

V-Ray Hair 3

This page provides information on the BRDFHair3 material node.

This material has been deprecated and hence is hidden from the UI.

Overview

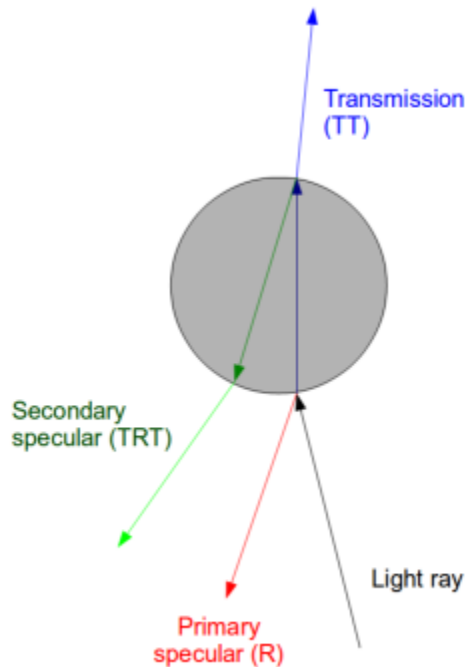
BRDFHair3 is a material that is primarily designed for rendering hair and fur.

Components of BRDFHair3

The material is based around three components - primary specular component, secondary specular component, and a transmission component. A diffuse component is also provided for rendering of materials made up of cloth threads or other non-translucent fibers.

The primary specular component represents light that is reflected off the outer surface of a hair strand. The secondary specular component represents light that goes through the hair strand and is reflected off the back surface. The transmission component represents light that goes through the hair strand.

The image below illustrates the meaning of the three components:



Overall

Color – A common color multiplier for all color components in the material (except for opacity). Used to easily change the look of the entire hair material.

Transparency – Controls the transparency of the material. The transparency can be mapped along the hair strands using the **VRayFurSampler** texture. Making the hair more transparent towards the tip may produce more smooth and realistic anti-aliasing at the expense of increased render times. If you map the tip opacity, make sure you *don't* make the strands thinner at the tip as well - transparency already creates the effect of thinning strands. You can enable the **Opaque for Shadows** and **Opaque for GI** options to reduce render times for transparent hair. Note that with transparent strands, it may be necessary to increase the **Max. Transp. Levels** option in the global V-Ray settings too.

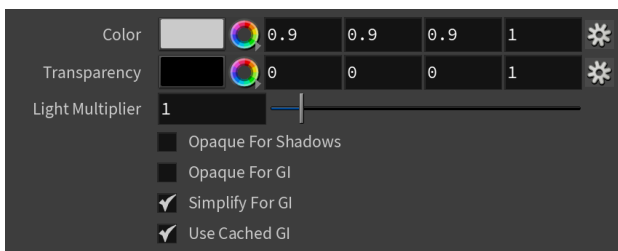
Light Multiplier – In the absence of GI, the hair may look very dark. GI is the proper way to correct this, but if GI must be really avoided, this multiplier can be used to brighten the hair.

Opaque For Shadows – When enabled, the hair material is always opaque for shadow calculations. This speeds up the rendering of transparent hair.

Opaque For GI – When enabled, the hair material is always opaque for GI calculations. This speeds up the rendering of transparent hair. *For more information, see the [Strand Taper vs Transparency Mapping example](#) below.*

Simplify for GI – When enabled, a simplified diffuse version of the BRDF is used for GI calculations. This may speed up the rendering of hair but may significantly change the final look.

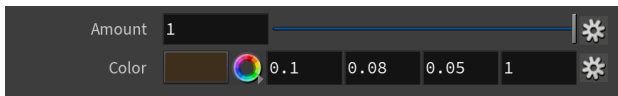
Use Cached GI – Similar to the **Use Irradiance Map** option for the [BRDFVRayMtl](#) material; if it is disabled, the hair material is always calculated with brute force GI. *For more information, see the [Effect of GI on Hair example](#) below.*



Diffuse

Amount – The amount for the diffuse component of the material.

Color – Controls the diffuse component of the shader. Use this for materials made out of cloth threads or other non-translucent fibers, as well as for dirty hair. Note that clean hair or fur *does not* normally have a diffuse component, so in that case leave the parameter black.

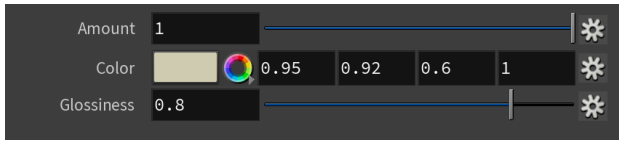


Primary Specular

Amount – A multiplier for the primary specular color.

Color – The primary specular color component, which corresponds to light that is reflected off the outer surface of hair strands (see the figure above). Normally this is dark gray.

Glossiness – The glossiness for the primary specular component. Values closer to 1.0 make the hair more shiny and sleek. Lower values give it a matted look.



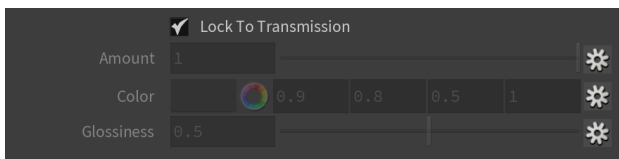
Secondary Specular

Lock To Transmission – When enabled (the default), the **Color** for the Secondary Specular component is derived from the color of the Transmission component. Since a ray of light goes twice through the hair width, the color of the secondary specular component can be computed by multiplying the transmission color with itself. When enabled, the hair color is mostly determined by the transmission color component.

Amount – A multiplier for the secondary specular component. If **Lock to Transmission** is enabled, this value is ignored and the secondary specular amount is derived from the transmission amount.

Color – The color of the secondary specular component, which corresponds to light that is reflected off the back surface of the hair strands. If **Lock To Transmission** is enabled, this value is ignored and the secondary specular color is derived from the **Transmission** color.

Glossiness – The glossiness for the secondary specular component. Values closer to *1.0* correspond to shiny and sleek hair. Lower values correspond to matted hair.



Transmission

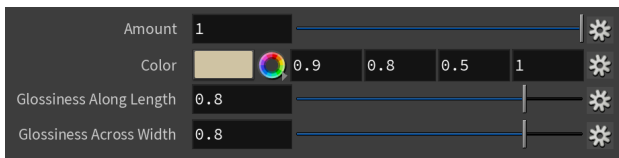
Amount – The amount of the transmission component.

Color – The color for the transmission component, which corresponds to light that goes through the hair strands. When **Lock To Transmission** is enabled, this color determines the overall hair color.

Glossiness Along Length – The glossiness of the transmission along the hair strand length. See the [Glossiness Along/Across Length and Width Parameters example](#) below for a demonstration of the effect of this parameter.

Glossiness Across Width – The glossiness for the transmission component across the hair strand width. For more information, see the [Glossiness Along /Across Length and Width Parameters example](#) below.

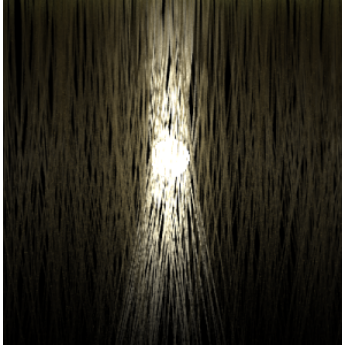
The transmission component of the Hair 3 material is stored in the Refraction render channel.



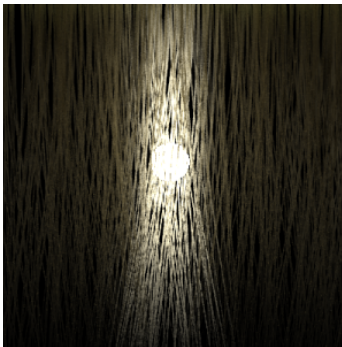
Example: Glossiness Along/Across Length and Width Parameters

This example shows the effect of the **Glossiness Along Length** and the **Glossiness Across Width** parameters. It shows a number of vertical strands (in this case, produced by V-Ray Fur) lit from behind by a spherical light.

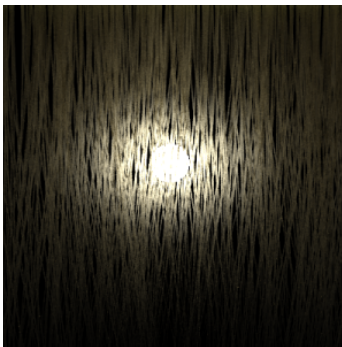
Note how each parameter changes the way light scatters along the length and the width of the strands. Higher values for the length glossiness compress the transmission highlight along the strand length, while lower values expand it.



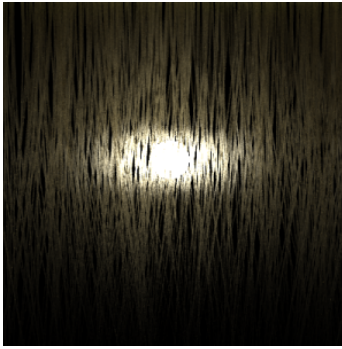
Length 0.87
Width 0.98



Length 0.85
Width 0.95



Length 0.95
Width 0.85



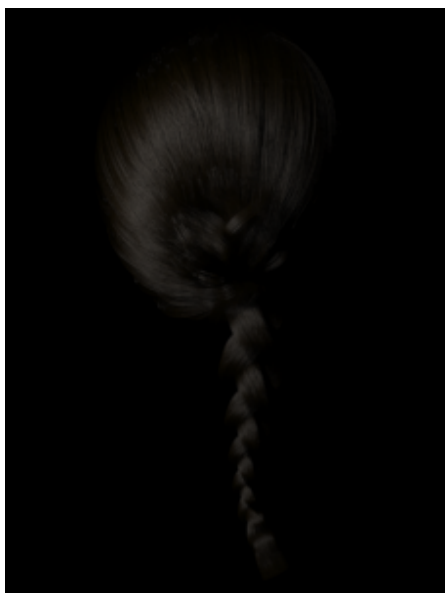
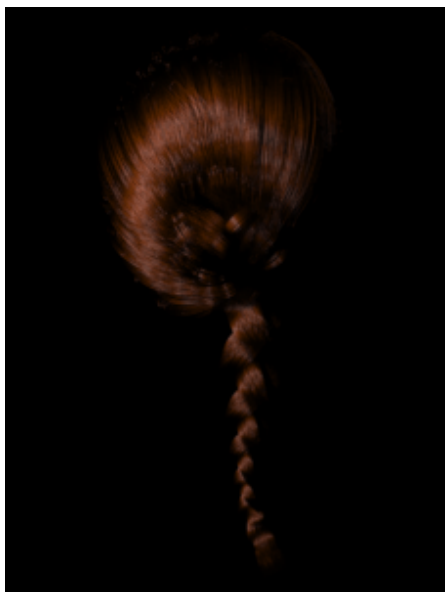
Length 0.98
Width 0.87

Example: Effect of GI on Hair

This example shows how important GI (multiple scattering) is for the appearance of hair, especially bright hair. The top row shows several of the presets rendered without GI, and the bottom shows the same scene when GI is enabled. Again, GI is brute force and light cache has retrace. The scene GI environment is black so that a spherical area light is the only light source.

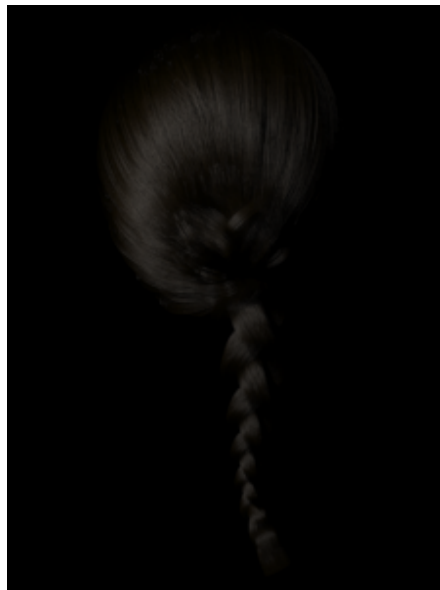
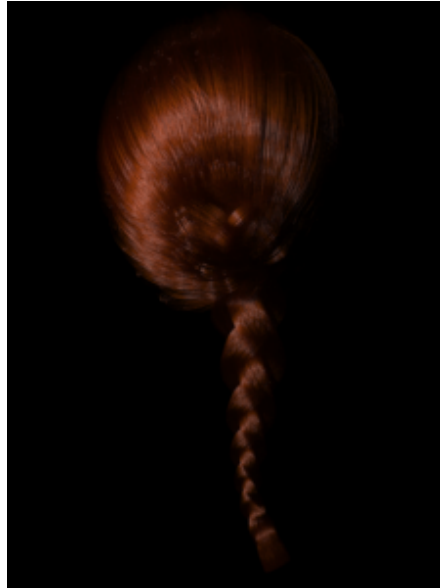
GI is **Disabled**





GI is Enabled



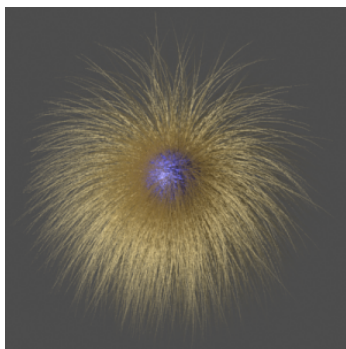


Example: Strand Taper vs Transparency Mapping

This example shows how transparency mapping can be used to simulate hair thinning towards the tips with improved quality. Since transparency also increases render times, the BRDFHair3 material provides two options to optimize this - the **Opaque For Shadows** and **Opaque For GI** options allow to skip the transparency calculations for shadow and GI rays, thus speeding up the rendering.

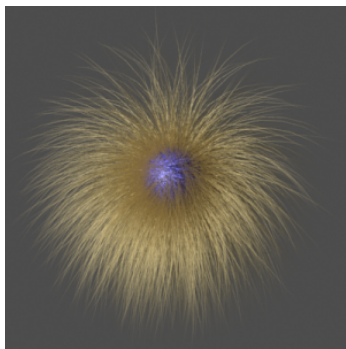
For the first image, the thinning of the strands towards the tips was done by setting the **Taper** parameter of V-Ray Fur to 1.0. The opacity of the hairs for the 2nd, 3rd and 4th image is done with the V-Ray Hair Sampler texture in the **Opacity** slot of the BRDFHair3 material, while keeping the **Taper** parameter in V-Ray Fur to 0.0. The scene is illuminated with one point light with sharp raytraced shadows to better show the difference between the options. Note how opacity mapping improves the anti-aliasing of the hair, while still preserving the same overall look, at the expense of somewhat increased render times. However, the first image also required increased AA samples compared to the rest.

Note that using transparency for the strands may require increasing of the **Max. Transp. Levels** option in the global V-Ray settings, although it was not necessary for this particular case.



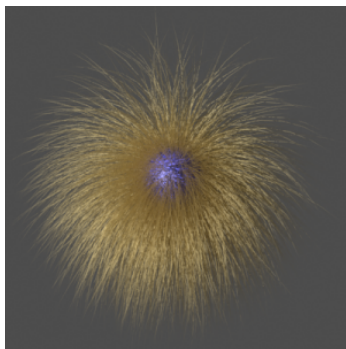
Hair geometry with taper

Render time: 1m 6s



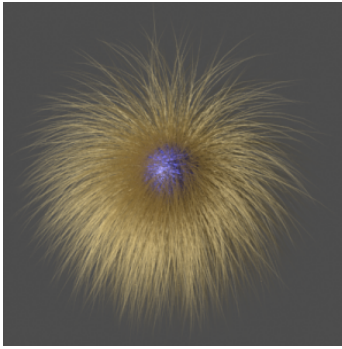
Hair geometry without taper, with
opacity mapping

Render time: 2m 14s



Hair geometry without taper, with
opacity mapping,
both **Opaque for Shadows** and
Opaque for GI enabled

Render time: 1m 46s



Hair geometry without taper, with
opacity mapping, **Opaque for GI** enabled

Render time: 1m 57s
