Vreel Translucent Pro 1.2

Installation

Just unzipp the Translucent Pro folder and place it within CINEMA 4D's **plugins** folder. After you started CINEMA 4D V8.1+ two new shaders will be available within every material channel that supports images and shaders.
The **Translucent** shader is designed to give best result when used inside the Luminance channel, but you can also use it in Color or in Diffusion channels.
If you need to generate real transparent materials you should use the **Transparent** shader in the Transparency channel or the Alpha channel of the material.

Do not use the „Translucent" shader within Transparency or Alpha channels. This can force crashes during light calculation! Always use the „Transparent" shader with Transparency and Alpha channels! Take care that all relevant lightsources use shadows when using Translucent materials. Soft shadows work best.
You can also use both Translucent Pro shaders together with SLA shaders to build even more complex shaders. Have a look at the demo scenes that are available at our site www.vreel-3d.de.

Translucent shader

The „Render as solid object" option and the Shading/Lighting controls are relevant for all three different render modes of the Translucent shader. Therefore these functions are described at the end of the **Translucent** shader documentation.

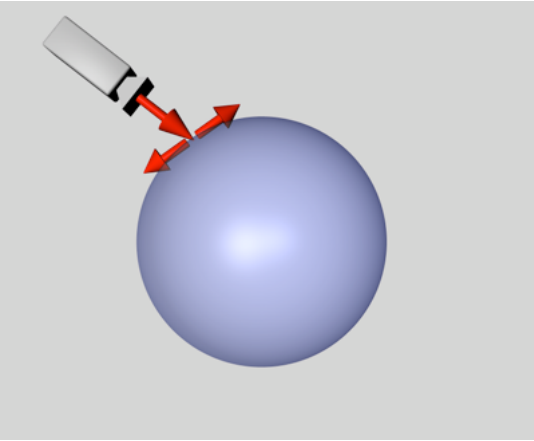
Translucent-Modes

Skin mode (option)
The shader includes three different modes:

- Skin mode (For less transparent materials. Quite fast to calculate.)
- Volume mode (For materials with more visible transparency. More precise calculation.)
- Transparency mode (When only the thickness of an object should be calculated)

The Skin mode should be used for materials that only have limited translucency, for example flesh, skin, plastic and stone. In Skin mode you have access to all parameters, but the **Light-Group** is not needed for this calculation. Any lightsources within the **Light-Group** are ignored in this mode. More about this functionality later.

Skin Mode switched on
The following explanations are only valid if you switched **Skin mode** on.

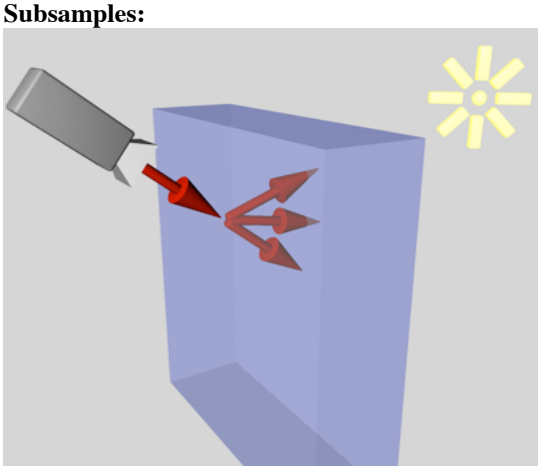


Directions:
This is the number of rays that are send out for every rendered surface point. Values between 3 and 5 should be fine for most objects.

Samples:
This is the number of samples that are taken along each „Direction" ray. Just increase this value above 1 when you are using larger Depth values.

(This images shows how the rendered ray is split into new rays when it hits the surface. The directions and samples per ray are controled by the Directions and Samples values.)

Subsamples:



This is the number of rays that are send out to calculate the object's thickness.
Values between 1 and 5 should be enough for most objects.
Always try to keep these values as low as possible as they increase render times.

Volume/Skin (Group)

Depth:
This is the legth of the „Direction" rays. Increasing the value adds more light to less lit parts of the object.

Brightness:
This is a simple multiplicator for the calculated shader brightness. This will only effect the brightness of the surface and not the intensity of the Transparent Thickness effect, that is explained a little bit later. A brightness of 0 switches off the „Volume/Skin" calculation.

Fresnel:
Maybe you already know the BhodiNUT Fresnel shader that comes with CINEMA 4D. This value works similar. Every face of the rendered object owns a normal vector. The angle between the viewing vector and the surface normal is the fresnel angle. A fresnel angle of 90° scales the brightness of the shader to 0% whenever the angle between the viewing vector and the surface vector is bigger than 90°. So only polygons that face the camera will have brigthness values above 0%. The object edges will not show any shader luminance. Increasing the fresnel value to higher values like 180° will lead to smoother tansitions between the different object parts.
A fresnel value of 0° disables this function and the shader brightness is calculated independently from the surface normals.
If you need more control over the fresnel effect, multiply the Translucent shader within a Fusion shader with the BhodiNUT fresnel shader.

dark->bright color gradient:
Here you can choose what color the shader should use for the „skin" part of the calculation. The choosen colors are multiplied with the calculated brightness values. The left border of the gradient stands for brightness values near 0%, the right border equals brightness values of 100% and above. If you need a color gradient starting with bright yellow in the highlights and ending in a dark blue near the shadows, place a yellow color slider on the right side of the gradient and a blue one on the left side. Remember that all choosen colors are multiplied with the calculated brightness. So you don't have to choose a dark blue, but a bright blue as it will be multiplied with a very weak brightness in this case.
Adding, editing and removing colors should already be familiar to you, as the same technique is used as in other gradient controls used by SLA or Cinema itself.

Transparent Thickness (Group)

Thickness:
This is the maximum distance light can travel through the object. The direction of the light rays is limited to the viewing angle. So no light from the sides will be taken into the calculation. Just light behind the object is relevant. When the backside of the object is not illuminated, this calculation will have no effect.

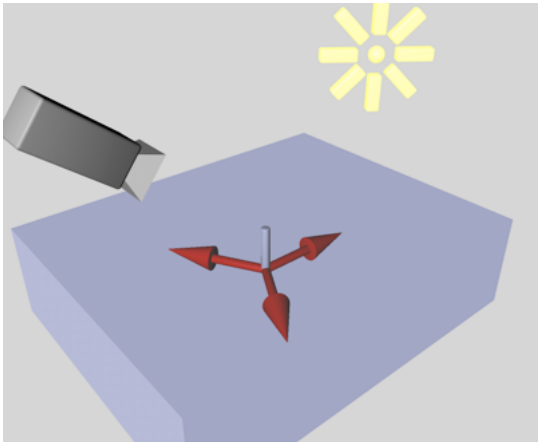
Brightness:
This is a simple multiplicator for the calculated shader brightness. This will only effect the translucent brightness and not the intensity of the surface shading. A brightness of 0 switches off the „Transparent thickness“ calculation.

Fresnel:
This works the same as the fresnel value in the Skin Group, but this time it only affects the brightness for the transparent thickness calculation.

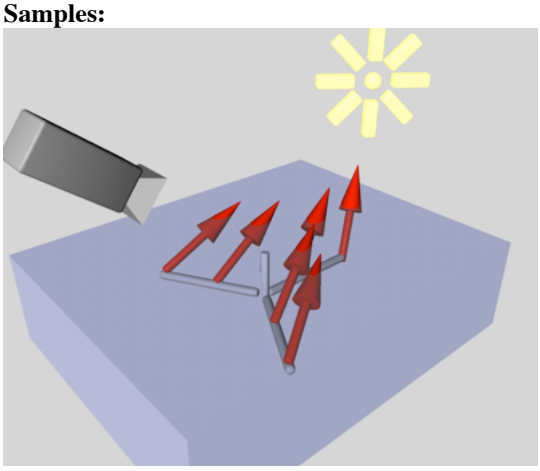
dark->bright color gradient:
Here you can choose what color the shader should use for the „Transparent thickness“ part of the calculation. The choosen colors are multiplied with the calculated brightness values. The left border of the gradient stands for brightness values near 0%, the right border equals brightness values of 100% and above. If you need a color gradient starting with bright yellow in the highlights and ending in a dark blue near the shadows, place a yellow color slider on the right side of the gradient and a blue one on the left side. Remember that all choosen colors are multiplicated with the calculated brightness. So you don't have to choose a dark blue, but a bright blue as it will be multiplied with a very weak brightness in this case.
Adding, editing and removing colors should already be familiar to you, as the same technique is used as in other gradient controls used by SLA or Cinema itself.

Volume mode
The following explanations are only valid if you switched **Skin mode** off.

In Volume mode rays are send through the object to measure the materials thickness, To minimize render times you have to specify in which directions rays should be send out. You do this by dragging light sources from the Object Manager to the **Light-Group** Drag and Drop field within the shaders dialog.
You will often not need more than one to three lights to get the desired effect. Just imagine an array of lights to the right of your object. You will just need to drag one of these lights to the Light-Group as the other lights are located in a very close range around that light.
Of course you could also use all lightsources, but this increases render times and the chance for overexposure. So just drag one light for every main light direction in your scene to the Light-Group. Of course this will have to be lights that are relevant for the shading of the object. Spot light pointing away from the object are not a good choice. Again, try to use as few lights in the Light-Group as possible to keep render times reasonable.

Directions:

This is the number of rays that are send out within the object after the camera ray entered the object. Values between 3 and 5 should be enough.

Samples:



This is the number of new rays that are generated for every direction ray. All sample rays are send out towards the lights that are placed in the **Light-Group**.

Subsamples:
Every sample ray can be split into another set of new rays. A value of 1 should work fine with most lighting conditions (this results in no additional rays), but sometimes it maybe useful to increase this value.

Just try to keep these values as low as possible to keep render times low. To give you an idea of the number of rays and included calculations imagine a scene with two lights that are placed within the shaders **Light-Group**. Maybe you used 3 directions with 2 Samples and 3 Subsamples. This will lead to 2 (Lights)*3(Directions)*2(Samples)*3(Subsamples)=36 ray calculations for every pixel of the rendered image. This number gets multiplied by the number of rayhits within the object and could therefore increase further.

Volume/Skin (Group)

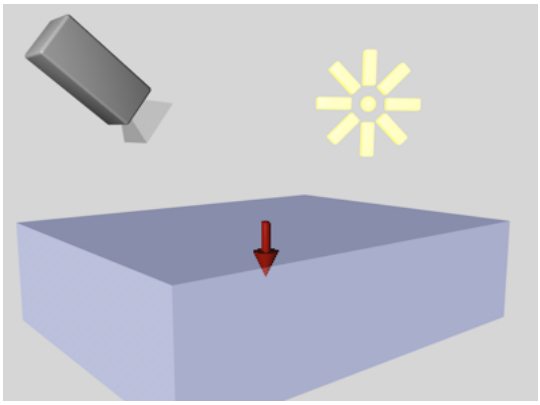
Depth:
The maximum distance for the light within the object. If light travels a distance bigger than the depth value within the object. it will no longer be seen.

Brightness:
This is a simple multiplicator for the calculated shader brightness. A brightness of 0 switches off all calculation and therefore doesn't make any sense here.

Fresnel:
Works the same as in Skin mode.

dark->bright color gradient:
Works the same as in Skin mode.

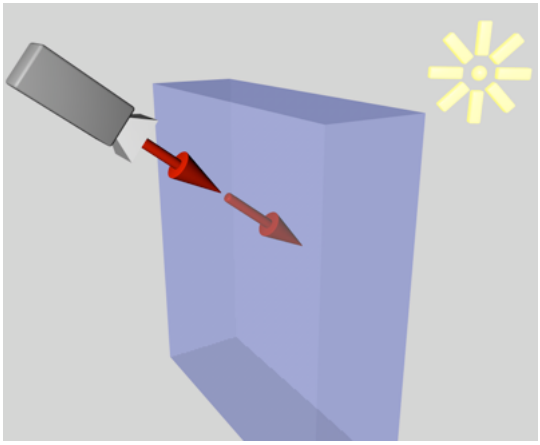
Transparent Thickness (Group)



Thickness:
This is the distance measured from the surface of the object that is transparent enough to let the biggest part of the light pass without splitting the light rays. After this distance the light will get reflected and refracted within the object. When this happens, light looses intensitiy and direction.

You should start with small numbers between 0.1 and 5.0.

Transparency mode
The Transparency option is switched on.

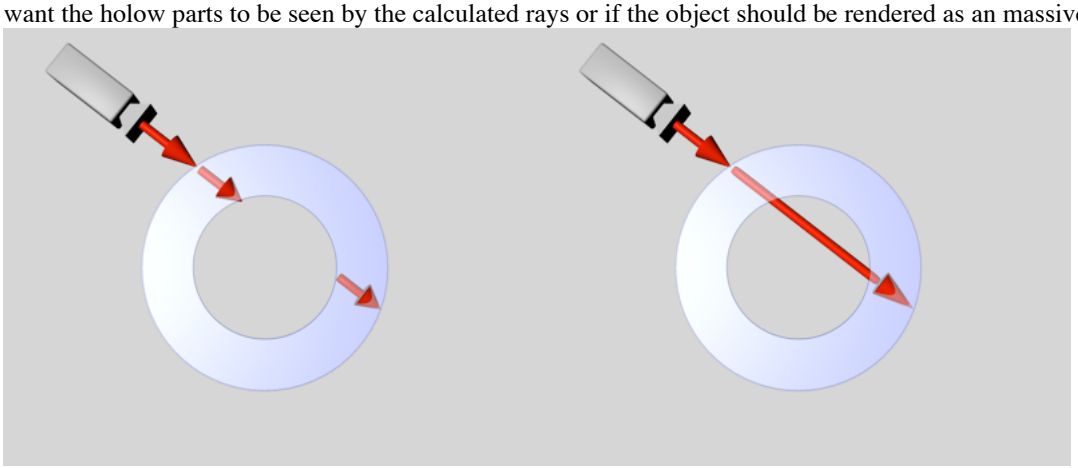


In this mode only the objects thickness is calculated. The value for **Subsamples** controls the smoothness of the calculation. This effect can be compared to the difference between hard and soft shadow calculation.
The result will look „smoother“ if you use **Subsamples** above 1 (3 or 5 are good values to start with if you need a smoother result).
The resulting color and brightness is independed from the lighting of the object and is only controled by the measured thickness.

All other parameters in the **Transparent Thickness** group work as in Volume mode.

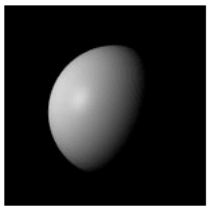
Additional options and functions

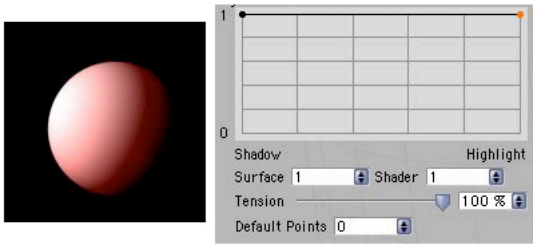
Render as solid object:
Objects can include „empty“ parts like for example cut out volumes. The status of this option controls if you want the holow parts to be seen by the calculated rays or if the object should be rendered as an massive object.

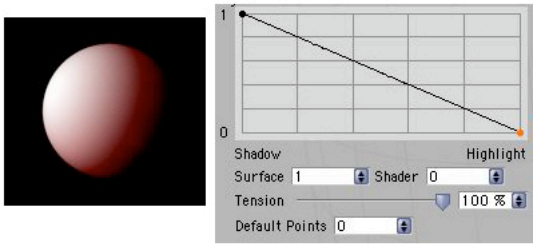


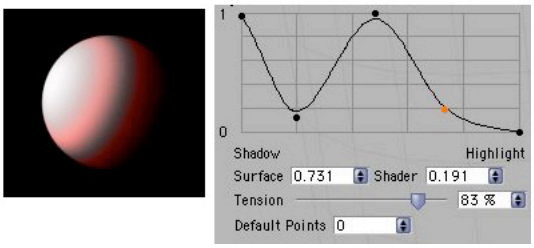
(The left image shows the calculation with the Render as solid object option switched off. The hollow part of the object is not taken into calculation.)

Diffuse multi (Spline control)









You can link the calculated shader brightness to the diffuse object brightness with the Spline control found at the bottom of the shader dialog in the **Shading/Lighting** group.

The left side of the spline window stands for the shadows on the object, the right side represents the highlights and bright lit surface areas. The vertical position of the spline curve is measured between the values 0 (bottom) and 1 (top). That spline value is used to multiply the shaders brightness.
The standard spline curve is a straight line from the high left to a low right position. This forces the shader to increase it's brightness when the objects surface gets darker. Already bright areas are not further brightened.
If you want to add the shaders calculated brightness no matter what the shading of the object is like, just pull the right spline point to the upper right corner of the spline window so the spline forms a horizontal line on the top of the window. So the **Diffuse multi** will be „1" no matter if the calculated pixel lays within a shadow or a highlight.
You can add more spline points by just clicking on the spline. Points can be move by selecting them with a click and moving them with the mouse or by entering values through the spline input fields that appear after a click on the small black triangle next to the spline window.
To remove spline points just drag them to a vertical position above the top border of the spline window.

In this image you can see some possible spline manipulations. On the top you can see the original scene with the un-textured sphere.
Below the sphere was textured with the Translucent shader in **Skin mode** (Transp. Thickness disabled). Just the spline shape was changed to get the shown results.
The topmost spline results in a full shader brightness no matter how bright the sphere is lit.
The spline in the middle reduces the shader brightness in relation to the sphere brightness. So the shader has a brightness of 0 when the sphere has a brightness of 1 and vis versa.
The image at the bottom shows a possible „special effect" curve. As you can see you can weaken or strengthen every brightness level of the shader with this spline.

Known Translucent shader limitations:

When using Translucent Pro within an SLA shader, the drag and drop functionality of the Light-Group area is not available. This is because the current SLA implementation doesn't support any actions outside of an active SLA dialog.
Solution: Configure Translucent Pro in any other material channel first. Then use the copy function, choose the SLA shader and paste Translucent Pro into the SLA shader.

Transparent Shader

You can use the **Transparent** shader in any material channel you like, but it is designed to give you the best results when used within Transparency or Alpha channels.
This shader is not light based but thickness based, So it will only calculate an objects thickness and return a color value based on that thickness and the **thick->thin** color gradient.
Most of the options and parameters work the same as in the **Translucent** shader.

Render as solid object (option)
Objects can include „empty" parts like for example cut out volumes. The status of this option controls if you want the holow parts to be seen by the calculated rays or if the object should be rendered as an massive object.
Have a look at the **Translucent** documentation for a more in depth explanation of this mode.

Subsamples
This value controls the smoothness of the calculation. This effect can be compared to the difference between hard and soft shadow calculation.
The result will look „smoother" if you use **Subsamples** above 1 (3 or 5 are good values to start with if you need a smoother result).
Keep in mind that more **Subsamples** will result in longer render times.

Transparent Thickness (Group)

Thickness
This is the maximum distance light can travel in this object. If an object part is thicker than this value, no light can pass. Thinner parts will let more light pass resulting in a brighter shader result.
The thickness is calculated in viewing direction.

Brightness
This is a simple multiplicator for the calculated shader brightness. A brightness of 0 switches off all calculation and therefore doesn't make any sense here.
You can use values above „1" to strengthen the effect.

Fresnel
Maybe you already know the BhodiNUT Fresnel shader that comes with CINEMA 4D. This value works similar. Every face of the rendered object owns a normal vector. The angle between the viewing vector and the surface normal is the fresnel angle. A fresnel angle of 90° scales the brightness of the shader to 0% whenever the angle between the viewing vector and the surface vector is bigger than 90°. So only polygons that face the camera will have brigthness values above 0%. The object edges will not show any shader luminance. Increasing the fresnel value to higher values like 180° will lead to smoother tansitions between the different object parts.
A fresnel value of 0° disables this function and the shader brightness is calculated independently from the surface normals.
If you need more control over the fresnel effect, multiply the Translucent shader within a Fusion shader with the BhodiNUT fresnel shader.

thick->thin color gradient
Here you can choose what color the shader should use for the „Transparent thickness" part of the calculation. The choosen colors are multiplied with the calculated brightness values. The left border of the gradient stands for those object parts that are thicker than the **Thickness** value, the right border equals object parts that are about 0m thin. If you need a color gradient starting with bright yellow on the thin parts and ending in a dark blue near the thicker parts, place a yellow color slider on the right side of the gradient and a blue one on the left side.
Adding, editing and removing colors should already be familiar to you, as the same technique is used as in other gradient controls used by SLA or Cinema itself.

Translucent Free (Freeware version)

The freeware version of Translucent Pro only offers the **Translucent** shader that can only be used with the Color and Luminance channels. There is also only the **Skin mode** available and some of the more advance functions, like **Fresnel** and **Diffuse multi** are not included.
For a description of the other available options and parameteres please see the **Translucent** shader documentation.

Please visit our site www.vreel-3d.de from time to time to watch out for new sample scenes, tutorials and other plugin offers. Please send questions or comments to info@vreel-3d.de.