Vreel Skin v1.1

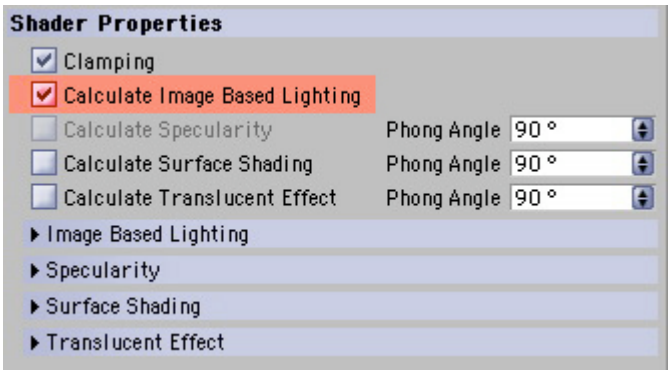
Additions to the v1.0 documentation

What is new ?

Basically Vreel Skin now includes its own illumination system, which is based on loaded images or shaders. The advantage of this is, that you can now use any image to light your object without having to use GI or Radiosity for the scene calculation.
As this illumination effect is limited to the Vreel Skin material, you can still use a traditional light setup for other objects in your scene.

How does it work ?

First thing you might notice is the the new option „Calculate Image Based Lighting“ (see image below). This option activates the internal lighting calculation. To avoid multiple highlights in this mode, the Specularity channel is deactivated by default if „Image Based Lighting“ is actve. If you need highlights, use a second Vreel Skin shader and add both shader results with a Layer or Fusion shader.



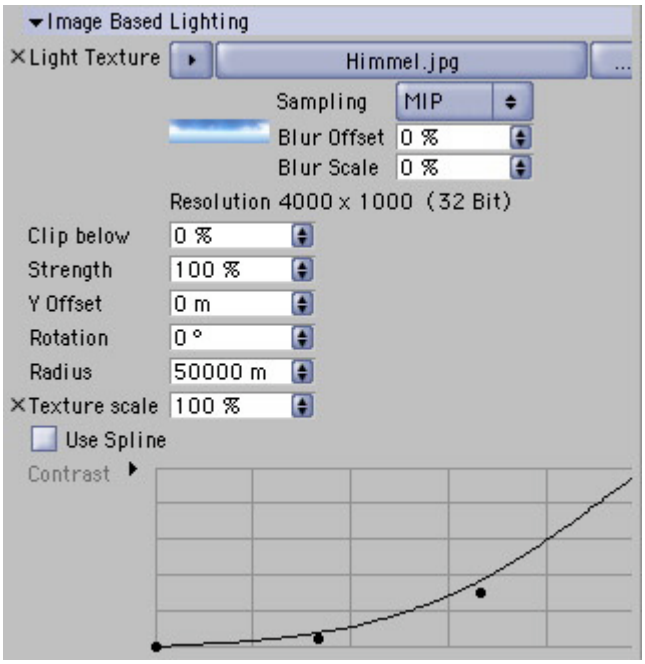
All relevant options and parameters for Image Based Lighting can be found in the new Image Based Lighting channel of the shader. Use the „Light Texture“ slot to load any HDRI, standard 24 Bit image or shader. This image or texture will be mapped on a virtual hemisphere that moves with the textured object.
The following parameters are used to set the dimension and orientation of that hemisphere and to control the brightness that is generated by the loaded texture.

„Clip below“ is the minimum brightness value that should be considered valid while reading out brightness informations from the image. All pixels with a brightness below this value will not be calculated. This can help to filter out the brighter parts of an image.

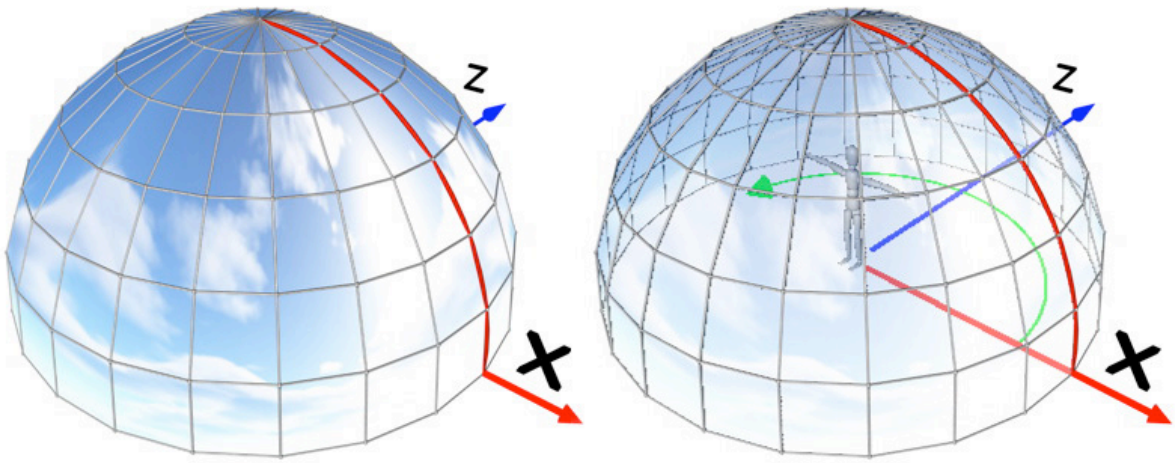
„Strength“ is an overall multiplicator for the brightness of the effect. If you use HDR images, you often will have to lower this value to avoid overexposure. Darker images will gain intensity by values above 100%.

Both parameters can be further tuned by the spline curve named „Contrast“. The right side of the spline window stands for the bright pixels in your image. The left side equals the dark and black pixels. The horizontal position of the spline points gives the multiplication of the pixel brightness. So using a splines as shown in the following image will result in an increase of contrast as the bright pixel keep their brightness and the medium to lower intensity pixels will be considered even weaker. If you want to use the spline, be sure to activate the „Use Spline“ option first.

After the image pixels are multiplied by the spline – if this option is active – the result is again multiplied by the „Strength“ value and then filtered by the „Clip below“ value.



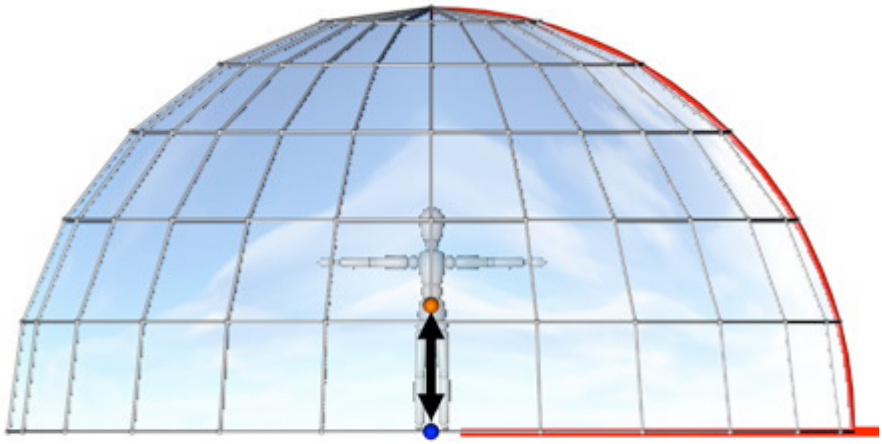
You already learned that the loaded image is mapped on a virtual hemisphere that surrounds the object with the Vreel Skin material. Take a look at the images below for a better understanding.



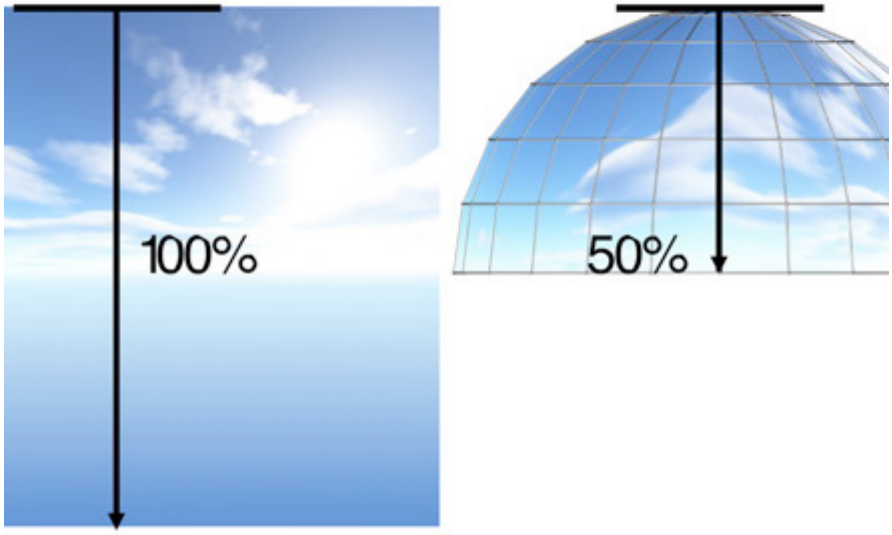
The most obvious parameter is the „Radius“ setting that is used to scale the hemisphere. The „Radius“ should be at least big enough to cover the textured object.
The „Rotation“ value sets a rotation around the world Y axis. The direction of rotation is indicated by the green arrow in the image above.

Using the „Rotation“ value can help to match the used texture to any background image or light setup you might have used in your scene. Just imagine a loaded HDR image that includes the sun. If you want your textured character to face the „sun“ in your scene, you might have to rotate the virtual hemisphere with the loaded texture so that the sun in the image is positioned in front of your character.

Vreel Skin uses the same UV mapping as Cinema 4D does, so if you’re not sure about the right rotation of your image, create a sphere object and apply the image as a texture to it. If you allow textures in your editor viewports, you will be able to see the loaded image mapped on the sphere. Rotate the sphere around the global Y axis untill the image has the right orientation. Copy the „H“ angle of the sphere to the Rotation value in the Vreel Skin dialog and you’re done.

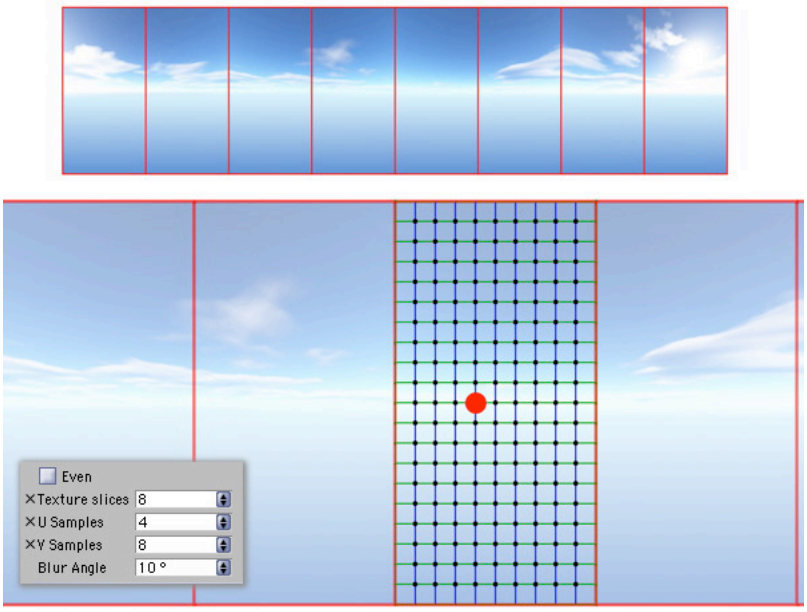


The virtual Dome will move with the textured object. Use the „Y Offset“ value to size the vertical offset between the local system of the textured object and the base of the virtual light dome. The image above indicated both positions with small colored spheres and the distance between them with arrows. This distance is the „Y Offset“. Use this value to place the base of the dome near the ground/floor of your scene.



As some panoramic images include elements that shouldn't be used for the light dome calculation, you can use the „Texture scale" value to scale the used part of the image (see image above).
As you can see, the original loaded image shows sky and clouds only in the upper part. Below the hoizont there is only a color gradient that doesn't give realistic lighting informations for our shader. By reducing the „Texture scale" to 50% only the upper 50% of the image will be used on the dome (see right image above).

The sampling of the image

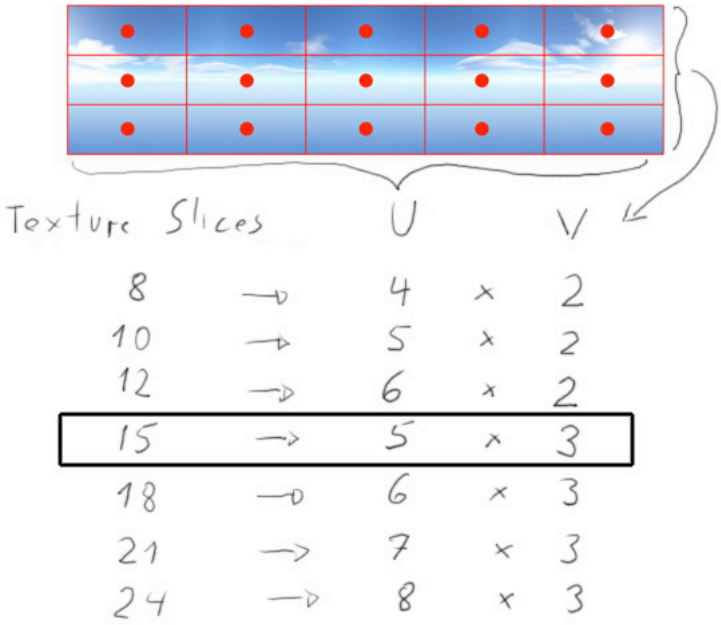


The loaded image is divided into so called „Texture slices", indicated as red rectangles in the image above. Each of these parts is further devided into horizantal and vertical parts. The number of divisions ist set with „U Samples" and „V Samples" for the X and Y direction. Color and brightness samples are taken for every sampled area. The brightest sample is stored for every Texture slice (see red circle in the image above).

This is the virtual lightsource of the calculated Texture slice, that will be used to light your material. **So increasing the number of Texture slices will also increase the number of virtual lightsources and the resulting render times. „U Samples“ and „V Samples“ only increase the precision of the calculation and not the number of virtual lightsources.**

The „Blur Angle“ activates a randomized variation of the position of the virtual lightsources. In combination with lower „Texture slices“ values this can generate nice, grainy effects, similar to the Cinema 4D Dirt shader.

Using the „Even“ option forces the virtual light sources to take symmetrical positions on the surface of the light dome (see image below).
As you can see in the image, the Texture slice value is now still controlling the overall number of virtual lightsources, but their placement is very different.



The scribbled chart above shows the resulting number of light sources in U and V direction for all possible Texture slices values. To take a Texture slices value of 15 as an example, this will result in 5 horizontal parts with 3 virtual lights each.
You can still use the „U Samples“ value to set the number of samples along the X direction, but this will not have any influence on the placement of the lights.

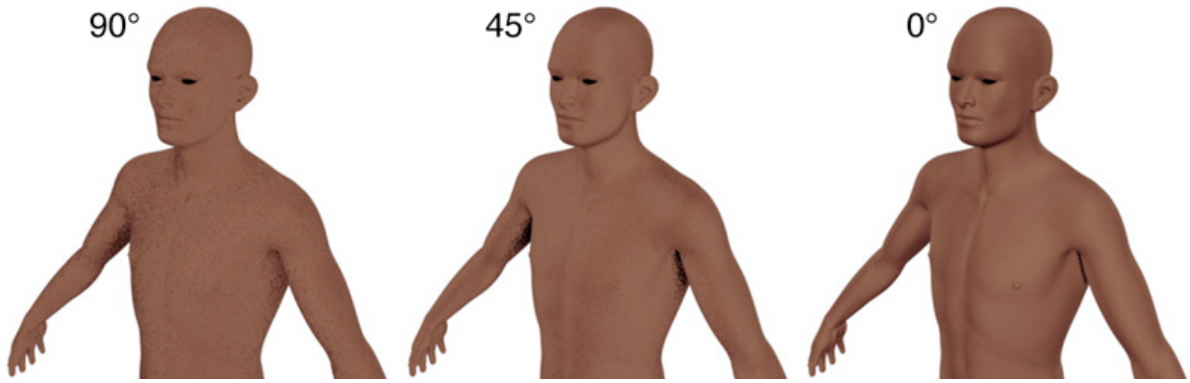
In „Even“ mode, all „Texture slices“ values will be rounded towards the next higher value in the chart. So entering 16, 17 or 18 will all result in 6 horizontal partings with 3 lights each.

The „Even“ distribution of virtual lights can help the generate a more diffuse kind of lighting, while the standard mode works better with high contrast images (HDRI for instace).

The image above shows an example for the standard mode („Even“ switched off) with a loaded HDR image. Most of the time you will have to lower the „Strength“ of the Image Based Lighting calculation when using HDRIs, as their brightness values can be well above 100%.

The loaded image was also placed in the background of the scene to demonstrate that the direction of the sun in the HDR image corresponds to the Vreel Skin lighting. As you can see at the eyes of the character, no real lightsources are active in this scne. It’s just image based lighting.

This technique will allow you to use Vreel Skin in radiosity calculations as no real lights are needed for this kind of calculation.



The images above show another example, this time using just plain white color in the „Light Texture“ slot and „Even“ light distribution.
As you can see, you can use the „Blur Angle“ to add more variations and noise to the calculation.

Beside this keep in mind that additional sampling is started within the Translucent Effect and Surface shading channels of Vreel Skin. All settings in the Image Base Lighting channel only affect the number and the placement of the virtual lights.
The other channels of Vreel Skin read out these virtual lights and continue their calculation as documented in the Vreel Skin v1.0 documentation.