



MATERIAL TYPES



MATERIAL TYPES

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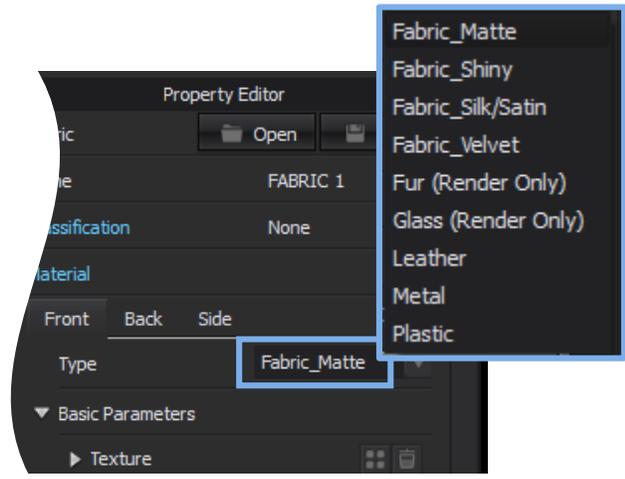
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GENERAL SETTINGS

Changing Material Type



Set the appropriate Type for the material.

Select the fabric and apply the appropriate Material Type in the Property Editor.

Changing the material type does not change the drape of the fabric. It is only a surface/rendering property.

Avatars, buttons, zippers, and topstitch properties can have these presets applied to them as well.

Examples:

General



Shiny



Leather



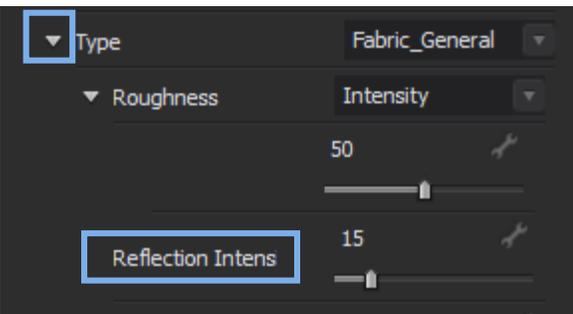
Metal



Plastic



Reflection Intensity



Reflection intensity increases the amount of light bouncing off the material.

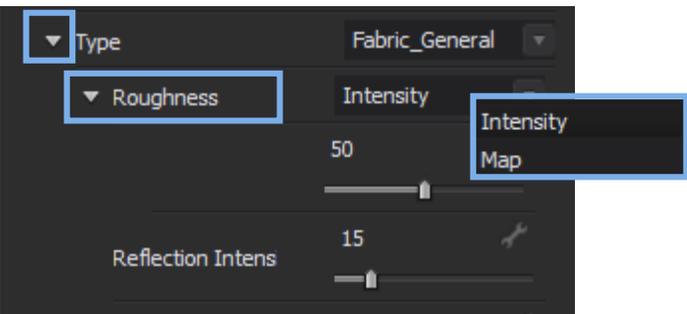
The example below demonstrates how the Reflection Intensity controls the reflectivity of the material. Note that this intensity acts as a white filter for the base color.

A material with higher reflection intensity reflects more light, so it looks white and blurry.



Base Color	40, 40, 40								
Roughness	100								
Reflection Intensity	0	Reflection Intensity	25	Reflection Intensity	50	Reflection Intensity	75	Reflection Intensity	100

Roughness



Roughness spreads the reflected light across the material's surface.

Roughness controls the sharpness of reflections. A lower value allows light to be reflected in a small area and a larger value allows light to be reflected in the whole object area.

The amount of roughness can be changed with the Intensity slider or a custom Roughness Map may be imported.



Base Color 40, 40, 40
 Roughness 0
 Reflection Intensity 50



Base Color 40, 40, 40
 Roughness 25
 Reflection Intensity 50



Base Color 40, 40, 40
 Roughness 50
 Reflection Intensity 50



Base Color 40, 40, 40
 Roughness 75
 Reflection Intensity 50

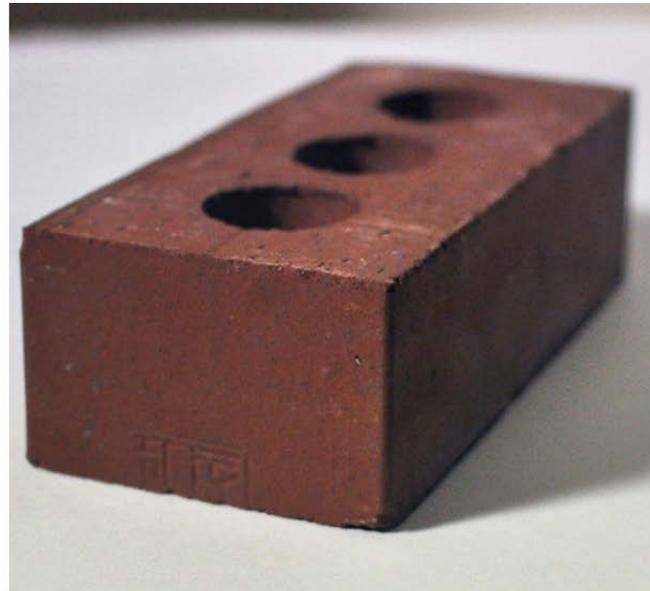


Base Color 40, 40, 40
 Roughness 100
 Reflection Intensity 50

Roughness



Small Roughness



Large Roughness

We can observe this phenomenon in everyday life.

The surface of the brick is very rough so there is no highlight, but the surface of the water bottle is smooth (opposite of rough) so there is a clear white highlight.

Normal Maps and Roughness

The middle and right image have the same parameters except for the Normal Map*, but the right image looks a bit more rough.

The Normal Map makes the surface of the object bumpy (=rough), so the highlights are reduced. Placing a Normal Map is similar to increasing roughness.

*Normal Maps are visual representations of the highs and lows of a texture, creating 3D dimensionality without adding additional geometry to the figure.



Roughness 100
Reflection Intensity 80



Roughness 20
Reflection Intensity 80



Roughness 20
Reflection Intensity 80

PRESET MATERIAL TYPES

Fabric Presets General (Matte), Shiny, Leather

Fabric_Shiny has a reflection intensity greater than Fabric_General, so there is a white tone on the surface of Fabric_Shiny. It's lower roughness (=30) also makes sharper highlights at the edge of the fabric.

The Leather preset applies an enhanced normal map. Leather and Fabric_General will not have the same results even if all the parameters are the same.



Fabric_General
Roughness 50
Reflection Intensity 15



Fabric_Shiny
Roughness 30
Reflection Intensity 40



Fabric_Leather
Roughness 30
Reflection Intensity 70
+Enhanced normal map

Fabric Presets Silk/Satin

Shiny silk is much more reflective than other fabrics.

The Silk/Satin preset has white automatically mixed in with the base color to create the high shine effect. Use the examples below to get a better idea of what Roughness and Reflection values will look like in the Silk/Satin settings.



Roughness 50
Reflect Intensity 15



Roughness 40
Reflect Intensity 30



Roughness 40
Reflect Intensity 45



Roughness 35
Reflect Intensity 60



Roughness 35
Reflect Intensity 75

Fabric Presets

Velvet

Velvet has a distinctive reflection—the side color is brighter than the front. To control this, use the Front and Side Color Multipliers. The higher the number, the darker the fabric is.

For a realistic velvet, set the Front Color to a low number (between 0.1 and 1) and the Side Color to a high number (between 1 and 20).

Using a Normal Map will also help give the velvet a more textural look. CLO's default Library has a Velvet fabric that can be used as a base to start with.



Front Colot Mult 1.0
Side Colot Mult 1.0



Front Colot Mult 1.0
Side Colot Mult 2.0



Front Colot Mult 1.0
Side Colot Mult 3.0



Front Colot Mult 1.0
Side Colot Mult 5.0



Front Colot Mult 0.5
Side Colot Mult 3.0

Metal and Plastic

The images below are the result of using only the Material Type and Color. We can use additional texture and roughness for more realistic results.



Color 218, 165, 32



Color 215, 211, 208



Color 49, 141, 178



Color 151, 151, 151



Color 217, 52, 128



Color 141, 196, 68



Color 253, 227, 6



Color 254, 126, 19

Glass (Render Only)

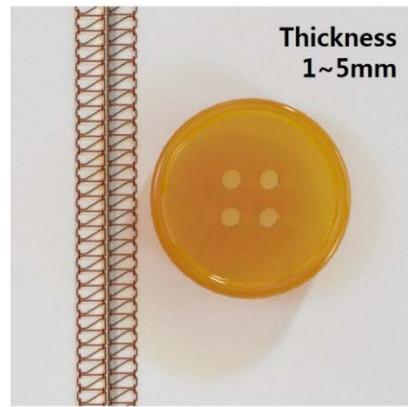
Glass is one of the hardest materials to control in V-Ray.

There are three characteristics of the material to consider: **Object Thickness**, **Material Color**, and **Absorption Rate**.

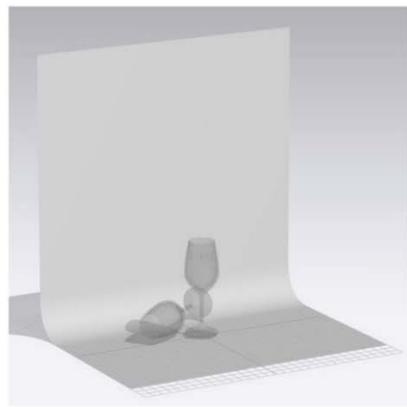
Absorption Rate – The amount of light that is absorbed by the glass (the light that isn't reflected and hasn't passed through the object). The more light that is absorbed, the darker and less transparent the glass becomes. If your object is as small as a button, absorption rate should be large. (1.0~20.0) (See right.) If your object is as large as a avatar, absorption rate should be small. (0.01~0.1)

How these characteristics interact (See Below):

- Even if blue is assigned to a wine glass, the wine glass doesn't automatically become blue.
- The results will vary depending on how thick the glass is and how much light it can absorb (Absorption Rate).
- Thick glass is darker than thin glass, and as the absorption rate increases, the glass becomes dark.
- Note that the lower the absorption rate, the brighter the wine glass.



Stitch-Absorptance 20.0
Button-Absorptance 1.0



Absorptance 2.0



Absorptance 1.0



Absorptance 0.75



Absorptance 0.5



Absorptance 0.1

NEW MATERIALS (CLO 4.2)

Fur (Render Only)

Parameters

Fur is based on the physiology of real hair. These parameters are in line with the V-Ray hair settings found here: <https://docs.chaosgroup.com/display/VRAY4MAX/VRayHairNextMtl>

Vocabulary Terms:

Fur Parameters

- **Melanin** – The natural pigmentation found in human/animal skin and hair. The higher the level of melanin, the darker the hair.
- **Pheomelanin** – Pheomelanin adds red tones to the coloring.
- **Glossiness, Glossiness Boost, Softness** – These parameters control how shiny the hair is.

Fur Shape

- **Base** – Adjust the overall shape of each strand of hair (length, thickness, bend, taper, density, segments).
- **Variance** – Add variety and randomness to the shaping of each strand.
- **Curl** – Adjust how straight each strand of hair is.

Tips before starting:

1. Rendering fur requires a lot of computer resources, so try to keep fur only on the most crucial parts of the garment.
2. Generally, it is not necessary to have fur on all sides of a garment, so be careful to not create fur on all 3 faces of the fabric.
3. Do not increase the density more than necessary. Set density to be smaller than in reality and thickness to be larger than usual.



Fur (Render Only)

Coloring

The color of the fur is controlled by the base Color, Melanin, and Pheomelanin parameters.

Melanin – The natural pigmentation found in human/animal skin and hair.

The higher the level of melanin, the closer the coloration is to black.

- Melanin Values:
- 0 = White
- 0.1-0.2 = Blonde
- 0.3-0.4 = Tan
- 0.5-0.8 = Brown
- 1 = Black



Melanin 0
Pheomelanin 0



Melanin 0.25
Pheomelanin 0



Melanin 0.5
Pheomelanin 0



Melanin 0.75
Pheomelanin 0



Melanin 1.0
Pheomelanin 0

Pheomelanin – Pheomelanin adds red tones to hair coloring.

The ratio of melanin to pheomelanin determines how red the fur is. The pheomelanin amount will have no effect if the melanin is set to 0.



Melanin 0.4
Pheomelanin 0



Melanin 0.4
Pheomelanin 0.25



Melanin 0.4
Pheomelanin 0.5



Melanin 0.4
Pheomelanin 0.75



Melanin 0.4
Pheomelanin 1.0

Fur (Render Only)

Coloring

So you want to create dyed hair. To get the correct colors, you just need to think like a hair stylist. For example, to dye hair blue, you first have to remove the color by bleaching it white and then apply blue dye.

To do this in the material, **turn the Melanin levels down to 0** and then change the base color or texture as needed. The examples below all have Melanin and Pheomelanin set to 0, and a texture was used to create gradient and spot colors.



Fur (Render Only)

Shininess

The amount of shine can be adjusted with the Glossiness, Glossiness Boost, and Softness parameters.



Glossiness Boost 0.25
Glossiness 0.6
Softness 0.4



Glossiness Boost 0.75
Glossiness 0.6
Softness 0.4



Softness 0.25
Glossiness 0.75
Glossiness Boost 0.5



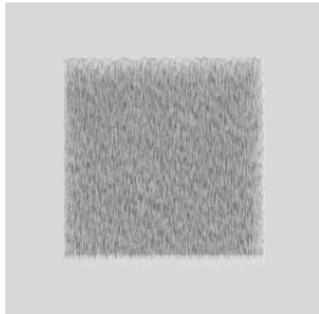
Softness 0.75
Glossiness 0.75
Glossiness Boost 0.5

Fur (Render Only) Strand Shape 1

Length - Configure the length of the fur. Higher the value is, longer the fur is.

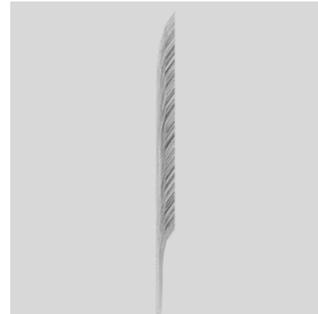


Length: 50



Length: 10

Bend - Configure the bending strength of the fur. The higher the value, the heavier the hair.

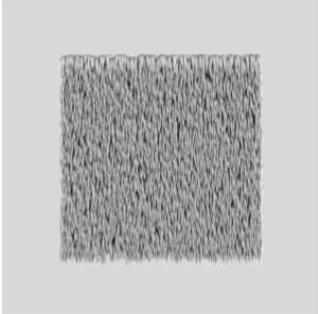


Bend: 1.00

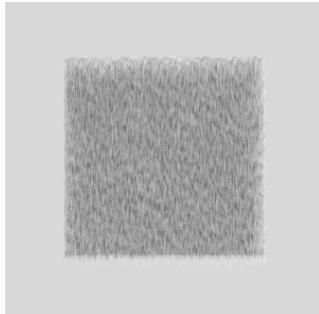


Bend: 0.20

Thickness - Configure the thickness of the strand. The higher the value, the thicker the hair.

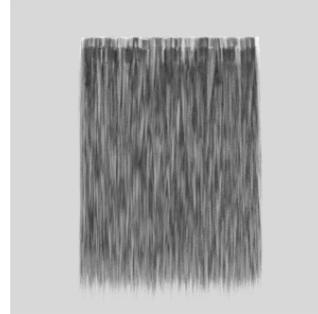


Thickness: 10



Thickness: 0.20

Taper - Differentiate the thickness of the fur between its root and the end.



Taper: 1.00
(Thickness: 2)

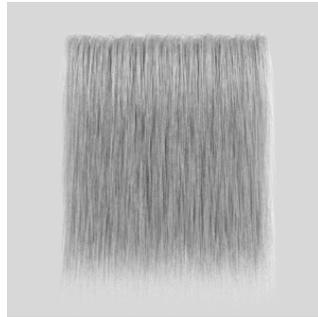


Taper: 0
(Thickness: 2)

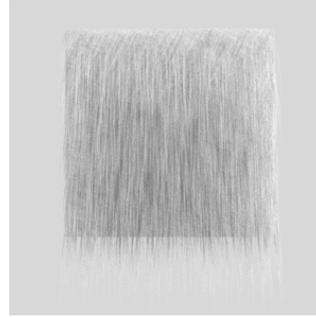
Fur (Render Only)

Strand Shape 2

Density - Configure close each strand is placed. The higher the value is, the denser the fur is.



Density: 1.00

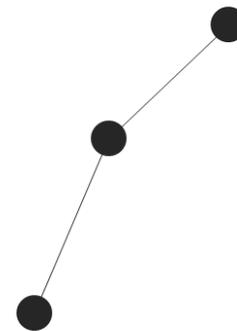


Density: 0.20

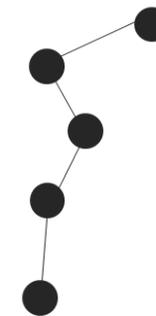
Segments – Fur is rendered as several straight segments connected together. Configure how many sections a single thread of fur is divided into.

When the fur is long and has higher Bending value, the fur must have higher Segments value to express the Bending smoothly and realistically. However, for the short and straight fur, the Segments value is not as significant.

Generally, 8 is enough, but there can be up to 16 segments.



Segment 2



Segment 4

Fur (Render Only)

Variance & Curliness

Variance – Variance adds randomness to the shaping of each strand. The parameters include Length, Thickness, and bend Direction.

Values range from 0.0 (no variation) to 1.0.

Curl – Configure how straight the hair strands are. The Radius decides the size of the curl and the Number determines how many curls each strand has.



Curl Number 1
Curl Radius 5



Curl Number 2
Curl Radius 5



Curl Radius 2
Curl Number 1



Curl Radius 10
Curl Number 1



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