing tree** – each tree item represents an Octane node pin. Click on any item, and the edit options for that pin will appear the the **Node Parameters** box. You can change the node type by selecting a different node type in the **Node Type** popup control (only node types compatible with the selected Octane node pin will be available).

Right-click the tree for additional options:



¹Instancing an object means taking a single imported mesh object, such as an OBJ or an FBX and making multiple copies, each of which can be placed in different parts of the scene. This saves an enormous amount of computational resources because only a single object is loaded into the scene.

- **Copy** – Copies the currently selected node into the plugin clipboard. Only one node can be in the clipboard at any given time.
- **Paste** – Pastes the clipboard node into the currently selected tree node. The Paste option will only be available when the clipboard node is compatible with the currently select node pin.
- **LiveDB** – This option allows you to load a material from the Octane LiveDB database into the currently selected material. To select from the LiveDB, select the category from the Categories tree, and then selecting Materials will fill the preview window. Click OK once you have the required material.



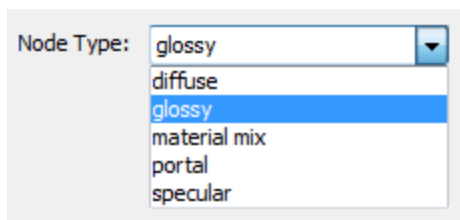
- **Re-Convert From Revit** – Select this option to reconvert the selected Revit material to an Octane material.
- **Load/Save as Default** – If you save this Octane material as a default, when this Revit material next needs to be converted for a scene, the saved default will be used. **It is highly recommended that**

you save all materials as a default as you edit them in order to minimise the amount of effort required to edit Octane material for each new scene. Defaults are saved in the Users[username]AppDataLocalOctaneRender for RevitDefaults folder (on Windows 7).

- **Import/Export Material** – Allows you to save and load materials into the currently selected Octane material. Material exports are saved in the Users[username]AppDataLocalOctaneRender for RevitExport folder (on Windows 7).
- **Save All Materials To Defaults** – This option saves all the converted (and modified) materials from the Revit scene as Octane default materials, so they will be next used on a new scene.

Materials

OctaneRender™ has five basic materials: "Diffuse Material" below, "Glossy Material" on page 39, "Mix Material" on page 40, "Portal Material" on page 41, and "Specular Material" on page 42.



Diffuse Material

Diffuse¹ materials do not reflect light, and have the following parameters to adjust:

Bump / Normal

The Diffuse value gives the material its color.

Bump / Normal

Both the Bump and Normal channels can load images to control the amount of bump mapping and normal mapping. The Bump channel should be set to floatimage to load a bump map. The Normal channel should be set to the image data type to load a full color normal map.

¹Amount of diffusion, or the reflection of light photons at different angles from an uneven or granular surface. Used for dull, non-reflecting materials or mesh emitters.

Opacity

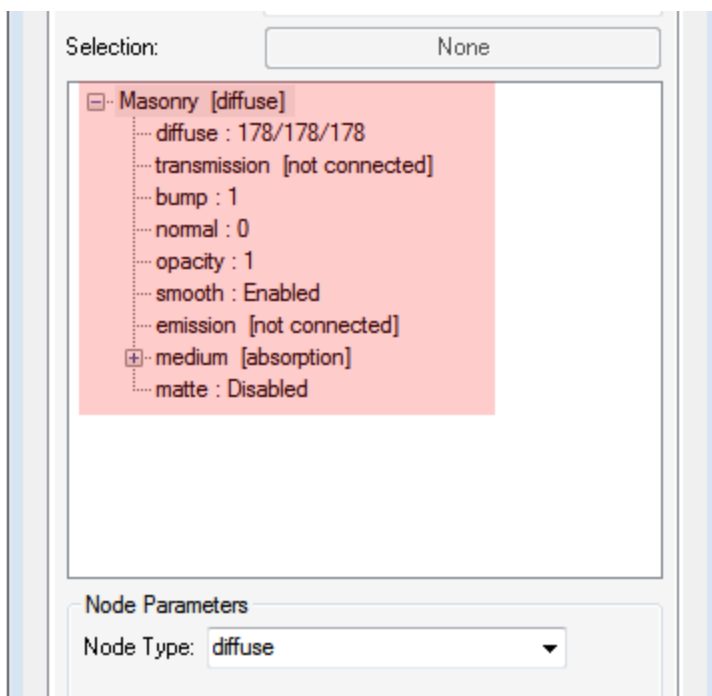
Opacity sets the transparency of the material. Set the data type to `alphaimage`(if the image has an alpha channel) or `floatimage` (for black/white images) to load an image to set the transparency (use the `Invert` checkbox if necessary to adjust whether black or white regions are considered transparent).

Normal Smoothing

Normal Smoothing is a Boolean value that sets whether to smooth the normals of all meshes sharing that material. When off, the materials can be faceted and polygonal.

Emission

The Emission setting controls whether the material acts as a light source.



Glossy Material

Glossy¹ materials have some light reflection, and have the following parameters to adjust:

Diffuse² (diffuse)

The value gives the material its color.

Specularity (specular)

The value determines the amount of specularity on the mesh.

Film Width (filmwidth)

This controls the thickness of a optical, thin film on the material. This is useful in creating rainbow or oil slick effects.

Film Index (filmindex)

This controls the Index of Refraction of the thin film.

Roughness

The roughness determines the amount of reflection that will be present. A low roughness value will create blurry reflections and a high value will produce a mirror like reflection.

Bump / Normal

Both the Bump and Normal channels can load images to control the amount of bump mapping and normal mapping (respectively). The Bump channel should be set to floatimage to load a bump map. The Normal channel should be set to the image data type to load a full color normal map.

Opacity

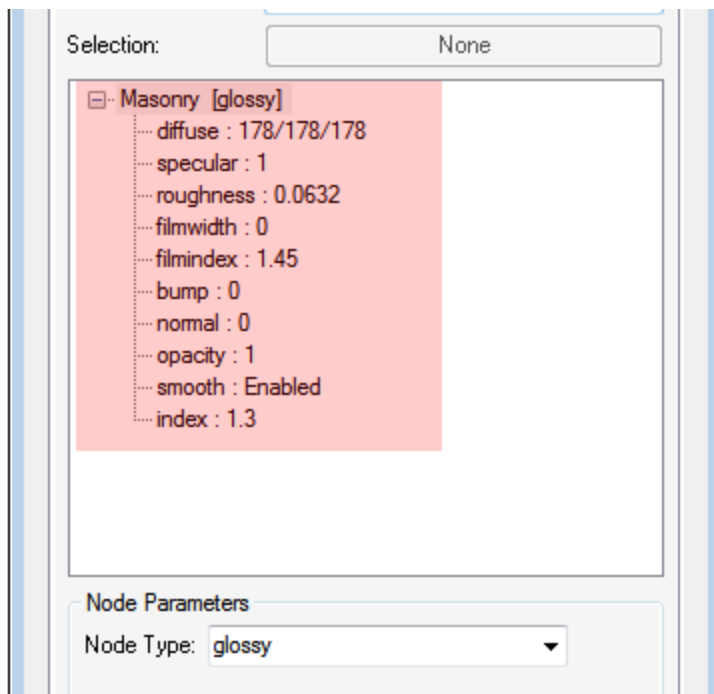
¹The measure of how well light is reflected from a surface in the specular direction, the amount and way in which the light is spread around the specular direction, and the change in specular reflection as the specular angle changes. Used for shiny materials such as plastics or metals.

²Amount of diffusion, or the reflection of light photons at different angles from an uneven or granular surface. Used for dull, non-reflecting materials or mesh emitters.

Opacity sets the transparency of the material. Set the data type to `alphaimage`(if the image has an alpha channel) or `floatimage`(for black/white images) to load an image to set the transparency (use the Invert checkbox if necessary to adjust whether black or white regions are considered transparent).

Normal Smoothing

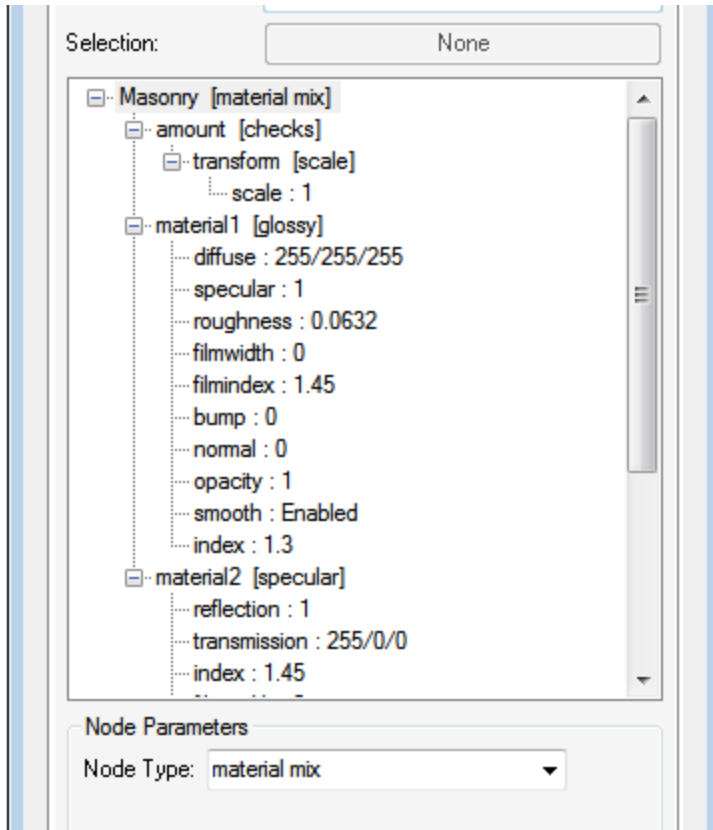
Normal Smoothing is a Boolean value that sets whether to smooth the normals of all meshes sharing that material. When off, the materials can be faceted and polygonal.



Mix Material

The **Material**¹ Mix option is used to combine two different materials. It accepts any two material nodes and a texture to control the mix. In the example below, a white glossy material is mixed with a red specular material. A checker texture node is used to control the mixing of the two materials.

¹The representation of the surface or volume properties of an object.

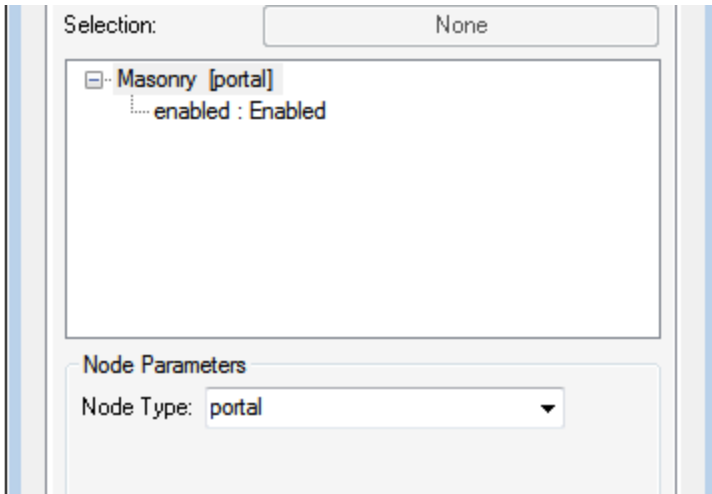


Portal Material

The **Portal**¹ **Material**² option is used in pathtracing type kernels ; e.g., "pathtracing" and "pmc" and not direct-lighting/ambient occlusion. Please refer to the Otoy forum [Resources and Sharing](#) for a tutorial on using portals.

¹A technique that assists the render kernel with exterior light sources that illuminate interiors. In interior renderings with windows, it is difficult for the path tracer to find light from the outside environment and optimally render the scene. Portals are planes that are added to the scene with the Portal material applied to them.

²The representation of the surface or volume properties of an object.



Specular Material

Specular¹ materials are transparent surfaces (i.e., glass) and have the following parameters to adjust:

Reflection

The Reflection value determines the glossiness of the mesh.

Transmission²

The Transmission value gives the base color to the mesh.

Index

The Index represents the Index of Refraction of the material. Standard values of Index of Refraction (IOR) can be readily found via searching the internet. Glass typically has a value of 1.53 and water 1.33.

Film Width (filmwidth)

This controls the thickness of a optical, thin film on the material. This is useful in creating rainbow or oil slick effects.

¹Amount of specular reflection, or the mirror-like reflection of light photons at the same angle. Used for transparent materials such as glass and water.

²A surface characteristic that determines if light may pass through a surface volume.

Film Index (filmindex)

This controls the Index of Refraction of the thin film.

Bump / Normal

Both the Bump and Normal channels can load images to control the amount of bump mapping and normal mapping (respectively). The Bump channel should be set to floatimage to load a bump map. The Normal channel should be set to the image data type to load a full color normal map.

Opacity

Opacity sets the transparency of the material. Set the data type to alphaimage if the image has an alpha channel or floatimage (for black/white images) to load an image to set the transparency. Use the **Invert** checkbox if necessary to adjust whether black or white regions are considered transparent.

Normal Smoothing

Normal Smoothing is a Boolean value that sets whether to smooth the normals of all meshes sharing that material. When off, the materials can be faceted and polygonal.

Dispersion Coefficient (dispersion_coefficient_B)

The dispersion in OctaneRender™ is based on Cauchy's equation which has two terms: A which is the index of refraction and B which is the dispersion coefficient. Increasing the value increases the amount of coloration and dispersion in the object and in caustics.

Absorption¹

Absorption means that the material slightly absorbs light while passing through. The color resulting from this absorption is dependent on the distance light travels through the material. With increased distance it will get darker, and if the absorption is colored it will get more saturated.

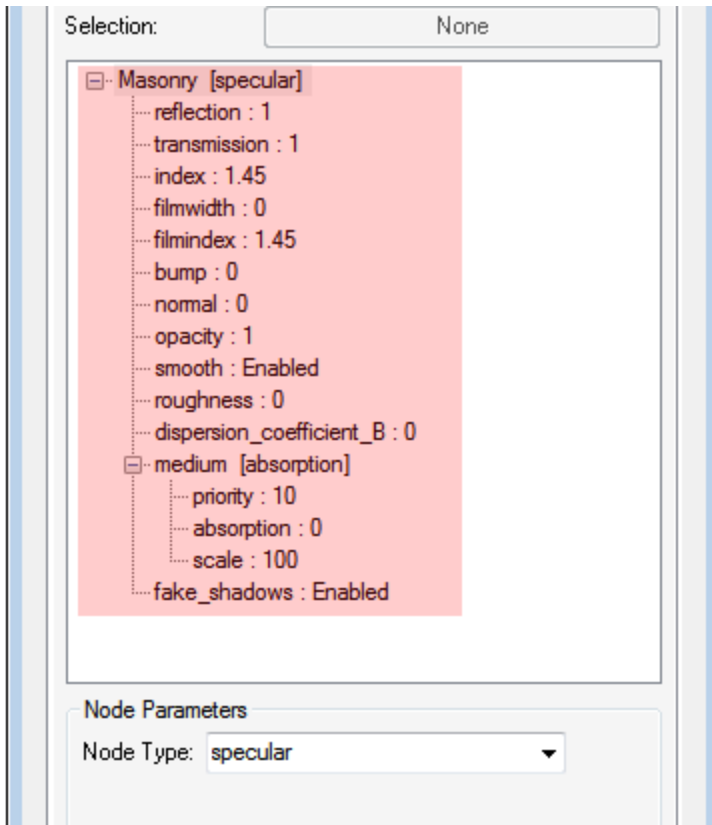
Absorption Color (absorption_color)

The absorption color gives the spectrum remaining from white light after traveling through the material for a certain distance. Only constant colors are supported correctly.

¹Defines how fast light is absorbed while passing through a medium.

Depth of Absorption (depth_of_absorption)

The Depth of Absorption specifies the aforementioned distance (in meters). The smaller this distance, the stronger the absorption will be.

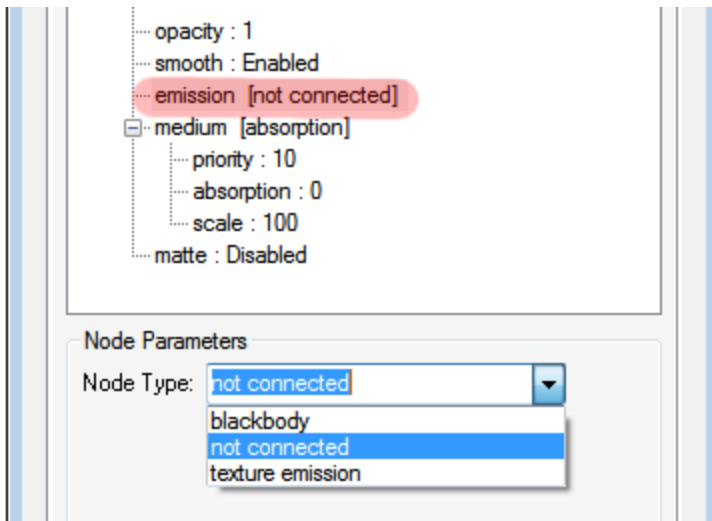


Emissions

In order to use a mesh as a light source, it needs to be changed to a **Diffuse material**¹ type. The Emission parameter has two different options: "blackbody" and "texture emission".

By default, the "emission" pin is not connect to either "blackbody" or "texture emission" nodes, and is in a "not connected state".

¹Used for dull, non-reflecting materials or mesh emitters.



The following are listed for the “blackbody” emission settings, but many of them are shared with the “texture emission” settings. The main difference is whether the colour comes from the Blackbody temperature or from the texture settings of the diffuse material.

- **Temperature** – The temperature (in K) of the light emission.
- **Power** – This is the wattage of the light source. Each light in the scene should be set to its real world wattage. For example, a desk lamp could be set to 25 watts, a ceiling lamp to 100 watts, and an LED light to 0.25 watts. This setting should not be used to balance the lighting power of the scene.
- **Efficiency or Texture** – This setting is used to set the efficiency of the light source. No light is 100% efficient at delivering the power at the specified wattage (a 100 watt light bulb does not actually deliver 100 watts of light). The efficiency setting can be used to enter the real-world values.

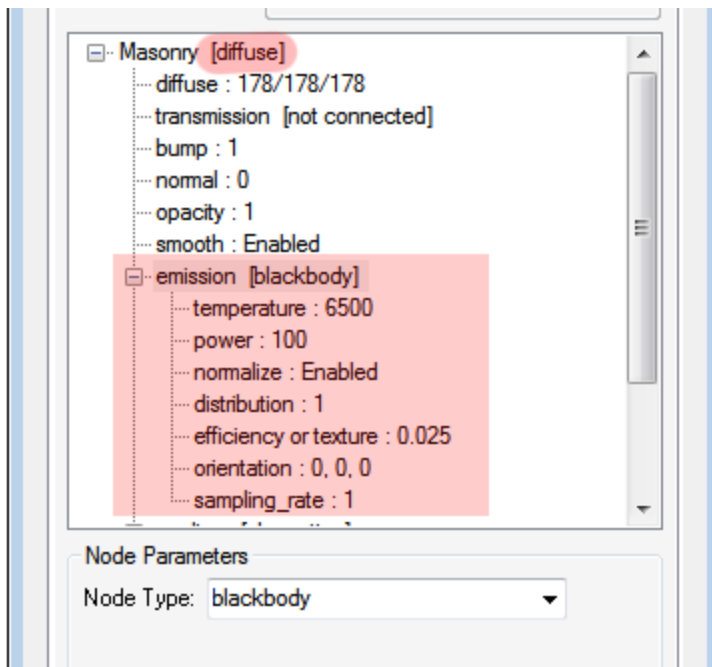
These values can be used to create very realistic light settings. For example, a standard 100-watt incandescent bulb would only be approximately 2.0% efficient where as a 25 watt compact fluorescent light will be 10% efficient. These will both produce around the same quantity of light in real life.

- **Orientation** – This setting is used to adjust the direction the light is pointed in the scene. This setting only affects lights using a non-uniform distributions (textures or **IES**¹ files).
- **Distribution** – The distribution controls the pattern of the light. This can be set to an Float texture and an image or IES file can be loaded.

¹An IES light is the lighting information representing the real-world lighting values for specific light fixtures. For more information, visit <http://www.ies.org/lighting/>.

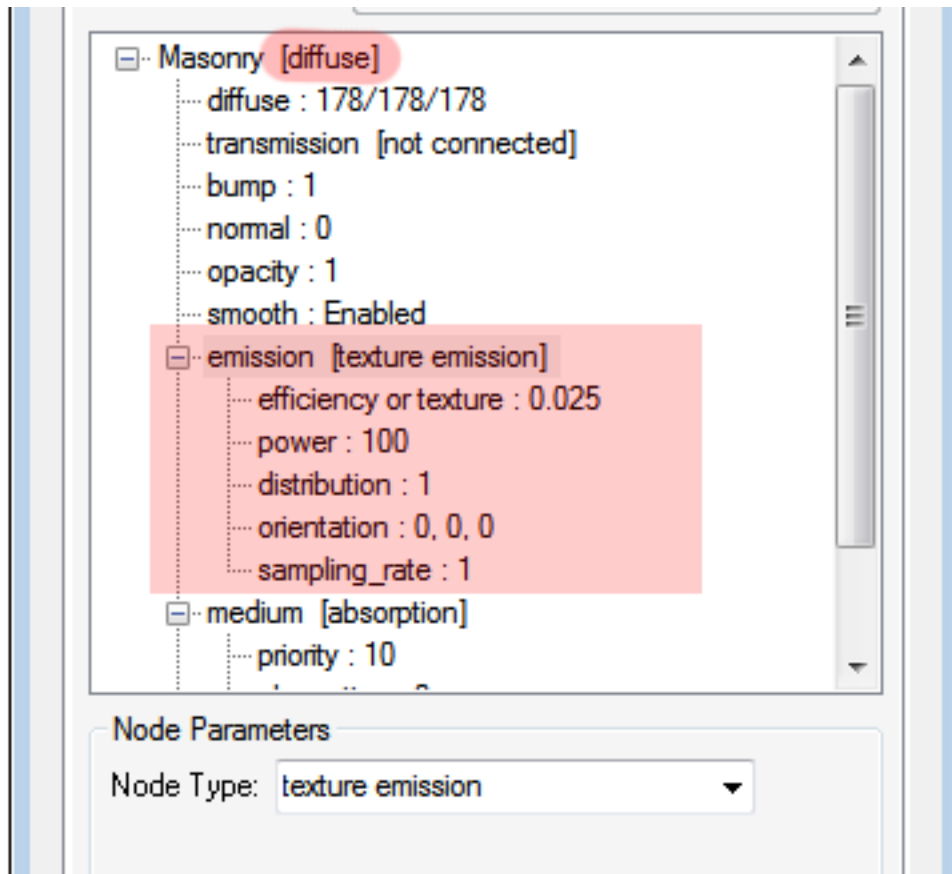
Blackbody Emission

The Blackbody Emission type uses Colour Temperature (in Kelvin) and Power to control the colour and intensity of the light.



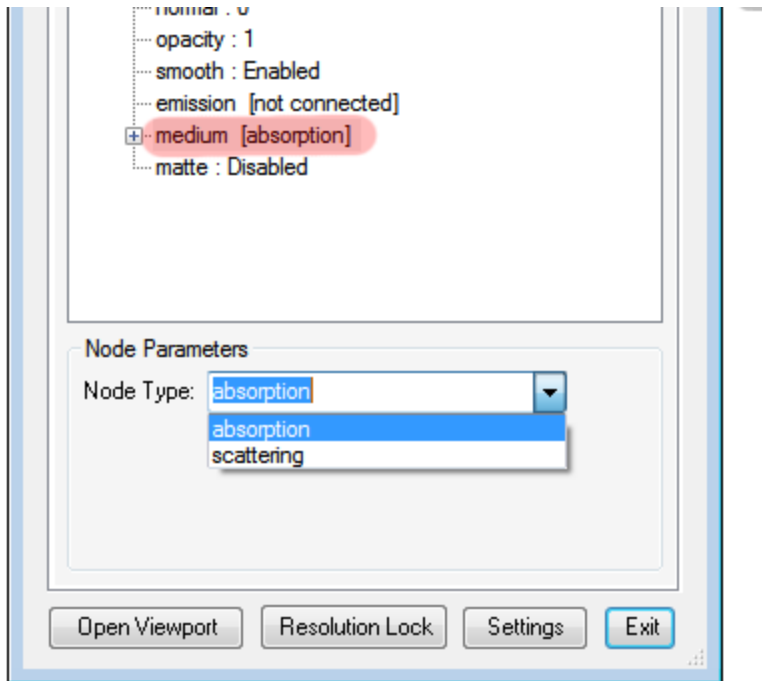
Texture Emission

You can specify any valid texture type to set the light intensity. This can be used to create neat effects such as TV screens by using an "Image (Color Image)" on page 52 as the source.



Mediums

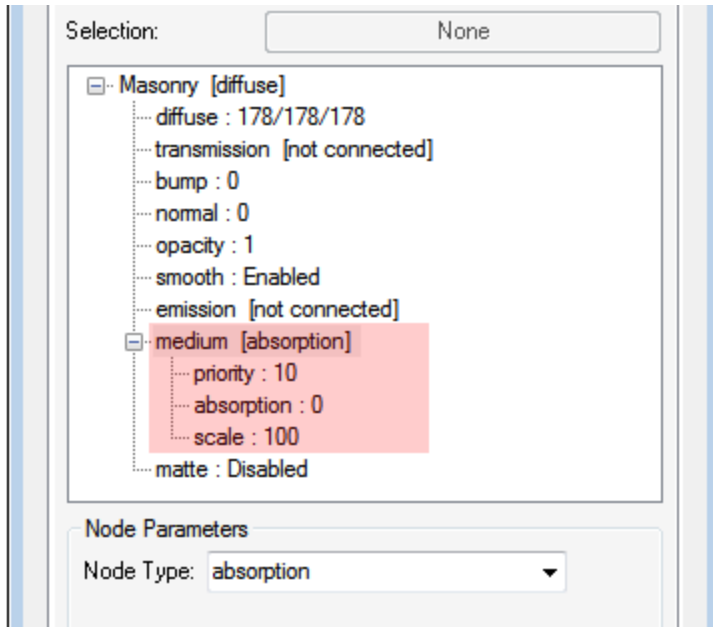
OctaneRender™ has two types of mediums: "Absorption Medium" on the next page and "Scattering Medium" on page 49.



Absorption Medium

Absorption¹ means that the material slightly absorbs light while passing through. The color resulting from this absorption is dependent on the distance light travels through the material. With increased distance it will get lighter, and if the absorption is colored it will get more desaturated. It works in a subtractive way, so you need to configure the inverted colour instead to get an absorption colour desired.

¹Defines how fast light is absorbed while passing through a medium.



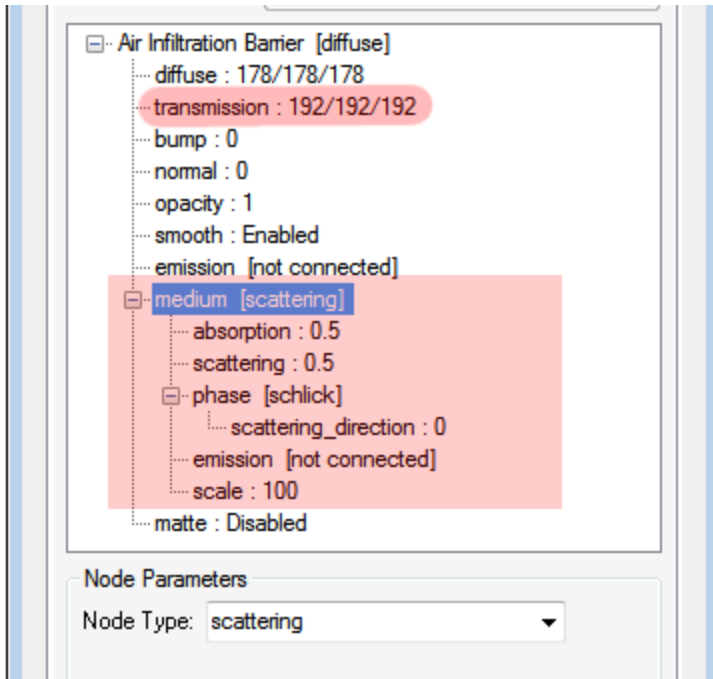
Scattering Medium

This is a medium with single-scattering SSS, and also absorption. To use this medium you need to create a volume, it will not work correctly on simple surfaces.

You can use it to create true unbiased SSS (although not multiple-scattering yet) using various parameters, including scattering texture, emission texture, and various other parameters.

Note: This is single-scattering SSS, not multiple-scattering. It's much faster than the latter, and much more practical, although it does not allow a few things such as volumetric caustics.

Important: For the "scattering" node to work, the kernel must be set to "pathtracing" or "pmc" and a node MUST be plugged into the "transmission" pin. Also, "scattering" is only available of "diffuse" and "specular" materials.



Textures

The Texture types allow for creating very flexible materials.

These are used to create patterns that can be used alone or in combination with the Mapping and Colour textures to create memory efficient, procedural textures that, in turn, can be used to create textures, bump maps, and other advanced materials with minimal impact to **GPU**¹ memory. It is therefore advantageous to explore creating materials using these textures before resorting to image based textures.

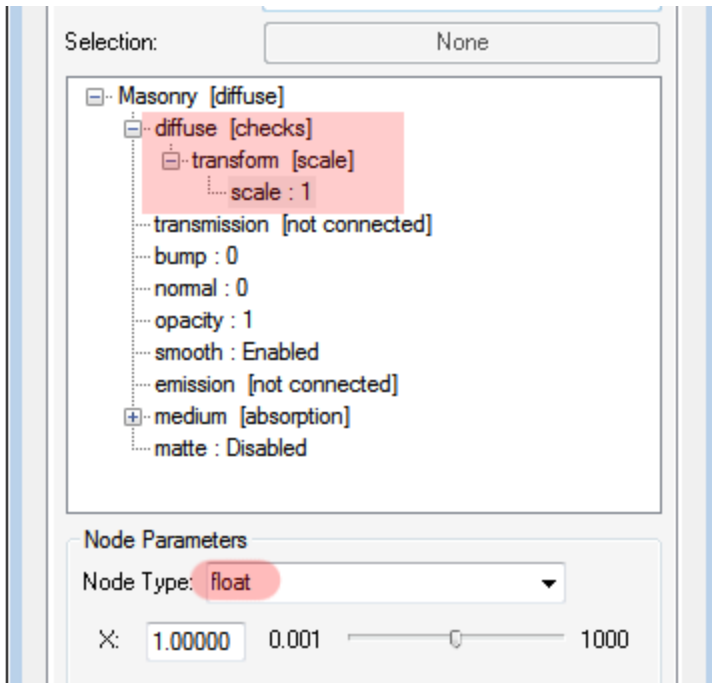
Checks Mix Texture

The Check procedural texture is useful for making stripes, checker board and grid patterns. It is controlled by a float3 value. It is most useful when mixed with other textures.

Change the "scale" pin from "float" to "float2" or "float3" to control the different dimensions of the checks pattern.

¹The GPU is responsible for displaying graphical elements on a computer display. The GPU plays a key role in the Octane rendering process as the CUDA cores are utilized during the rendering process.

Important: The Checks node does not work correctly when the geometry is at the origin of the scene (ie. 0, 0, 0) and will render artifacts in this situation.



FloatImage (Gray Scale)

The image is interpreted as gray scale even if it is a full colour image, thus saving **GPU**¹ ram. The Invert checkbox can be used to invert the image (useful for bump and opacity maps).

Note: For many of the standard Revit materials, the plugin will bring also the texturemaps for that Revit material during the material conversion process. However if you have changed the texturemaps in the Revit material, or created new Revit materials, you will need to edit the Octane material to load the appropriate texturemaps. Remember to right-click the Octane material tree and "Save as Default" once

¹The GPU is responsible for displaying graphical elements on a computer display. The GPU plays a key role in the Octane rendering process as the CUDA cores are utilized during the rendering process.

you have done this, so that the texturemaps you have loaded will be used next time that Revit material is converted.

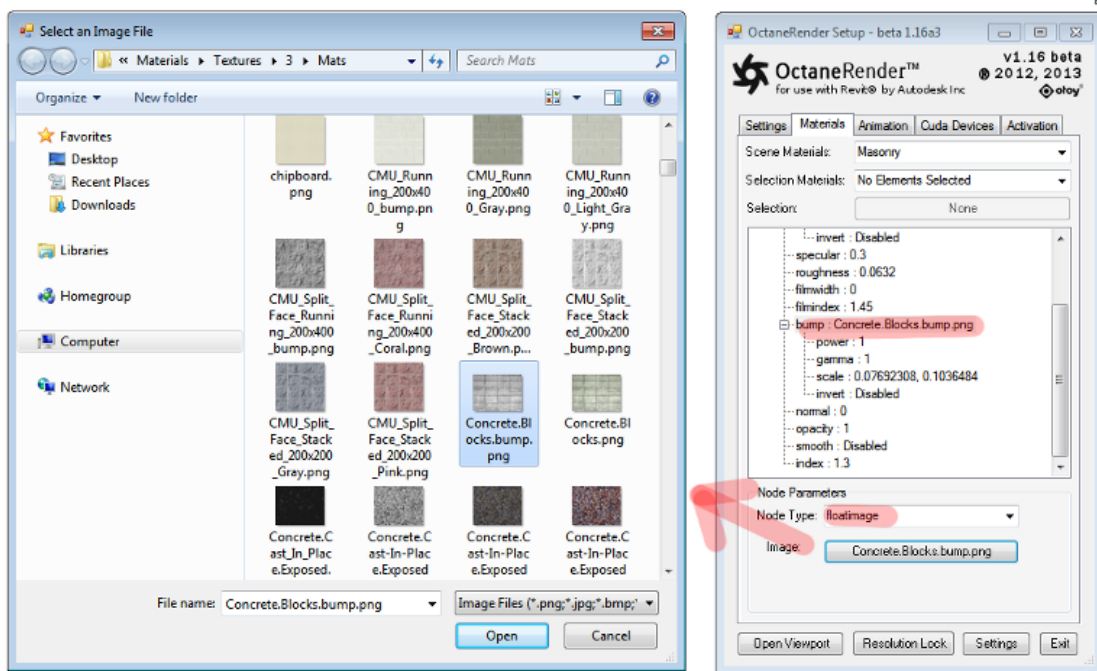


Image (Color Image)

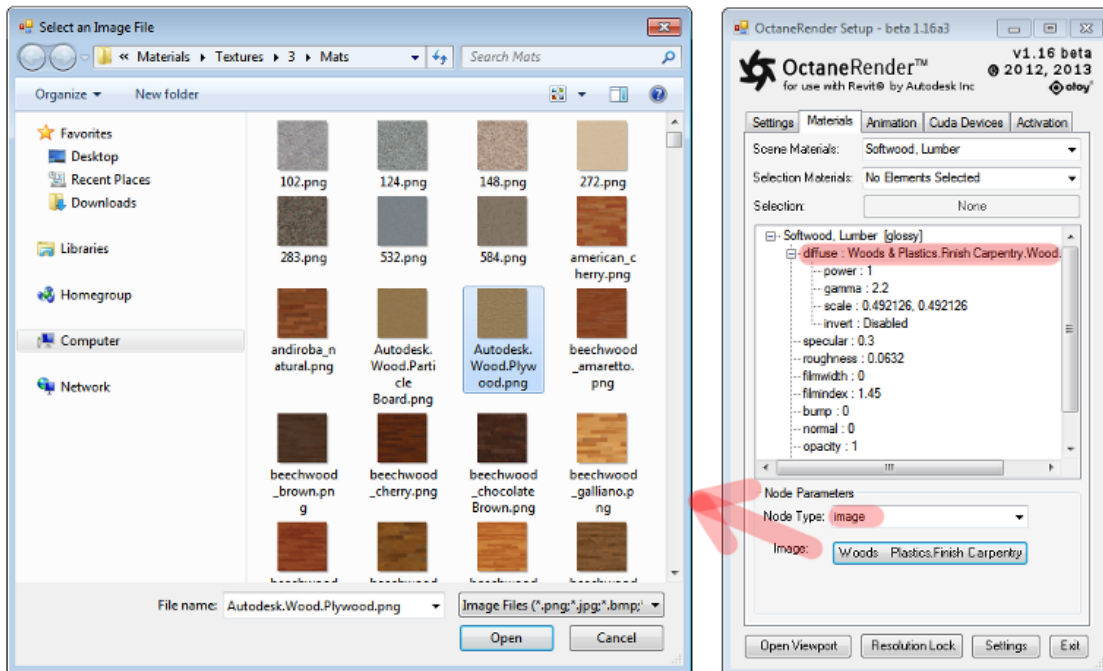
Image textures use image files to create the texture.

The image is interpreted as being full colour even if it is a grey scale image, and therefore take up more **GPU**¹ memory.

Note: For many of the standard Revit materials, the plugin will bring also the texturemaps for that Revit material during the material conversion process. However if you have changed the texturemaps in the Revit material, or created new Revit materials, you will need to edit the Octane material to load the

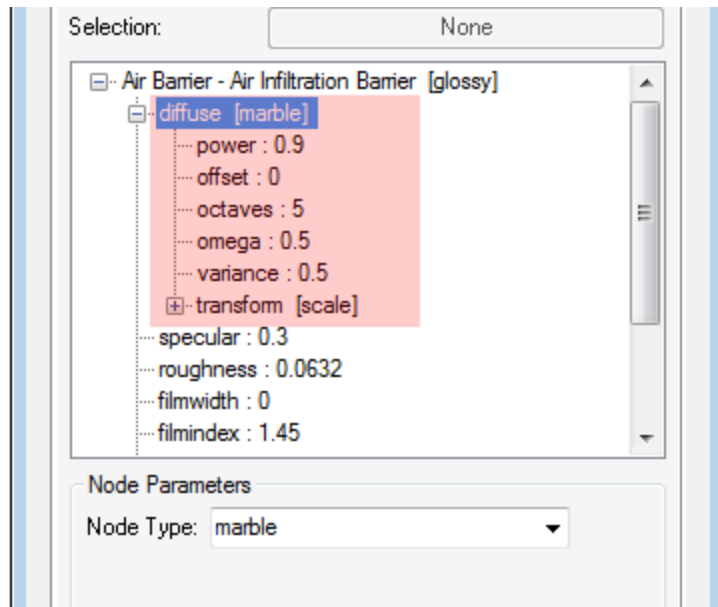
¹The GPU is responsible for displaying graphical elements on a computer display. The GPU plays a key role in the Octane rendering process as the CUDA cores are utilized during the rendering process.

appropriate texturemaps. Remember to right-click the Octane material tree and “Save as Default” once you have done this, so that the texturemaps you have loaded will be used next time that Revit material is converted.



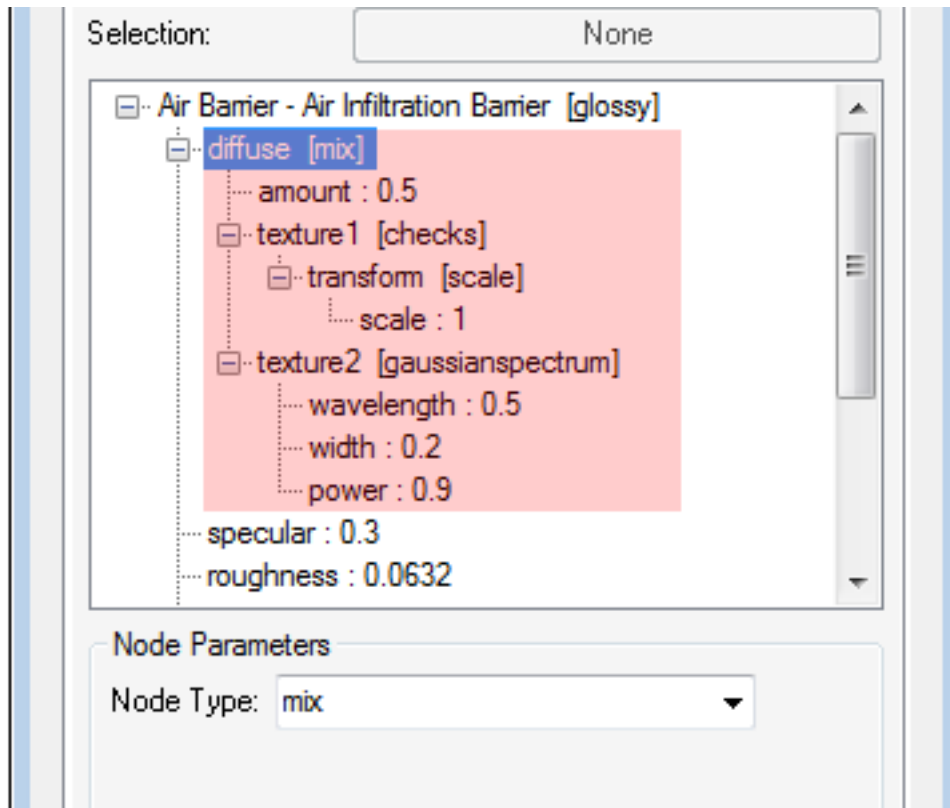
Marble Texture

The Marble texture is a procedural texture that can be used to create marble-like noise. It is similar to a turbulence texture but more fine-tuned to create marble-like patterns.



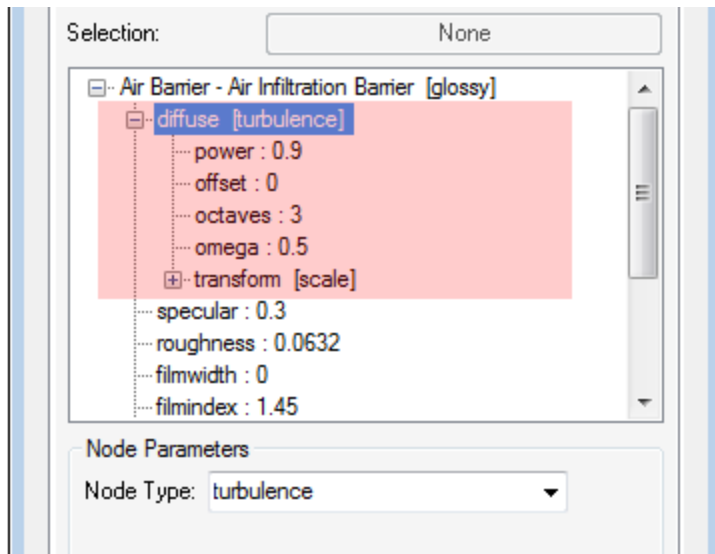
Mix Texture

The Mix textures are used for mixing two textures together, either linearly or according to a cosine wave. For example, you place a Checks Mix combined with a GaussianSpectrum.



Turbulence Texture

The Turbulence texture can be used to create many different effects based on banded noise. This flexible texture can be used to create wood, marble, flesh, and many other useful textures.

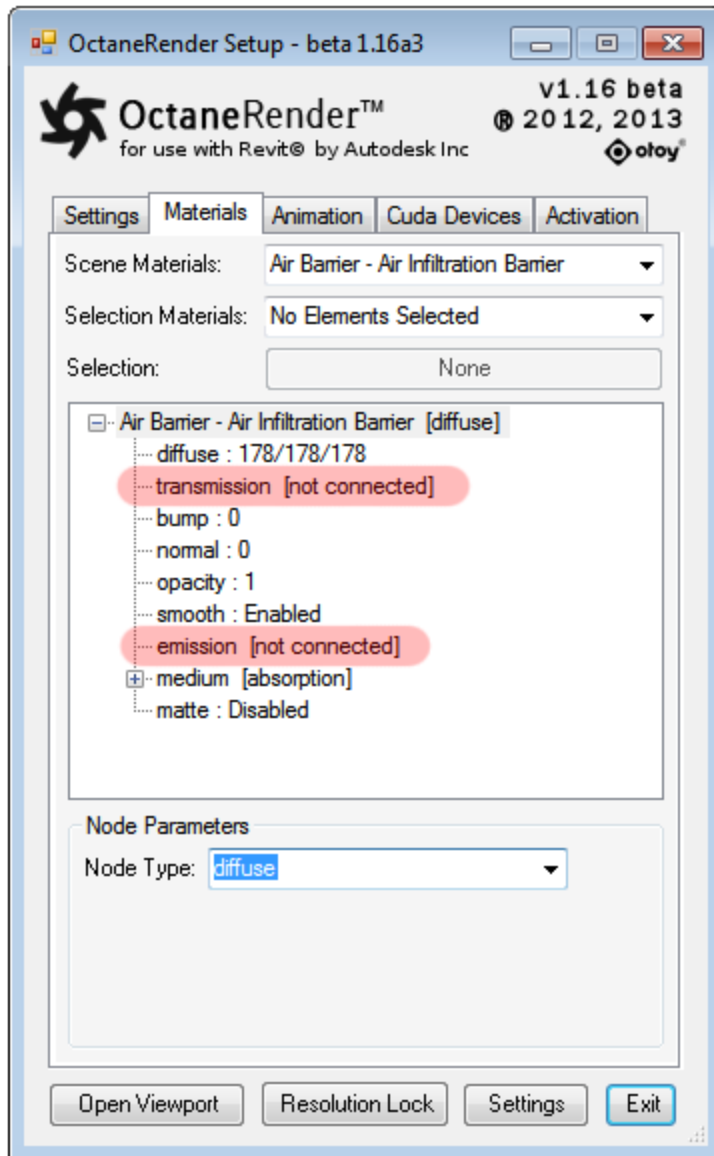


Connecting and Disconnecting Nodes

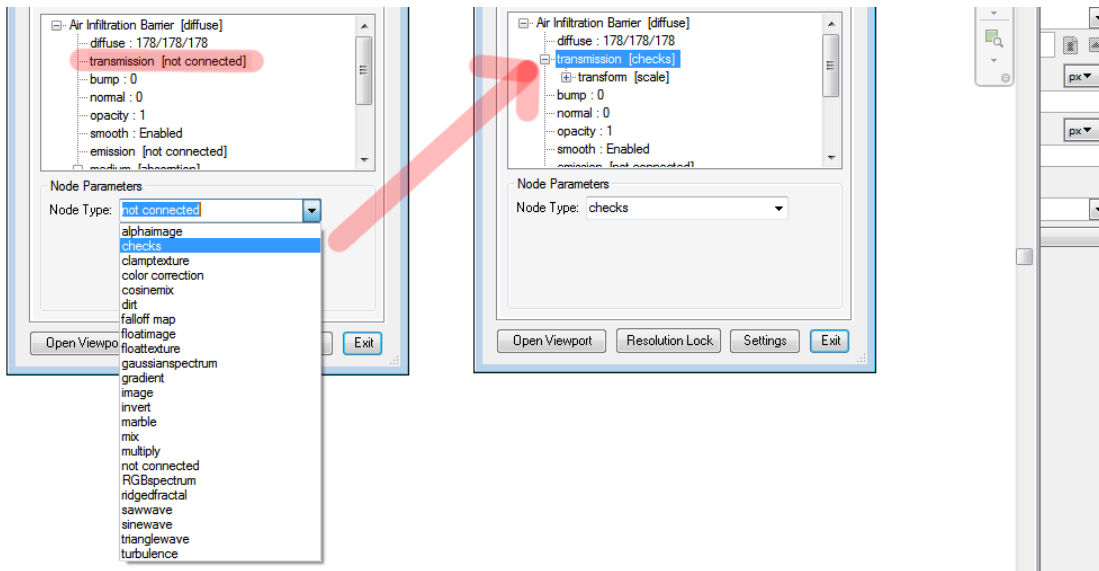
The default **Emission** and **Transmission**¹ pins of a **Diffuse material**² node will be unplugged (i.e., have no node connection).

¹A surface characteristic that determines if light may pass through a surface volume.

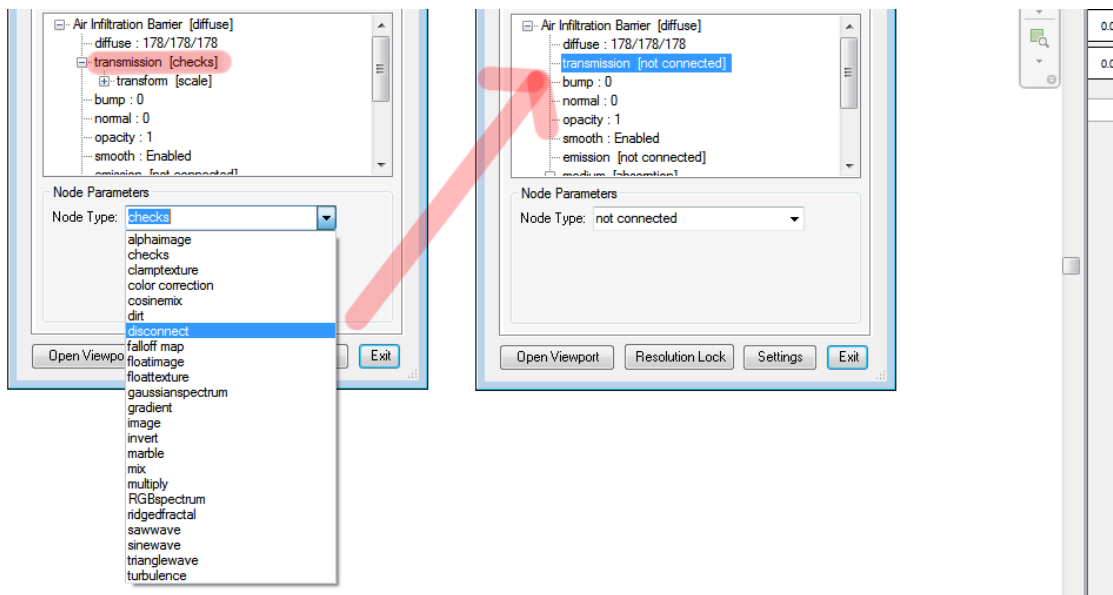
²Used for dull, non-reflecting materials or mesh emitters.



To create node connections for these pins, change the node type from “not connected” to the desired type in the **Node Type** combo box.



If you need to disconnect a node from a “transmission” or “emission” pin, select the “disconnect” note type from the **Node Type** combo box.



Favourites

The **Materials**¹ tab of the plugin contains a **Favourites** combobox. You can now save a material as a "Favourite" by right-clicking the material tree and select the **Save as Favourite** menu option and entering a Favourite material name. That material will then be available in the **Favourites** combobox, and can be quickly applied to the current material by simply selected it from that combo box.

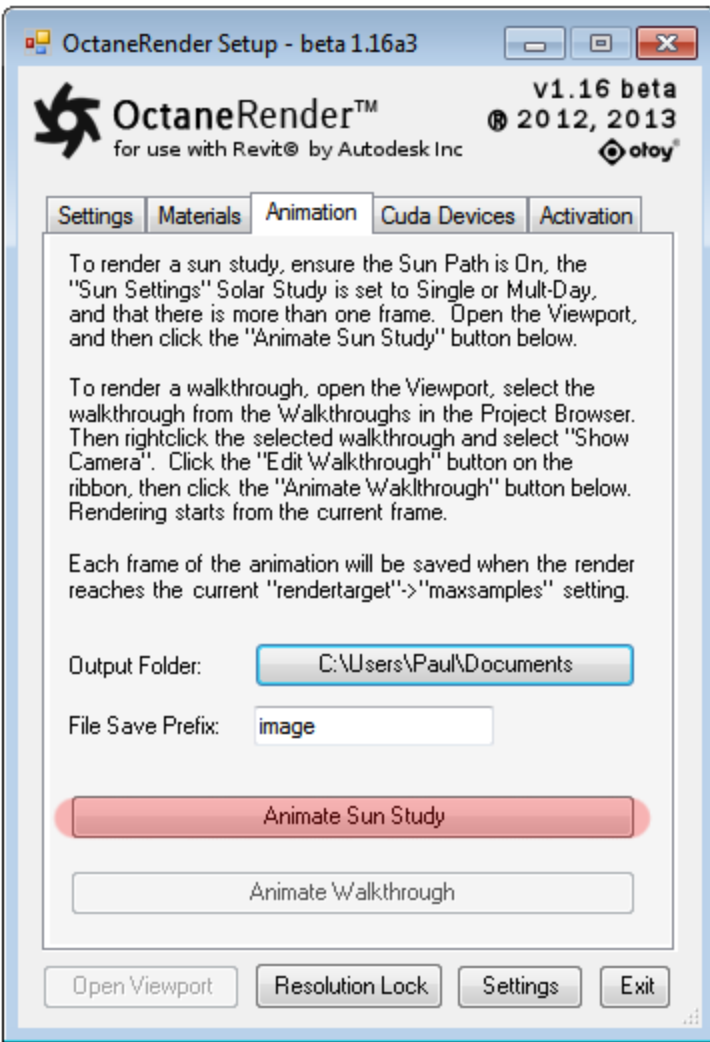
Where a Favourite (which is an xml material export file) contains image/alphaimage/floatimage files with NO FOLDER specified, the image file will be loaded from the Favourites folder (i.e., "C:\Users\[user-name]\AppData\Local\OctaneRender for Revit\Favourites"). This allow users to put together and distribute "Favourites" material libraries – where the XML and image files are stored in the Favourites folder.

Sun Studies

To render a sun study, ensure the Sun Path is On, the "Sun Settings" Solar Study is set to Single or Mult-Day, and that there is more than one frame. Open the Viewport, and then click the **Animate Sun Study** button. The animation frames will be saved to the folder specified in the "Output Folder", and the filename of each frame will be prefixed by the "prefix" text.

Each frame will finish rendering when the "kernel" – "maxsamples" samples have been reached.

¹A set of attributes or parameters that describe surface characteristics.

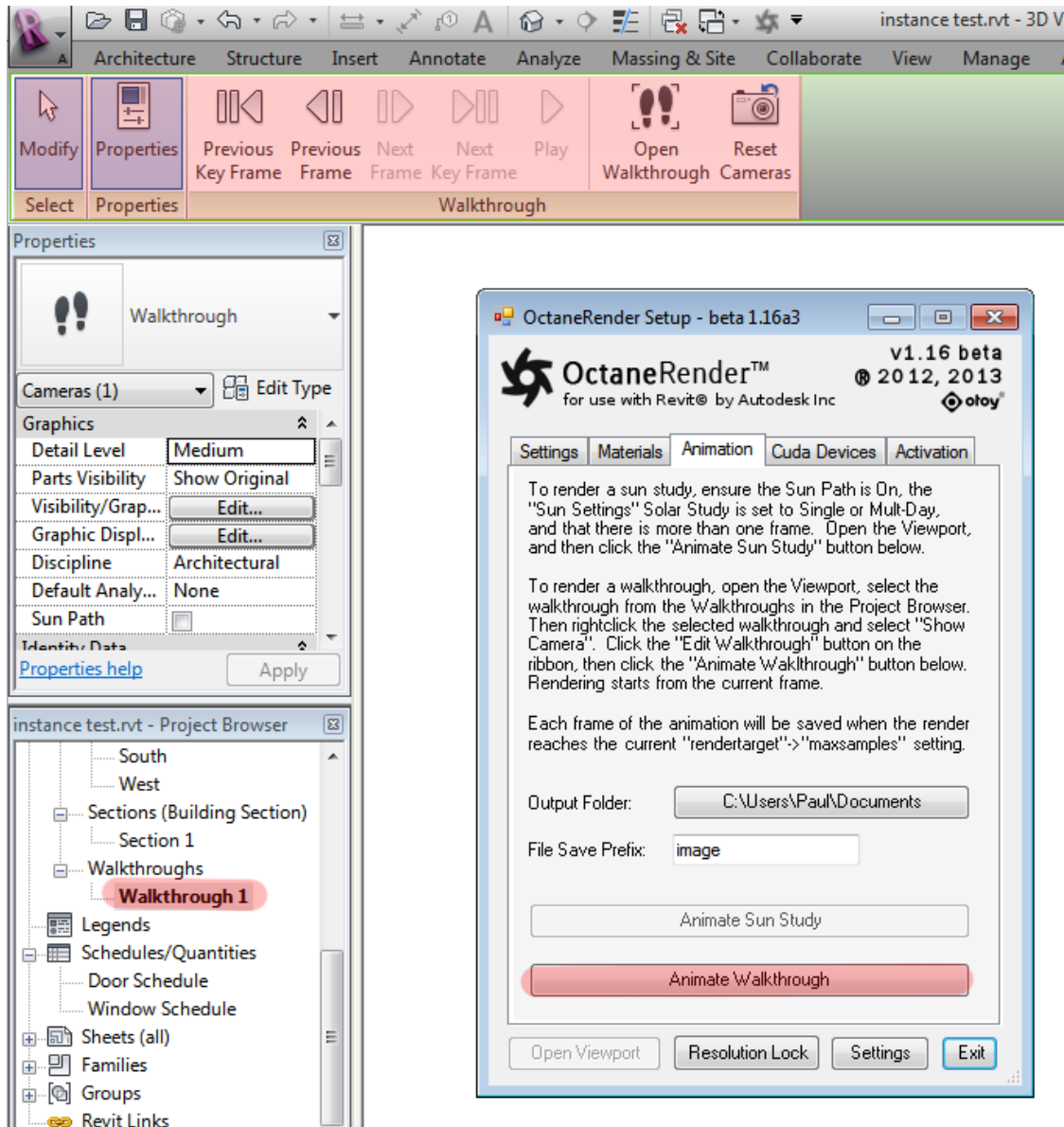


Walkthrough Animations

To render a walkthrough, open the Viewport, and then select the walkthrough from the **Project Browser**. Then right-click the selected walkthrough and select "Show Camera". Click the **Edit Walkthrough** button on the ribbon, then click the **Animate Walkthrough** button below. Rendering starts from the current frame and automatically runs through to the last frame.

Each frame will finish rendering when the "kernel" – "maxsamples" samples have been reached.

Important: Rendering and exporting walkthrough animations may not work on non-English versions of Revit – and in this case you will get an error “Unable to commence animation...”. If this occurs, start Revit using the English language code (click this [link](#) for how to do this).



Geometry Proxies and Instancing

Geometry Proxies

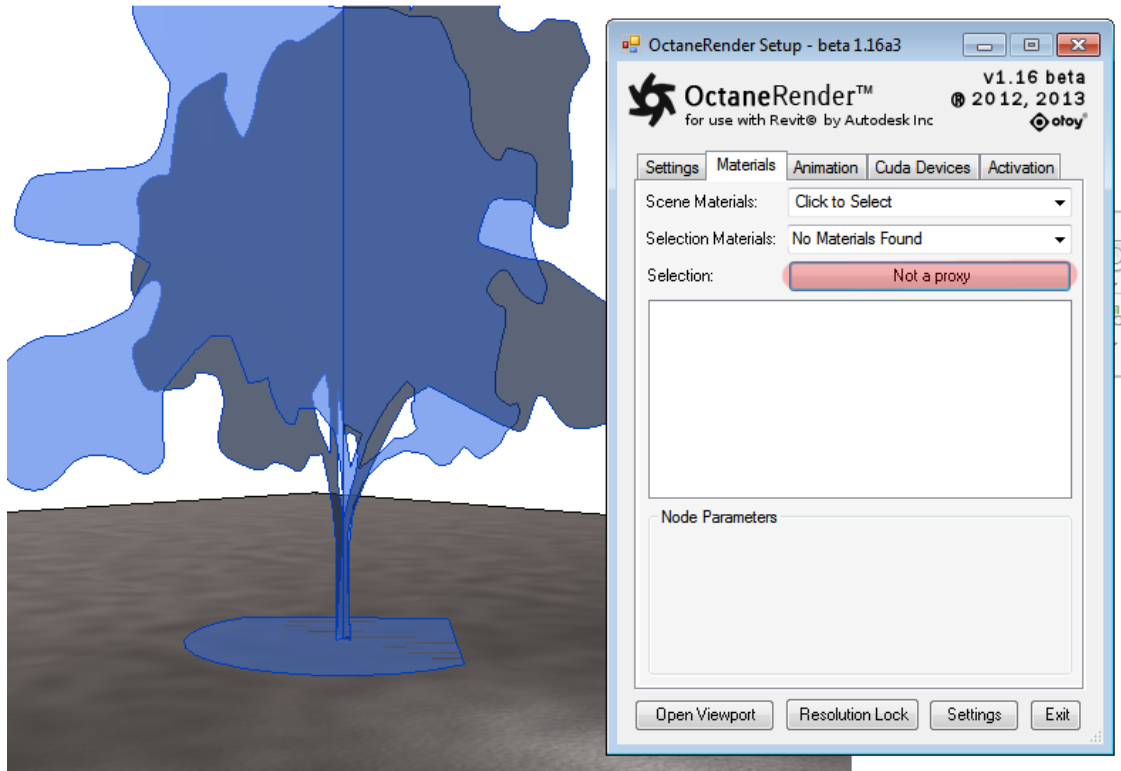
Geometry proxies are where a Revit scene element is used as a placeholder (or “host object”) for an external OBJ file. To do this, add an Revit “Object” element (generally a Component or Family Instance) to the scene – positioned where you want the OBJ file to appear. It doesn’t matter what Object you use, since it will not appear in the render.

Important: The proxy “Host” object must NOT be attached to a wall or any object which is not horizontal – since this will add an additional rotation to the proxy host object which will not be allowed for by the plugin and the proxy object will not be rendered with the correct rotation.

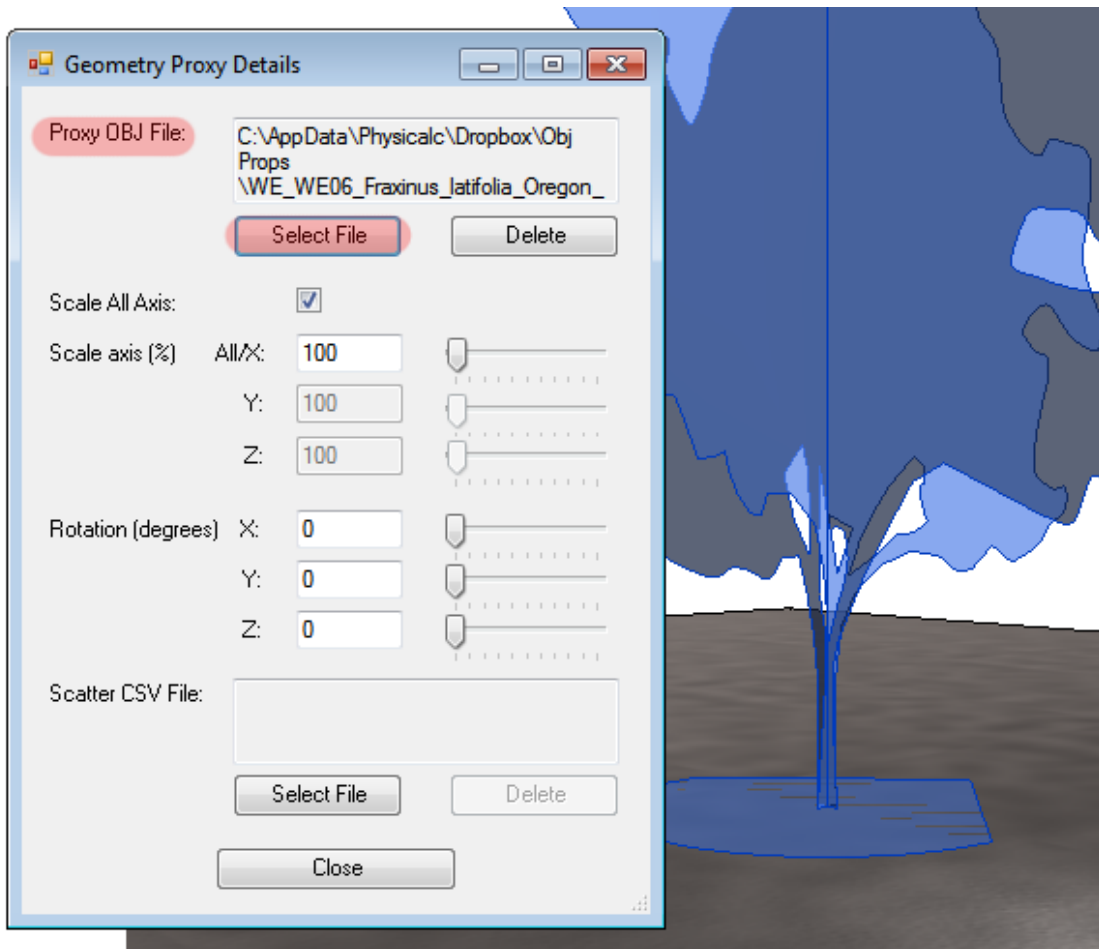


Now start the OctaneRender for Revit plugin, go to the **Materials**¹ tab, and in the Revit preview window select the Object you added.

¹A set of attributes or parameters that describe surface characteristics.



Because the tree object is not yet a proxy, the proxy button is “Not a proxy”. Click that button to setup the proxy information.

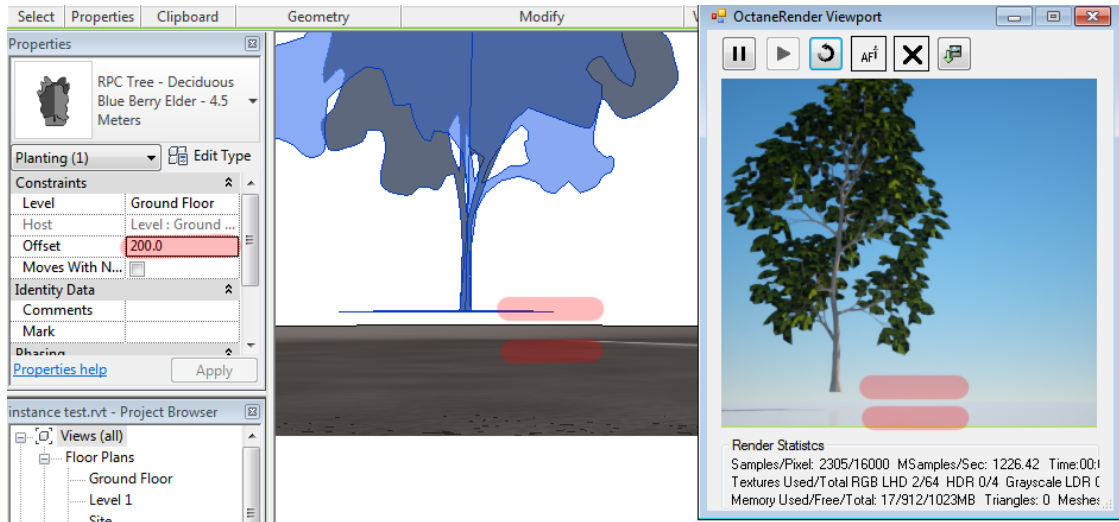


Now you can open the Viewport to see the result. You will most likely need to scale and rotation the OBJ file to get the result you are looking for, as has been done below. As you adjust sliders in the **Geometry Proxy¹ Details** screen, the Viewport is immediately updated.

Some OBJ files will not be setup for the Octane XYZ axis system, so will need to be rotated in order to get them upright. For example, the Xfrog OBJ files will need to be rotated X 270 degrees in order to have them upright. **Xfrog (and potentially other) OBJ files also contain non-standard material specifications for transparency maps. Edit the MTL file and change any lines with "map_Kd to "map_d".**

¹An object saved as a separate file with the purpose of being reused in larger scenes. This is used to minimize any addition to the total polygon count in the scene, especially if the scene requires the same object to appear several times. If used in conjunction with instancing, Proxies help keep very large scenes from reaching polygon limits and also keeps the relative file size of the main project file manageable.

If you need to adjust the height of the based of the geometry proxy, simply adjust the “Offset” in the Revit properties of the Revit host object. For example, the Revit tree has been raised 200 units in the image below, and the proxy object in the Octane Viewport has been raised the same amount (remember to click the Refresh button on the plugin Setup window if you have the Viewport open when you do this).



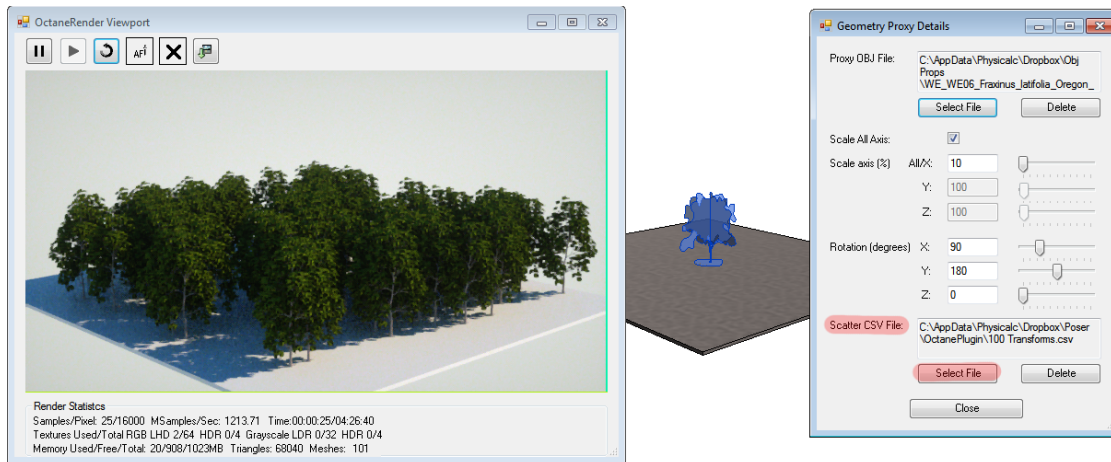
Instancing¹

Any geometry proxy OBJ file can be instanced via the Octane “scatter” node. The setup of this is handled automatically – you simply need to specify a transform CSV file. The tranform CSV file will appear as follows (refer to the Otoy forums for more details of how to create these transform files):

```
-0.62431361,0.030042023,-0.7055535,-8.0608892,0.466425251415,0.450927870912,-
0.315290481408,0.0587645647066,0.626642021525,-0.305702727477,-0.541656398413,6.11109206252
-0.43438864,0.29489794,-0.87598035,4.6149906,0.136319291528,1.37187639156,0.166443532267,-
0.188988202778,0.890350115699,-0.0661701051815,-0.452833197394,1.21890752159
-0.48941698,0.8175662,0.66365019,-4.5686788,-0.0575978148745,1.06715131321,-0.671893700617,-
0.20106620412,-0.870145899492,-0.530481590811,-0.328803968126,-0.368719910853
-0.69556693,-0.25259736,-0.57225774,6.1048522,-0.443066979564,0.519450844134,-0.129596876879,-
0.0438018755731,0.565578535567,0.0962841284689,-0.808136867406,-7.09126028028
```

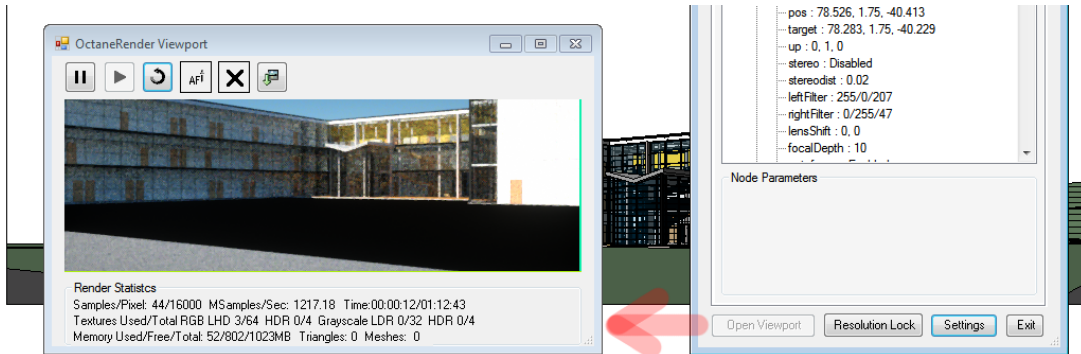
¹Instancing an object means taking a single imported mesh object, such as an OBJ or an FBX and making multiple copies, each of which can be placed in different parts of the scene. This saves an enormous amount of computational resources because only a single object is loaded into the scene.

Each line of the transform contains 12 numbers, representing a the first 3 rows of a 4×4 transformation matrix.
The following image shows 1000 instances of the tree OBJ file that is the proxy of the Revit tree Object.



OctaneRender™ Viewport

To display the OctaneRender™ Viewport, click the **Open Viewport** button in the main plugin Setup window. This will open a new window, load the scene geometry into Octane, and start rendering the scene in the Viewport.

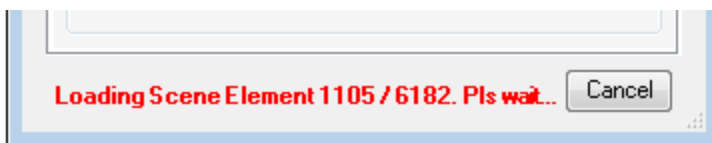


The speed with which the scene geometry load into Octane is dependent on two factors:

1. The amount of geometry in the scene, and
2. The amount of UV mapping the plugin needs to do for curved surfaces

Scene loading will be fastest when **Triangulation Level of Detail** is set to 0 in the **Settings**, and slowest when it is set to 1. When Triangulation Level of Detail is set to 0, the smoothness of curved surfaces and quality of UV mapping will be low quality, whilst at 1 these will be at the highest quality.

Whilst the scene is loading, you can click the **Cancel** button to abort loading.



Whilst rendering the scene in the Viewport, you can move the Revit camera around, and this will be immediately reflected in the Viewport.

The Viewport contains the following buttons at the top of the window:

Pause

Pauses the render.

Continue

Continues the render (after it has been paused).

Refresh

Reloads all scene geometry and materials from Revit to OctaneRender. This is used after changing elements in the Revit scene.

Focus Pick (AF)

Click the toggle button to enable the setting of the Octane camera focal depth by clicking on an item or elements in the Viewport.

Lock Scene (X button)

Clicking this toggle button will mean that NO changes to the scene, camera position or Octane node setup will propagate to the Viewport (means the render will continue whilst you work on the underlying scene). NOTE. Imager and Postprocessing settings changes will not be applied whilst the Lock Scene button is ON.

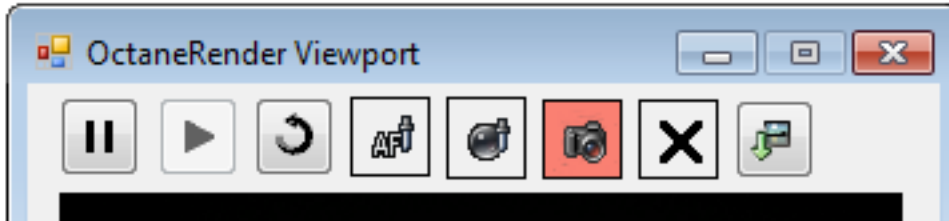
Save

Saves the current render in the Viewport to file. The file type is determined by the Image Save Format in the Configuration screen.

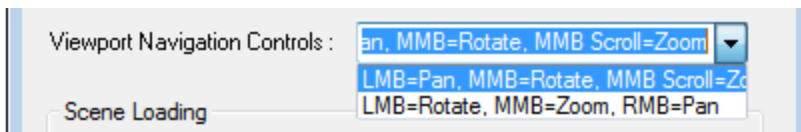
The Viewport contains a range of render metrics at the bottom of the window, including render time (elapsed and estimated), memory usage and texturemap usage.

Viewport Navigation

Clicking the "Viewport Navigation" button will put the plugin in a mode where the Revit camera is no longer used to position the Octane camera. Instead, navigation via the mouse buttons in the viewport.



The mouse controls are set in the Configuration.



In both navigation system above, scrolling the mouse wheel with Zoom.

If you select an object in the Revit scene, that object will be the center of rotation. Otherwise the scene position 0, 0, 0 will be used as the center of rotation. The "camera" "up" vector in Octane is also set to 0, 1, 0 when you enter Viewport Navigation mode to remove any Revit camera tilt.

Once the Viewport is in Viewport Navigation mode, you can save the rendertarget to the view to retain the current (Octane) camera position.

Decals

The Revit API does not provide a way to extract all the details of a Revit decal, so if you wish to render decals in Octane, simply replace the decal in Revit with some geometry and apply the decal texturemap to that geometries material.

For example:

- Select Floor Plan -> Ground Floor (or any other level)
- Create Wall
- Structure -> Set (work plane) -> Pick a Plane -> Select the wall -> pick an elevation
- Structure -> Component -> Model-In_place -> Generic Models
- Extrusion -> draw the decal shape -> Finish Edit Mode

Important: In the properties box, assign a material that will convert to an Octane material that will have the decal texturemap loaded.

- Finish Model

When you run the Octane plugin, select the extrusion created above, and setup it's material in the **Materials**¹ tab. The diffuse map scale should be changed from "float2" to "float", and set the scale (to about 0.02).

¹A set of attributes or parameters that describe surface characteristics.

Linked Revit Models

If the plugin configuration option “Load Linked Files” is ticked, any Linked Revit Models in the scene will also be loaded into the Octane Viewport scene. However the materials from the linked files will NOT be imported – instead they are re-converted from the current Revit scene material, or loaded from the Octane material Default.

To edit a Linked Revit Model Octane material, select the linked model in the Revit preview scene, and then select the material from the plugin **Material**¹ tab **Selection Materials**² combo box. Any modified Octane materials for linked model materials as saved in the current Revit .rvt file (and not the linked .rvt file).

Important: Do not edit the materials for a Linked Revit Model by selecting the materials from the Scene Materials combo box, because Revit will have assigned a different unique identifier to that material than the “real” material obtainable by selecting the linked model and then selecting the material from the Selection Materials combo box.

You can also select materials from Linked Revit Models by opening the OctaneRender Viewport and using the material picker.

Important Limitation: Elements from a Linked file CANNOT be used as a proxy host due to limitations withing the Revit API.

¹The representation of the surface or volume properties of an object.

²A set of attributes or parameters that describe surface characteristics.

Moving Octane .rvt File Assets to Another PC

When you move a .rvt file to another PC (ie; from your work PC to your home PC), you will need to also copy the Octane assets. These assets are moved as follows:

- Revit scene file – doesn't matter when it is copied to on your home PC
- Revit texturemaps – these should be in the same folder on your home PC as at work (ie. C:\Program Files (x86)\Common Files\Autodesk Shared\Materials¹\Textures²)
- LiveDb texturemaps – these will be in the folder specified in your plugin configuration – so set this to the same folder on both PC's and copy the files across
- OCS/ORBX³ Proxies – these need to be on the same folders on both PC's. So suggest storing them in c:\ProgramData\OctaneRender\ForRevit\myProjectName, so that whole folder structure can be copied/sync'd between PC's
- Other Texturemaps and Proxies – these need to be on the same folders on both PC's. So suggest storing them in c:\ProgramData\OctaneRender\ForRevit\myProjectName, so that whole folder structure can be copied/sync'd between PC's

¹A set of attributes or parameters that describe surface characteristics.

²Textures are used to add details to a surface. Textures can be procedural or imported raster files.

³The ORBX file format is the best way to transfer scene files from 3D Authoring software programs that use the Octane Plug-in such as Octane for Maya, Octane for Cinema 4D, or OctaneRender Standalone. This format is more efficient than FBX when working with Octane specific data as it provides a flexible, application independent format. ORBX is a container format that includes all animation data, models, textures etc. that is needed to transfer an Octane scene from one application to another.

Octane 2.0 Features

Displacement¹ Mapping

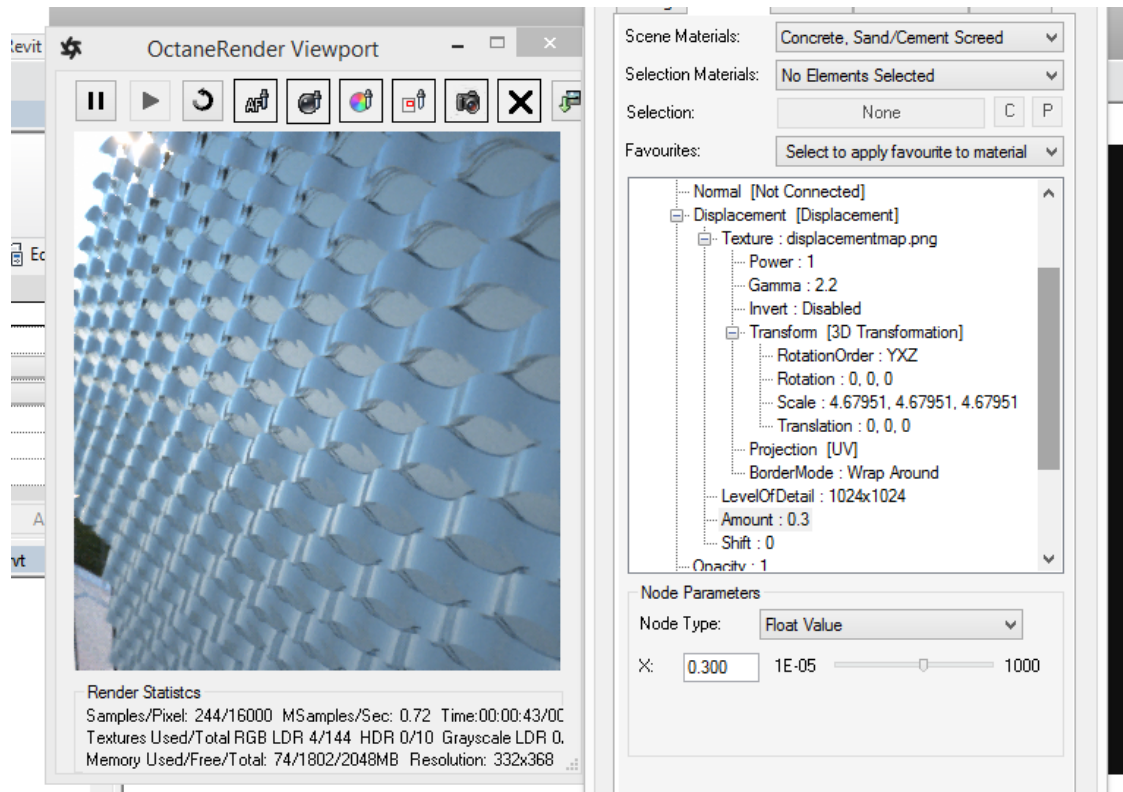
This is a new pin on each Octane **Material**² type. Change the Displacement pin type to Displacement and assign a Grayscale Image node to the Texture pin and load the displacement map. Use caution when setting thing displacement amount – since high amounts may cause a video card error. It is highly recommended that you use 16 bit displacement maps (since 8 bit maps do not provide the granularity required for high quality renders).

Displacement mapping requires UV Projection surfaces.

Note: You may need to adjust the Kernel->Ray Epsilon to ensure there is no self-shadowing from displacement geometry.

¹The process of utilizing a 2D texture map to generate 3D surface relief. As opposed to bump and normal mapping, Displacement mapping does not only provide the illusion of depth but it effectively displaces the actual geometric position of points over the textured surface.

²The representation of the surface or volume properties of an object.

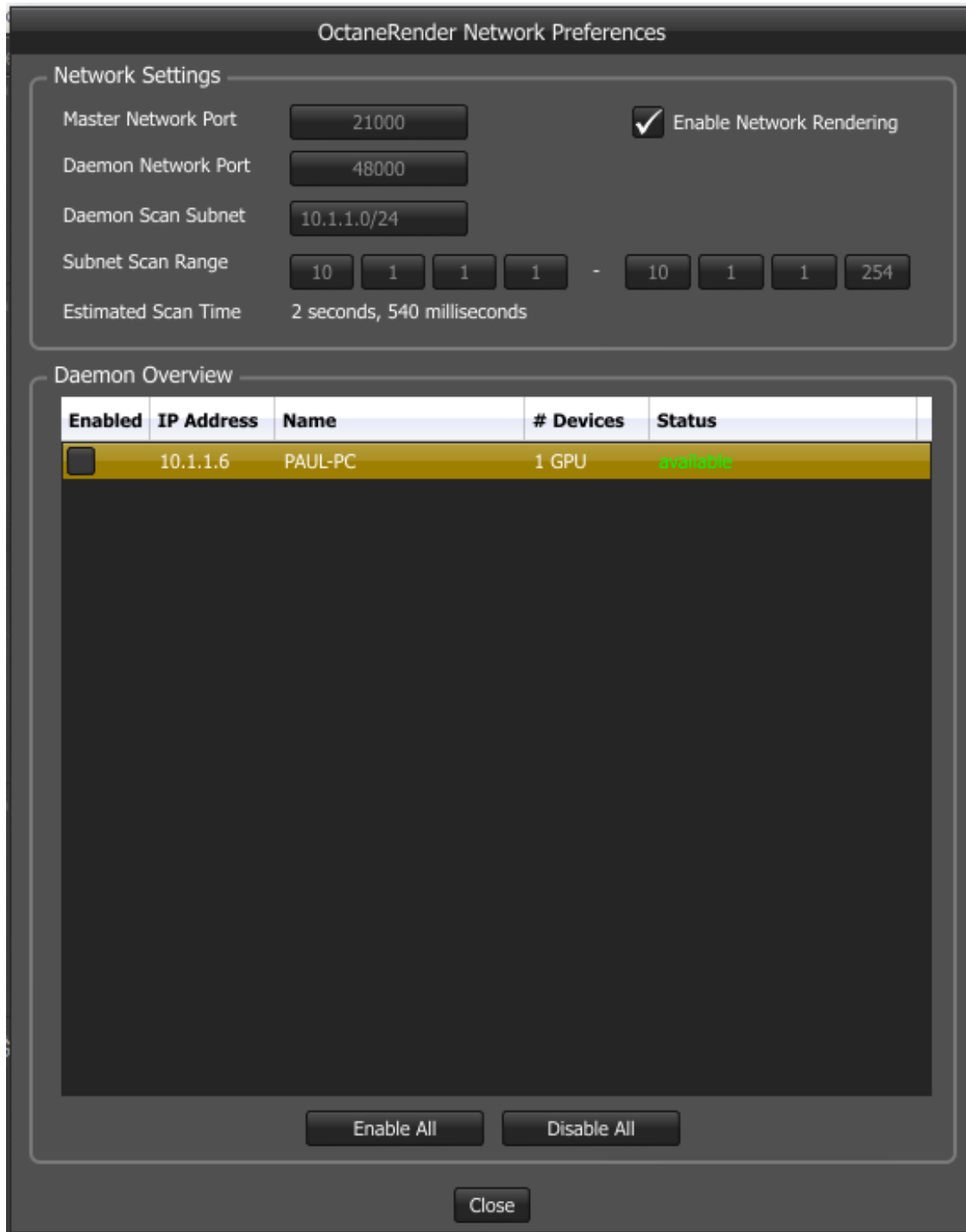


Network Rendering¹

Fully supported, and available from the Device tab of the plugin (Network Rendering button). Setup the Slave PC as per the Octane Standalone instructions, the activate in the Network Render window. To do this, untick **Enable Network Rendering**, select the appropriate Daemon Scan Subnet (may only be one option), tick **Enable Network Rendering**, then tick the Slave PC which is found on the network that you want to use. Subsequent rendering in the plugin will use that slave PC.

Important: The Octane version for the Slave must be the same version as the plugin you are using (i.e., if you are using version 2.0.10.x of the plugin, you must run the slave for Octane 2.0.10).

¹The utilization of multiple CPUs or GPUs over a network to complete the rendering process.

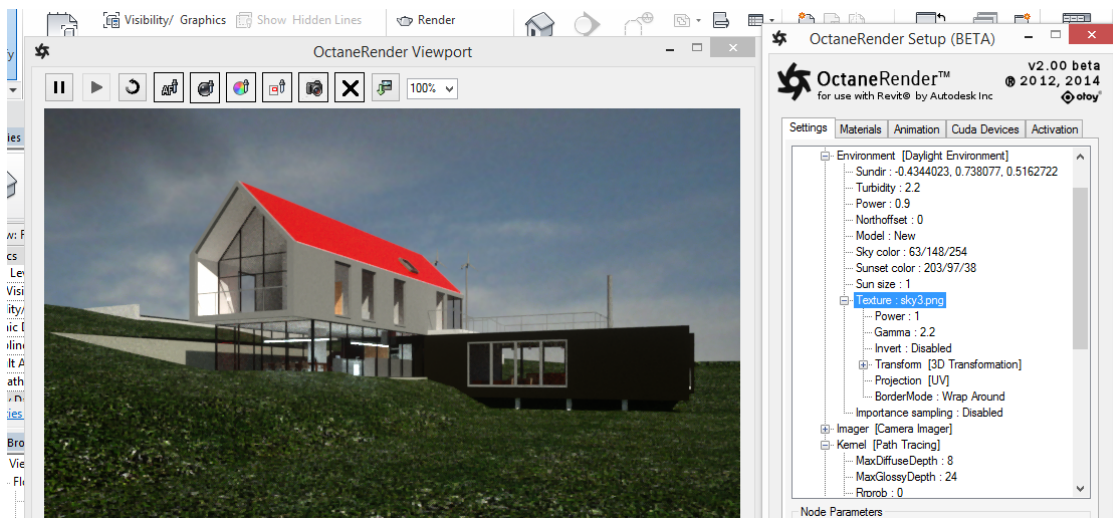


Random Color Texture

This is a new node type which provides a random number between 0 and 1 for each “scatter” instance. For best effect, plug it into the “amount” of a material mix of a material for a proxy OBJ which has a scatter .csv file. This node needs to be used on a material for geometry which is an Octane **Proxy**¹ object which as a scatter .csv file defined.

HDRI² & Sun

This is supported through the **Octane Daylight Environment** node. Connect an IBL texturemap to the **Texture** pin to enable this option.



Ambient Occlusion

This is a new render type in the Info Channel Kernel. If using this, enable the **AlphaChannel** pin.

Normal Space Position Type

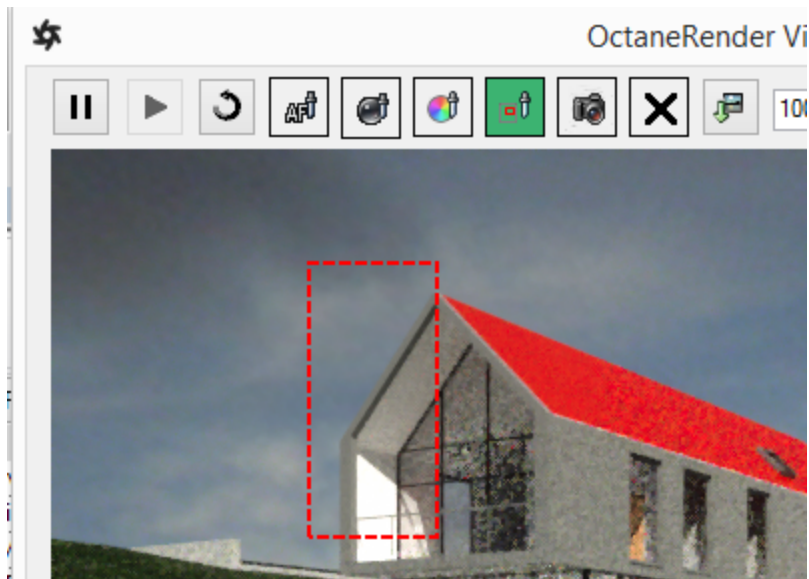
¹An object saved as a separate file with the purpose of being reused in larger scenes. This is used to minimize any addition to the total polygon count in the scene, especially if the scene requires the same object to appear several times. If used in conjunction with instancing, Proxies help keep very large scenes from reaching polygon limits and also keeps the relative file size of the main project file manageable.

²An image which presents more than 8 bit per color channel unlike most common image formats.

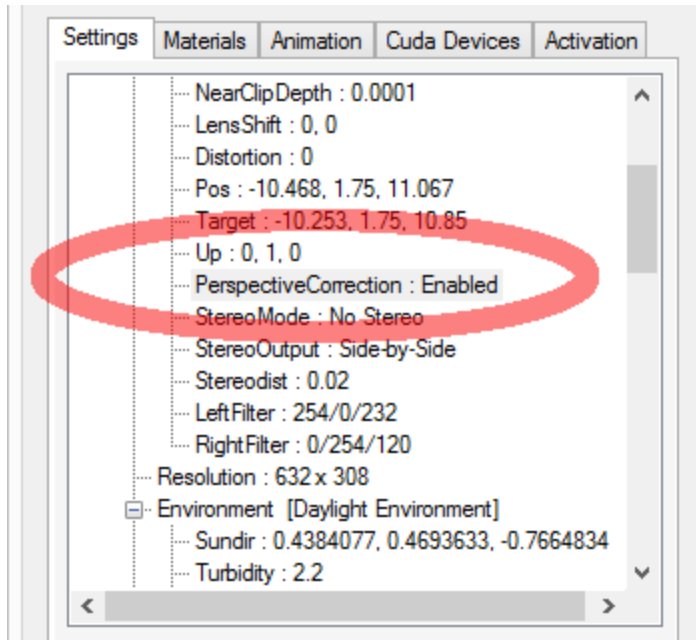
This is a new Position Type that is used for **IES**¹ lighting – which when used, directs the IES light in the direction of the normal of the emitter geometry. For best results with IES lights, use a Spherical Projection, and set the Position Type to Normal Space.

Render Region

Enable the selection (via mouse dragging in the Viewport) of a render region by clicking the **Render Region** button. All other pick functions (focus, material, white balance) are disabled whilst Render Region is enabled.



¹An IES light is the lighting information representing the real-world lighting values for specific light fixtures. For more information, visit <http://www.ies.org/lighting/>.



Edge Rounding

Not currently supported, because Revit does not provided welded vertices on geometry items.

Strand Hair

Not currently supported, because Revit does not support vertex strand geometry items.

Subdivision

Not currently supported, because Revit does not provided welded vertices on geometry items.

Object Motion Blur¹

Not currently supported, because Revit does not have an object animation system.

Enabling this camera option renders vertical lines parallel. This requires the Octane Camera Up Vector to be directly "up", so you will need to manually override the Camera "Up" pin to be 0, 1, 0. Moving the Revit camera will reset the Up vector to match the Inventor Viewport.

¹An optical phenomenon that occurs when a camera's shutter opens and closes too slowly to capture movement without recording a blurring of the subject.

Octane 2.1 Features

Render Passes¹

A new node has been added to the Rendertarget for Render Passes. By default, all passes are off, but you can enable individual passes, and when the Viewport is open, those enabled passes can be viewed via the Render Passes drop-down box in the Viewport.

The render statistics show the samples/pixel for the current render pass.

The two important pins in the Render Passes node are:

- **Roughness Threshold:** To distinguish between specular and glossy materials. **Materials**² with roughness < threshold are considered specular, material with roughness > threshold are considered glossy.
- **Minimum Info Start Samples:** The minimum amount of samples we need to have rendered for the beauty passes before we're allowed to start rendering the info passes. 0 means that we wait until all the beauty passes are finished. In order to force Info render passes to be immediately available, set this value to 1.

¹Render passes allow a rendered frame to be further broken down beyond the capabilities of Render Layers. Render Passes vary among render engines but typically they allow an image to be separated into its fundamental visual components such as diffuse, ambient, specular, etc..

²A set of attributes or parameters that describe surface characteristics.

Octane 3 Features

Octane 2 license holders will be able to use the Octane 3 version of the plugin at no cost whilst Octane 3 is in the alpha and beta test stage.

Note: This will be an on-going list as new Octane 3 features are released by Otoy.

Minor Changes

- Removed "Ambient" and "Sample Environment" GI Modes from the Direct Light kernel
- Added new **Render Passes**¹ (see the Render Passes pins for details)
- Removed a number of Render Passes pins, such as Tonemapping.
-

Environment Mediums²

Added Medium and Medium Radius pins have been added to the to the Daylight and Texture Environment settings to allow you to create scatter effects in the environment. Try setting the Medium Radius to approx 20 in order to ray sun rays.

Baking Camera

Set the Settings tab Camera node type to "Baking Camera". The baked texturemap will be for all mesh items in the Baking Camera->Baking Group ID. All geometry in the scene will have the same baking group ID (1), so you will need to only render the geometry you want to bake texturemaps for if using the Baking Camera.

¹Render passes allow a rendered frame to be further broken down beyond the capabilities of Render Layers. Render Passes vary among render engines but typically they allow an image to be separated into its fundamental visual components such as diffuse, ambient, specular, etc..

²The behavior of light inside a surface volume described by scatter, absorption, and transmission characteristics.

OpenVDB¹ Support

Add a Volume geometry item (and load a **.VDB**² file) into an **ORBX**³ proxy in order to render OpenVDB files.

Deep Image⁴ Rendering

Deep Image settings have been added to the kernel settings.

¹Dreamworks' open-source C++ library housing the data structures and tools implementation for storing and manipulating volume data, like smoke and other amorphous materials. The purpose of OpenVDB is mostly to have an efficient way to store volumetric data in memory and on disk. It has evolved into a more general toolkit that also lets you accomplish other things, such as fracturing volumes, converting meshes to volumes and vice versa. However, it does not include a computational fluid dynamics solver, and therefore it cannot procedurally generate smoke or fire. OpenVDB is fully integrated as a library in OctaneRender. For more information about OpenVDB, check at <http://www.openvdb.org/>.

²Dreamworks' open-source C++ library housing the data structures and tools implementation for storing and manipulating volume data, like smoke and other amorphous materials. The purpose of OpenVDB is mostly to have an efficient way to store volumetric data in memory and on disk. It has evolved into a more general toolkit that also lets you accomplish other things, such as fracturing volumes, converting meshes to volumes and vice versa. However, it does not include a computational fluid dynamics solver, and therefore it cannot procedurally generate smoke or fire. OpenVDB is fully integrated as a library in OctaneRender. For more information about OpenVDB, please see <http://www.openvdb.org/>.

³The ORBX file format is the best way to transfer scene files from 3D Authoring software programs that use the Octane Plug-in such as Octane for Maya, Octane for Cinema 4D, or OctaneRender Standalone. This format is more efficient than FBX when working with Octane specific data as it provides a flexible, application independent format. ORBX is a container format that includes all animation data, models, textures etc. that is needed to transfer an Octane scene from one application to another.

⁴Renders frames with multiple depth samples in addition to typical color and opacity channels.

OctaneRender® 4 Features

License Upgrade

Unless you have a subscription license, you need to upgrade your version 3 licenses to version 4. This upgrade is free, and can be done in four steps:

1. Go to <https://home.otoy.com/render/octane-render/purchase/>.
2. Click on **Upgrade** in the top menu.
3. Click on **Upgrade Now**, which is next to **Upgrade Existing Licenses To OctaneRender 4**.
4. Select the licenses you want to upgrade and confirm.

Out-Of-Core Geometry Support

This OctaneRender® 4 feature is supported via the Out Of Core settings on the CUDA® **Devices** tab.

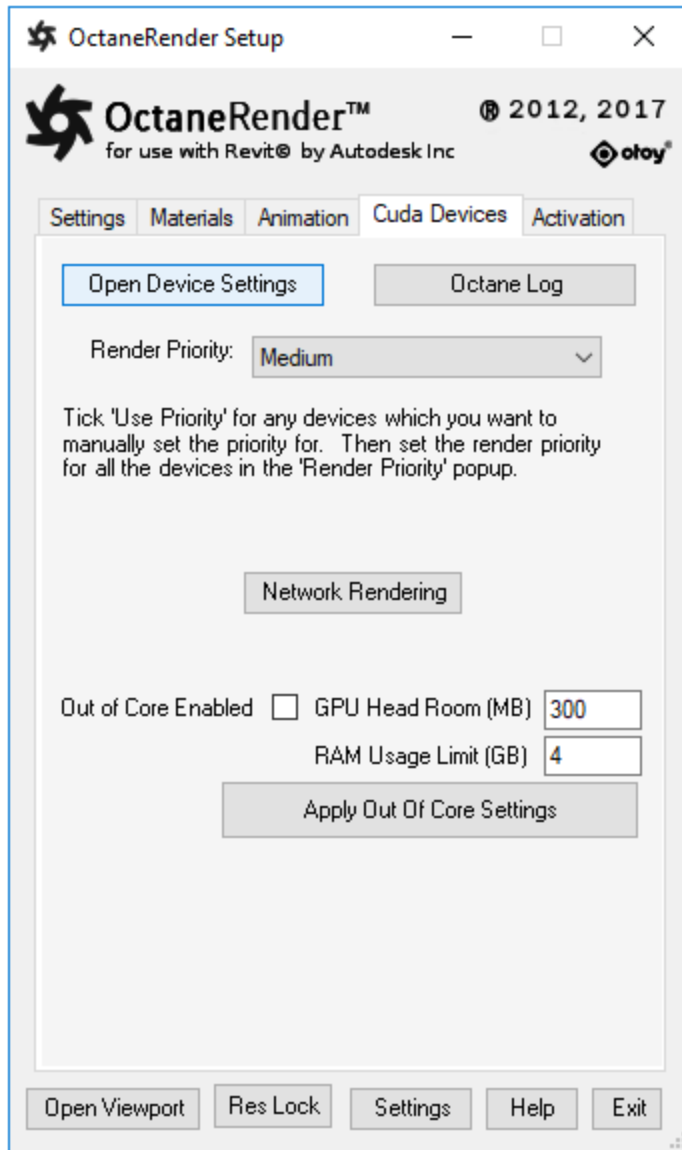


Figure 1: CUDA® Devices tab

The Devices tab moved the individual graphics card control to the **Open Device Settings** button.

AI Denoiser

You can access the OctaneRender® 4 Spectral and Volumetric Denoisers in the plugin by clicking on **Settings Tree**, then clicking on **Imager**, followed by clicking on **Enable Denoising**. We recommend disabling **Denoise Volumes**, and enabling **Denoise On Completion**. To view the denoised pass, click on **Denoised Beauty** from the **OctaneRender Viewport** toolbar.

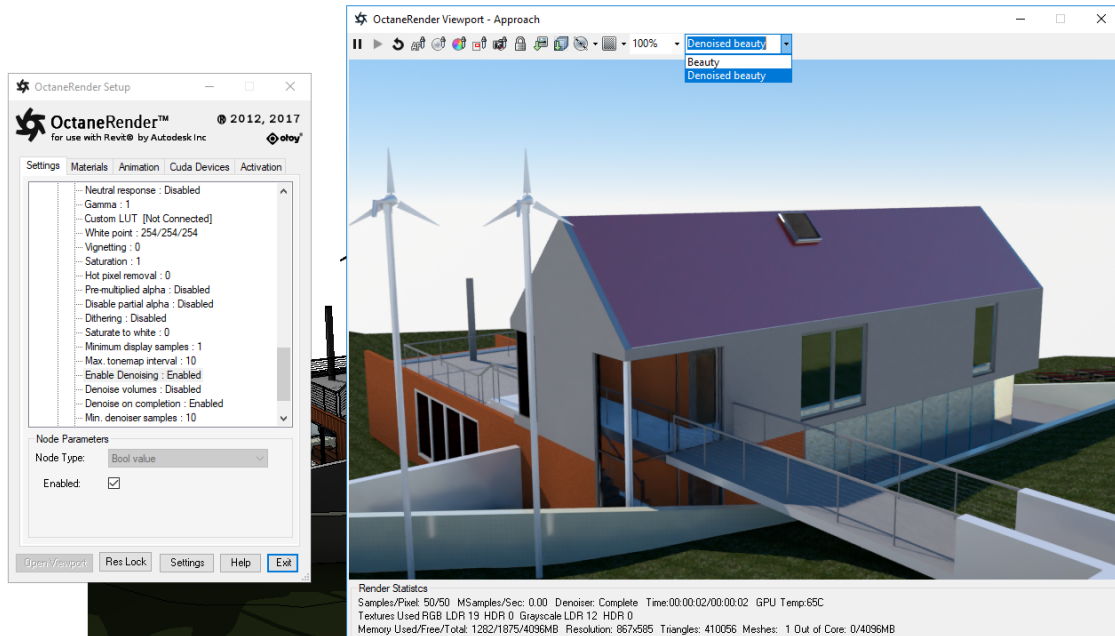


Figure 2: OctaneRender Viewport toolbar

AI Light

You can access the new OctaneRender® 4 AI Light settings by clicking on **Settings** tree, then click on **Kernel**. Refer to the AI Light topic of the Standalone Edition manual for more details.

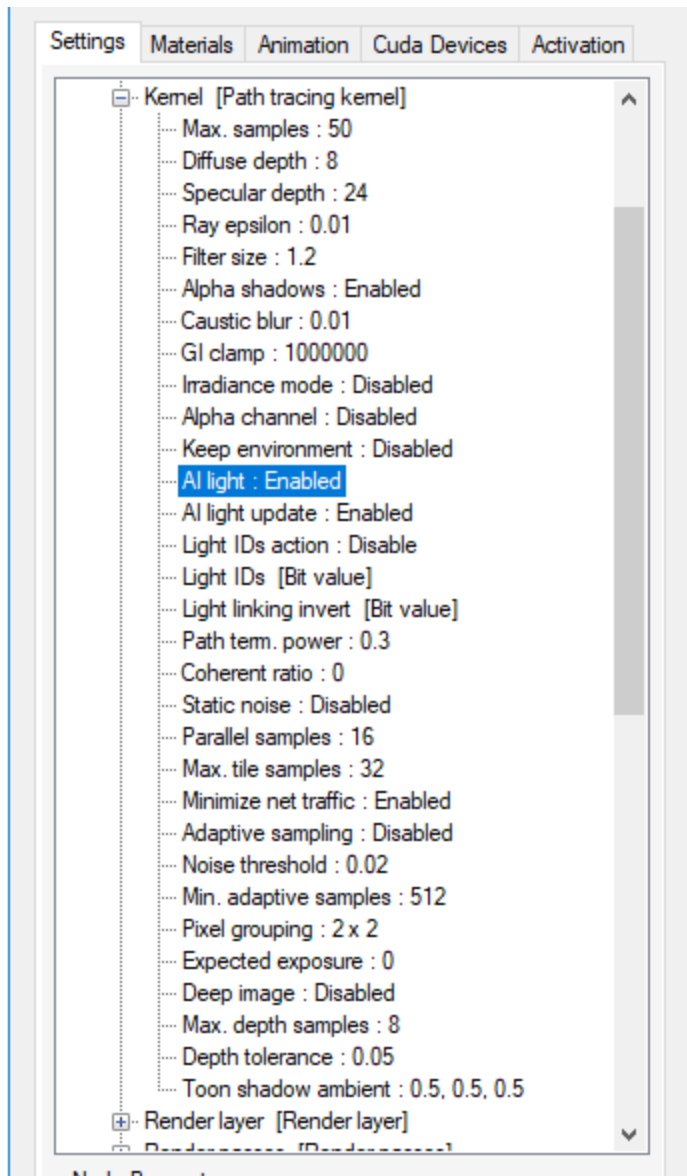


Figure 3: AI Light

Light Linking And Light Exclusion

This is not supported by the Revit® plugin, but the **Light ID** and **Light Linking Invert** pins are still present in the **Kernel** node for future use.

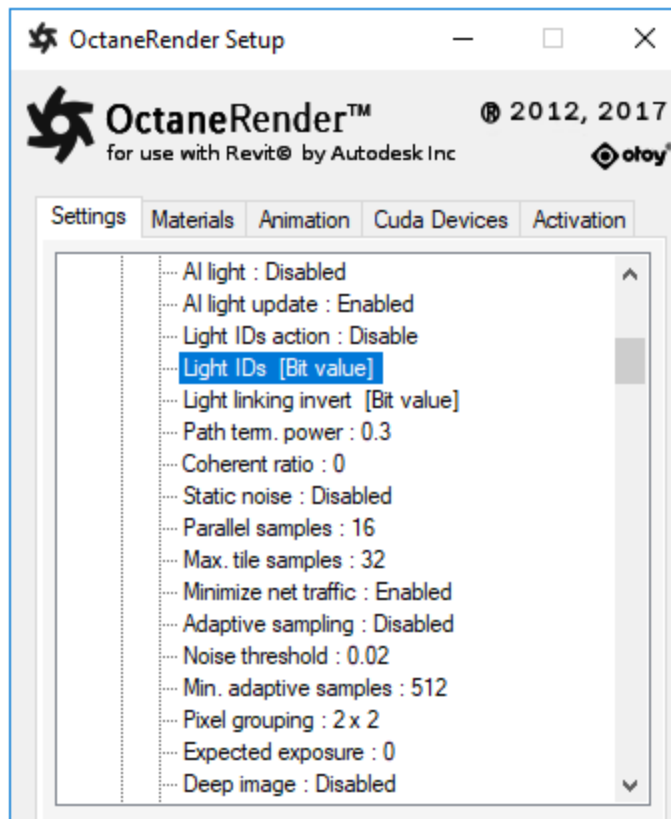


Figure 4: Light IDs

Planetary Environment System

This is a new **Environment** type in the Settings tree. This won't apply to most Revit® scenes. Refer to the Planetary Environment topic in the Standalone Edition manual for more details on this Environment.

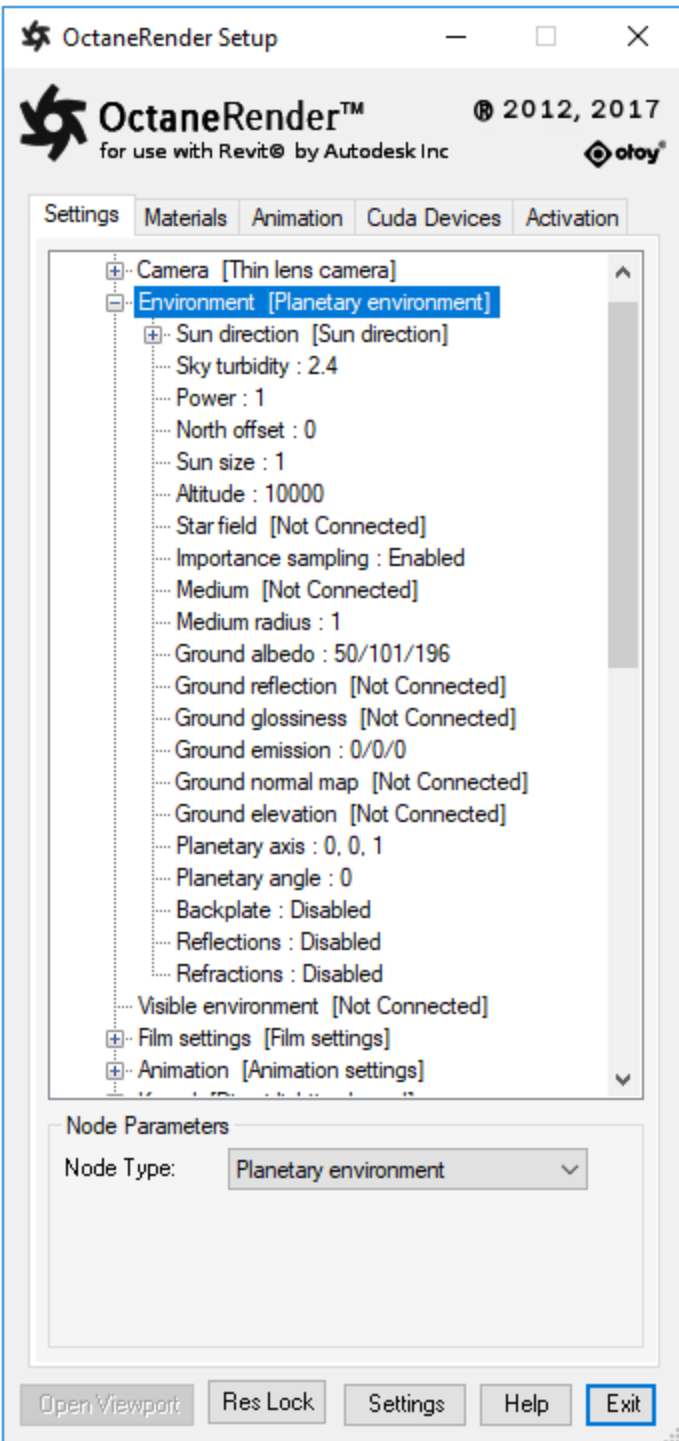


Figure 5: Planetary Environment

Universal Material

This is a new material type available in the **Materials**¹ tab. Refer to the Universal **Material**² topic of the Standalone Edition manual for additional information on this material type.

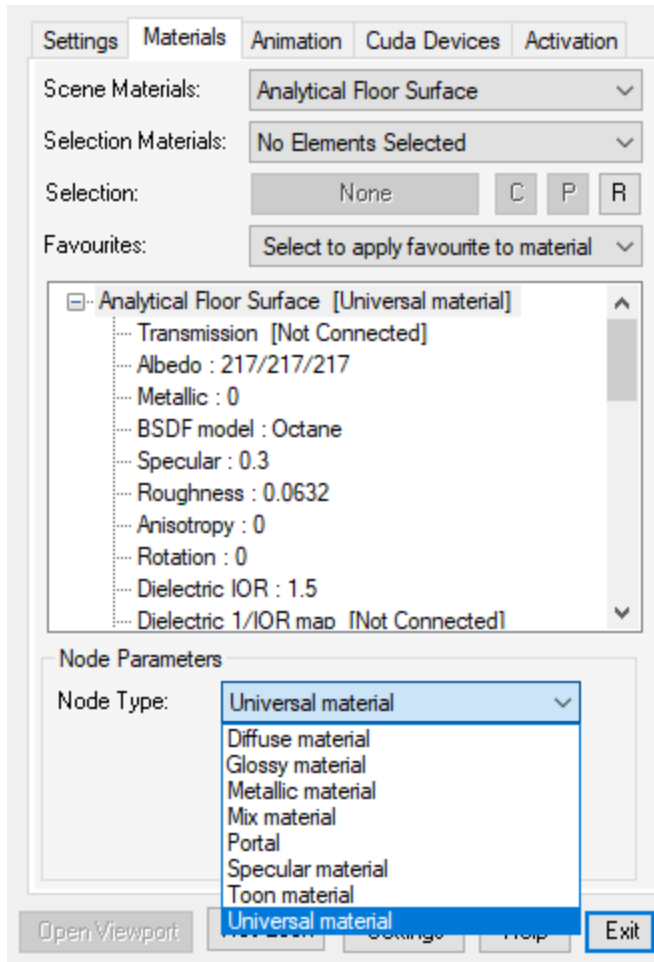


Figure 6: Universal Material

¹A set of attributes or parameters that describe surface characteristics.

²The representation of the surface or volume properties of an object.

Note: **UDIM Textures**¹ and **Texture Compression** are not supported by the Revit® plugin.

¹Textures are used to add details to a surface. Textures can be procedural or imported raster files.

Limitations

- Can only start the plugin when viewing a 2D View.
- The viewport cannot be opened when the Revit document is in "Readonly" mode.
- The plugin will not open in Family edit documents.
- Rendering of Decals is not currently supported (see Decals section on how to render decals).
- Only texturemaps from the Revit 2016, 2017 and 2018 standard library material will automatically transfer during material conversion. For other material, you will need to manually specify the texturemaps in the Octane material.
- Conversion of Revit Light Sources to Octane geometry emitters is not supported. All Octane emitters need to be actual geometry in the scene, rather than Revit lights. So to create emitter geometry, add geometry to the Revit scene and assign an Octane emitter to it's material
- Rendering of ArchVision RPC families is not currently supported, but is planned (and you can use Geometry Proxies instead).
- Rendering of Revit family instances which have no geometry (Studio Light for example) is not supported.
- **Proxy**¹ items (OBJ files) can only be applied to Revit components or family instances which are placed on horizontal surfaces (and not placed on items like walls). Using proxy host items which are upright (for example, a family instance placed on a wall) will result in the proxy OBJ file rendering with the incorrect rotation.

Multi-Lingual Support

Revit can be started in languages other than English via this [link](#) . However there are limitations to the plugin functionality when using languages other than English, so it is recommended to start Revit in English when using the plugin. The limitations are:

- Octane data will not be saved or reloaded from the .rvt file for some languages. When this happens, a "Project Browser element not found" error will be displayed.
- Animate Walkthrough and Export Walkthrough to OCS will only work when the Revit language is set to English. See "Walkthrough Animations" on page 60 for details.

¹An object saved as a separate file with the purpose of being reused in larger scenes. This is used to minimize any addition to the total polygon count in the scene, especially if the scene requires the same object to appear several times. If used in conjunction with instancing, Proxies help keep very large scenes from reaching polygon limits and also keeps the relative file size of the main project file manageable.

- Saving/exporting to OCS or **ORBX**¹ may not work correctly for some languages (Traditional Chinese for example).

¹The ORBX file format is the best way to transfer scene files from 3D Authoring software programs that use the Octane Plug-in such as Octane for Maya, Octane for Cinema 4D, or OctaneRender Standalone. This format is more efficient than FBX when working with Octane specific data as it provides a flexible, application independent format. ORBX is a container format that includes all animation data, models, textures etc. that is needed to transfer an Octane scene from one application to another.

FAQ

1. **Should I be enabling "smooth" on materials or not?**

In general, due to the nature of the way Revit constructs the flat surface geometry, the vast majority of material should have "smooth" DISABLED. Only curved surfaces should be "smooth" enabled (like grass, motor vehicles, etc).

2. **Windows becomes unresponsive when rendering large scenes.**

This is due to using the same card for Octane rendering and for your Windows display adapter. It is highly recommend to have a separate card as your Windows display adapter (your on-board graphics card for example).

If you are using one card, set the Render Priority to Low.

For reference, Otoy have recommended registry settings that you should use:

In cases of the Windows Vista/7 "Timeout Detection and Recovery" <http://msdn.microsoft.com/en-us/library ... 87368.aspx>. Settings can be changed using Regedit. The recommended setting for Octane are registry setting HKLMSystemCurrentControlSetControlGraphicsDrivers, TdrLevel = 3, TdrDelay = 10 (if these settings are not already there, rightclick the right panel -> New -> DWORD). You will need to reboot after changing these settings.

3. **I am an experienced OctaneRender Standalone user, and would like to access the node graph in the Revit plugin.**

The Revit plugin does not have a node graph. Instead it uses a tree structure which enables macro type functions (copy, paste, import, export, etc) which is more efficient and much better matches the Revit workflow.

4. **Can I import a material from an OCM file exported from Octane Standalone?**

Not at this stage, but it is planned.

5. **How many texturemaps can I fit in my card?**

The GTX 500 series cards have a limit of 64 **LDR**¹ (8 bit) RGBA, 32 LDR (8 bit) greyscale, 4 HDR (16 bit) RGBA and 4 HDR (16 bit) greyscale texturemaps. The GTX 600 series cards have a limit of 144 LDR (8 bit) RGBA, 68 LDR (8 bit) greyscale, 10 HDR (16 bit) RGBA and 10 HDR (16 bit) greyscale texturemaps.

6. **If I get two graphics cards, do I double the memory available?**

¹Image formats that have 8 bits per color channel such as the common image formats JPEG, PNG, GIF among others.

No, the memory available will be the memory capacity of the smallest card in your system. If you have a 1Gb and a 2Gb card, and need over 1Gb of memory for your scene, turn off the 1Gb card in the Cuda Devices tab of the plugin.

7. **Is Octane “Instancing¹” supported?**

Yes.

8. **Can texture map have their tiling disabled, be offset, or rotated?**

Yes.

9. **What does “Error searching for missing texturemap ...You do not have read access to that folder” mean?**

When a Revit scene is loaded which has Octane materials, the plugin checks to ensure the texturemap files for each Octane RGB Image node actually exist on your hard disk. If they do not, the plugin requests the user select a search path for locating the missing texturemap. If you “Cancel” at this point, searching for missing texturemaps is aborted (and if you open the Viewport, Octane will report an error for the missing texturemap, but the Viewport will still open and the render will still start). However, if you do not Cancel, and instead specify a search path, the plugin will search all folders inside that search path for the missing file(s). If the plugin encounters a folder within the search path for which the users does not have read access to (i.e., the plugin cannot read the files in that folder), the message “You do not have read access to that folder” is displayed. If you get this error, refine the search path so that it is searching a folder which you do have access to.

10. **The OctaneRender Viewport renders black after upgrading from Octane 1 to Octane 2.**

During the upgrade, your graphics card may have been disabled by Octane. To fix this, go into the Devices page of the plugin and re-tick “Active” for your video card.

11. **The OctaneRender Viewport has disappeared off the screen – how do I get it back?**

This might happen if you put the Viewport on a second monitor, then disable that monitor (Revit will “remember” the window position on the second monitor and place the Viewport there out of sight). The easiest solution is to delete your config.xml file (as per the “Configuration” on page 10 topic).

12. **“Failed to initialize the add-in Octane render for Revit” message when starting Revit.**

This is due to either not having Cuda drivers installed, or by starting Revit NOT via Revit.exe (i.e., you have started Revit by double-clicking an .rvt file). To fix the second situation, edit OctaneRender_for_Revit.addin as per the “Configuration” on page 10 topic.

13. **“Unable to load DLL ‘OctaneWrapper.dll’” error message.**

¹Instancing an object means taking a single imported mesh object, such as an OBJ or an FBX and making multiple copies, each of which can be placed in different parts of the scene. This saves an enormous amount of computational resources because only a single object is loaded into the scene.

This is due to either not having Nvidia video drivers loaded, or not having a sufficiently recent enough version of these drivers. Please see FAQ questions 1 and 2 [here](#) for details.

Glossary

A

Absorption

Defines how fast light is absorbed while passing through a medium.

Adaptive Sampling

A method of sampling that determines if areas of a rendering require more sampling than other areas instead of sampling the entire rendering equally.

Alembic

An open format used to bake animated scenes for easy transfer between digital content creation tools.

Alpha Channel

A greyscale image used to determine which areas of a texture map are opaque and which areas are transparent.

Anti-Ghosting

The automatic or manual correction involved in the merging a stack of images during the creation of a High Dynamic Range image. The process aims to correct the strange effect when objects that change position in the image set is partially visible (like a ghost) in the final HDR image.

Aperture

Determines how much light enters a camera lens. A large aperture produces a narrow depth of field and a small aperture produces a wide depth of field.

AR

Viewing a conceptual three dimensional scene in context to see how it might look in the real world.

Augmented Reality

Viewing a conceptual three dimensional scene in context to see how it might look in the real world.

B

Batch Rendering

The process of assigning sequential portions of frames to be rendered across multiple systems.

Black Body

An opaque object that emits thermal radiation. In Octane, this is used to designate illumination properties for mesh emitters.

D

Deep Image

Renders frames with multiple depth samples in addition to typical color and opacity channels.

Depth Buffer

A measure of object distances from the camera typically represented as a grayscale image.

Depth of Field

The distance between the nearest and farthest objects in a scene that appear acceptably sharp in an image. Although a lens can precisely focus at only one distance at a time, the decrease in sharpness is gradual on each side of the focused distance, so that within the DOF, the unsharpness is imperceptible under normal viewing conditions. source: wikipedia (https://en.wikipedia.org/wiki/Depth_of_field)

Diffuse

Amount of diffusion, or the reflection of light photons at different angles from an uneven or granular surface. Used for dull, non-reflecting materials or mesh

emitters.

Diffuse material

Used for dull, non-reflecting materials or mesh emitters.

Displacement

The process of utilizing a 2D texture map to generate 3D surface relief. As opposed to bump and normal mapping, Displacement mapping does not only provide the illusion of depth but it effectively displaces the actual geometric position of points over the textured surface.

DoF

The distance between the nearest and farthest objects in a scene that appear acceptably sharp in an image. Although a lens can precisely focus at only one distance at a time, the decrease in sharpness is gradual on each side of the focused distance, so that within the DOF, the unsharpness is imperceptible under normal viewing conditions. source: wikipedia (https://en.wikipedia.org/wiki/Depth_of_field)

Drivers

Files that allow hardware devices to communicate with an operating system. In the case of Octane, the latest Nvidia drivers should be used.

E

Effective Focus Range

The distance between the nearest and farthest objects in a scene that appear acceptably sharp in an image. Although a lens can precisely focus at only one distance at a time, the decrease in sharpness is gradual on each side of the focused distance, so that within the DOF, the unsharpness is imperceptible under normal viewing conditions. source: wikipedia (https://en.wikipedia.org/wiki/Depth_of_field)

Emissions

The process by which a Black body or Texture is used to emit light from a surface.

EXR

Also known as OpenEXR. This image file format was developed by Industrial Light & Magic and provides a High Dynamic Range image capable of storing deep image data on a frame-by-frame basis.

F

FBX

.fbx (Filmbox) is a proprietary file format developed by Kaydara and owned by Autodesk since 2006. It is used to provide interoperability between digital content creation applications. As of Octane 3.07, a scene node will also be available as an FBX file, allowing for quick and easy transport of assets from industry standard DCC applications

Field of View

The area that is visible to a camera lens usually measured in millimeters. A wide angle lens provides a larger field of view and a telephoto lens provides a narrow field of view.

Focus Range

The distance between the nearest and farthest objects in a scene that appear acceptably sharp in an image. Although a lens can precisely focus at only one distance at a time, the decrease in sharpness is gradual on each side of the focused distance, so that within the DOF, the unsharpness is imperceptible under normal viewing conditions. source: wikipedia (https://en.wikipedia.org/wiki/Depth_of_field)

FoV

The area that is visible to a camera lens usually measured in millimeters. A wide angle lens provides a larger field of view and a telephoto lens provides a narrow field of view.

G

Gamma

The function or attribute used to code or decode luminance for common displays. The computer graphics industry has set a standard gamma setting of 2.2 making it the most common default for 3D modelling and rendering applications.

Glossy

The measure of how well light is reflected from a surface in the specular direction, the amount and way in which the light is spread around the specular direction, and the change in specular reflection as the specular angle changes. Used for shiny materials such as plastics or metals.

Glossy material

Used for shiny materials such as plastics or metals.

GPU

The GPU is responsible for displaying graphical elements on a computer display. The GPU plays a key role in the Octane rendering process as the CUDA cores are utilized during the rendering process.

Graphics Card

The GPU is responsible for displaying graphical elements on a computer display. The GPU plays a key role in the Octane rendering process as the CUDA cores are utilized during the rendering process.

H

Hardware

Any physical device present in a computer system. A Nvidia GPU is a required hardware device for using the Octane Render engine.

HDRI

An image which presents more than 8 bit per color channel unlike most common image formats.

High Dynamic Range Image

An image which presents more than 8 bit per color channel unlike most common image formats.

I

IES

An IES light is the lighting information representing the real-world lighting values for specific light fixtures. For more information, visit <http://www.ies.org/lighting/>.

IFL

(Image File List) file is an ASCII file that constructs an animation by listing single-frame bitmap files to be used for each rendered frame. When you assign an IFL file as a bitmap, rendering steps through each specified frame, resulting in an animated map. (reference: <https://knowledge.autodesk.com/support/3ds-max/learn-explore/caas/CloudHelp/cloudhelp/2017/ENU/3DSMax/files/GUID-CA63616D-9E87-42FC-8E84-D67E1990EE71-htm.html>)

Independent Software Vendor

An individual or business that builds, develops and sells consumer or enterprise software. Although ISV-provided software is consumed by end users, it remains the property of the vendor. An ISV is also known as a software publisher.

Instancing

Instancing an object means taking a single imported mesh object, such as an OBJ or an FBX and making multiple copies, each of which can be placed in different parts of the scene. This saves an enormous amount of computational resources because only a single object is loaded into the scene.

Interactive Photorealistic Rendering

Provides artists a quick preview of the image prior to the final render, and efficiently allows for adjusting some elements in the scene such as lights, shaders and textures interactively. An IPR image contains shading and lighting data including some for visibility, in addition to the software render.

IPR

Provides artists a quick preview of the image prior to the final render, and efficiently allows for adjusting some elements in the scene such as lights, shaders and textures interactively. An IPR image contains shading and lighting data including some for visibility, in addition to the software render.

ISV

An individual or business that builds, develops and sells consumer or enterprise software. Although ISV-provided software is consumed by end users, it remains the property of the vendor. An ISV is also known as a software publisher.

K

Kernels

By definition, this is the central or most important part of something. In Octane, the Kernels are the heart of the render engine.

L

LDR

Image formats that have 8 bits per color channel such as the common image formats JPEG, PNG, GIF among others.

Low Dynamic Range

Image formats that have 8 bits per color channel such as the common image formats JPEG, PNG, GIF among others.

Lua

A scripting language that supports procedural, object-oriented, functional, and data-driven programming. It can be used to extend Octane's functionality. A scripting language that supports procedural, object-oriented, functional, and data-driven programming. It can be used to extend Octane's functionality.

Lua Scripting

A scripting language that supports procedural, object-oriented, functional, and data-driven programming. It can be used to extend Octane's functionality. A scripting language that supports procedural, object-oriented, functional, and data-driven programming. It can be used to extend Octane's functionality.

M

Material

The representation of the surface or volume properties of an object.

Materials

A set of attributes or parameters that describe surface characteristics.

Mediums

The behavior of light inside a surface volume described by scatter, absorption, and transmission characteristics.

Mesh Emitters

The ability for a surface to emit illumination usually described by a Black Body or Texture emission type.

Mix material

Used to mix any two material types.

Mixed

The ratio of diffuse and specular reflection.

Motion Blur

An optical phenomenon that occurs when a camera's shutter opens and closes too slowly to capture movement without recording a blurring of the subject.

N

Network Rendering

The utilization of multiple CPUs or GPUs over a network to complete the rendering process.

NGE

Node Graph Editor

O

Open Shader Language

A shading language developed by Sony Pictures Imageworks. There are multiple render engines that utilize OSL as it is particularly suited for physically-based renderers.

Open SubDiv Surfaces

A set of open source libraries that implement high performance subdivision surface (subdiv) evaluation on massively parallel CPU and GPU architectures. This code path is optimized for drawing deforming surfaces with static topology at interactive framerates. Source: Pixar (<http://graphics.pixar.com/opensubdiv/docs/intro.html>).

OpenVDB

Dreamworks' open-source C++ library housing the data structures and tools implementation for storing and manipulating volume data, like smoke and other amorphous materials. The purpose of OpenVDB is mostly to have an efficient way to store volumetric data in memory and on disk. It has evolved into a more general toolkit that also lets you accomplish other things, such as fracturing volumes, converting meshes to volumes and vice versa. However, it does not include a computational fluid dynamics solver, and therefore it cannot procedurally generate smoke or fire. OpenVDB is fully integrated as a library in OctaneRender. For more information about OpenVDB, check at <http://www.openvdb.org/>.

ORBX

The ORBX file format is the best way to transfer scene files from 3D Authoring software programs that use the Octane Plug-in such as Octane for Maya, Octane for Cinema 4D, or OctaneRender Standalone. This format is more efficient than FBX when working with Octane specific data as it provides a flexible, application independent format. ORBX is a container format that includes all animation data, models, textures etc. that is needed to transfer an Octane scene from one application to another.

Out-of-Core

When scene assets become too large to load completely onto the system's GPU, Out-of-Core technology allows the render engine to utilize the CPU to assist in the rendering process.

P

PBR

A contemporary shading and rendering process that seeks to simplify shading characteristics while providing a more accurate representation of lighting in the real world.

Portal

A technique that assists the render kernel with exterior light sources that illuminate interiors. In interior renderings with windows, it is difficult for the path tracer to find light from the outside environment and optimally render the scene. Portals are planes that are added to the scene with the Portal material applied to them.

Post Processing

Effects such as Bloom and Glare that are applied after a scene has been rendered.

Projections

Methods for orienting 2D texture maps onto 3D surfaces.

Proxy

An object saved as a separate file with the purpose of being reused in larger scenes. This is used to minimize any addition to the total polygon count in the scene, especially if the scene requires the same object to appear several times. If used in conjunction with instancing, Proxies help keep very large scenes from reaching polygon limits and also keeps the relative file size of the main project file manageable.

Proxy Server

A Proxy Server, also known as an application-level gateway, is an intermediary server between the local network and the external servers from which a client is requesting a service. The external servers will only see the network proxy server's IP address thus providing some degree of security and privacy. There are various kinds of proxies, the most common are Web Proxies.

R

RAW

In HDR imaging, this refers to minimally processed HDR image formats. Raw files can have 12 or 14 bits per color channel, although the available dynamic range might be cut down due to noise.

Render Layers

Render layers allow users to separate their scene geometry into parts, where one part is meant to be visible and the rest of the other parts "capture" the side effects of the visible geometry. The layers allow different objects to be rendered into separate images where, in turn, some normal render passes may be applied. The Render layers are meant for compositing and not to hide parts of the scene.

Render Passes

Render passes allow a rendered frame to be further broken down beyond the capabilities of Render Layers. Render Passes vary among render engines but typically they allow an image to be separated into its fundamental visual components such as diffuse, ambient, specular, etc..

S

Scattering

Defines how fast light gets scattered when traveling through the medium.

Shadow Catcher

The Shadow Catcher can be used to create shadows cast by objects onto the surrounding background imagery. The shadows cast are not limited to simply a ground plane but can be cast onto other surfaces of varying shapes.

Spectral Light Transport

A technique in which a scene's light transport is modeled with real wavelengths. Spectral rendering can also simulate light sources and objects more effectively, as the light's emission spectrum can be used to release photons at a particular wavelength in proportion to the spectrum. Source: Wikipedia (https://en.wikipedia.org/wiki/Spectral_rendering).

Specular

Amount of specular reflection, or the mirror-like reflection of light photons at the same angle. Used for transparent materials such as glass and water.

Specular material

Used for transparent materials such as glass and water.

T

Texture Baking

A process in which scene lighting is "baked" into a texture map based on an object's UV texture coordinates. The resulting texture can then be mapped back onto the surface to create realistic lighting in a real-time rendering environment. This technique is frequently used in game engines and virtual reality for creating realistic environments with minimal rendering overhead.

Textures

Textures are used to add details to a surface. Textures can be procedural or imported raster files.

TMO

Maps HDR images to standard displays which have a limited dynamic range. The more prominent TMOs are Mantiuk'06, Reinhard'02, Drago, and Durand.

Tone Mapping

A term referring to various methods of “converting” HDR images into a viewable format.

Tone Mapping Operator

Maps HDR images to standard displays which have a limited dynamic range. The more prominent TMOs are Mantiuk'06, Reinhard'02, Drago, and Durand.

Transformations

Tools used to rotate and position 2D and 3D texture maps onto 3D surfaces.

Transmission

A surface characteristic that determines if light may pass through a surface volume.

U

Unbiased Rendering

Unbiased rendering does not introduce any “errors” or shortcuts into the rendering process. It will calculate all scene data using real-world calculations. This type of rendering is known for producing exceptional render quality.

V

VDB

Dreamworks' open-source C++ library housing the data structures and tools implementation for storing and manipulating volume data, like smoke and other

amorphous materials. The purpose of OpenVDB is mostly to have an efficient way to store volumetric data in memory and on disk. It has evolved into a more general toolkit that also lets you accomplish other things, such as fracturing volumes, converting meshes to volumes and vice versa. However, it does not include a computational fluid dynamics solver, and therefore it cannot procedurally generate smoke or fire. OpenVDB is fully integrated as a library in OctaneRender. For more information about OpenVDB, please see <http://www.openvdb.org/>.

Virtual Reality

Immersively engaging and experiencing depth perception in a three dimensional scene through stereo vision goggles and head-mounted displays.

Volume Medium

A shading system designed to render volumes such as smoke and fog.

VR

Immersively engaging and experiencing depth perception in a three dimensional scene through stereo vision goggles and head-mounted displays.

Z

Z-Buffer

A measure of object distances from the camera typically represented as a grayscale image.

Z-Depth

A measure of object distances from the camera typically represented as a grayscale image.

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