



## 26.15 Editors - Properties Editor - Material Properties Tab

### Table of content

Detailed table of content.....	1
Preface.....	6
Material header.....	6
Preview Panel.....	10
Surface Panel.....	11
Surface Panel - Grease Pencil Object.....	12
Volume Panel.....	17
Displacement Panel.....	17
Settings Panel - Eevee renderer.....	18
Settings Panel - Cycles renderer.....	19
Line Art.....	20
Viewport Display.....	21
Custom Properties panel.....	23

### Detailed table of content

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Detailed table of content.....	1
Preface.....	6
Affected Renderer.....	6
Material header.....	6
Material List.....	7
Show in ghosts.....	7
Hide.....	7
Locked.....	7
Drag Handler.....	7
Search Field.....	7
Sort by Name.....	7
Reverse.....	7
Add Material Slot.....	7
Remove Material Slot.....	7
Materials Specials menu.....	8
With a mesh or curve or other object type.....	8
Copy Material.....	8
Copy Material to selected.....	8
Paste Material.....	8
Remove Unused Slots.....	8
With a grease pencil stroke object.....	8
Show All.....	8
Hide Others.....	8
Lock All.....	8
Unlock All.....	8
Lock Unused.....	8
Remove Unused Slots.....	8

Merge Similar.....	8
Convert Materials to Vertex Colors.....	8
Extract Palette from Vertex Color.....	9
Append Active Layer to Object.....	9
Append all Layers to Object.....	9
Material data property.....	9
Material Browser.....	9
New.....	9
Name.....	9
Fake User.....	9
New.....	9
Remove.....	9
Link.....	9
Right Click menus.....	9
Edit Mode.....	10
Workflow.....	10
Assign.....	10
Select.....	10
Deselect.....	10
Preview Panel.....	10
Flat, Sphere, Cube, etc.....	10
Preview World.....	10
Surface Panel.....	11
Use Nodes.....	11
Use Nodes unticked with Eevee.....	11
Use Nodes unticked with Cycles.....	11
Use Nodes ticked.....	11
Surface Panel - Grease Pencil Object.....	12
Presets.....	12
Stroke Subpanel.....	12
Mode Type.....	12
Mode Type Line.....	12
Style.....	12
Solid.....	12
Base Color.....	12
Texture.....	12
Base Color.....	12
Image Prop.....	12
Image browser.....	13
Search form.....	13
Image Edit Box.....	13
Number of Fake Users.....	13
Fake User.....	13
Open.....	13
Remove.....	13
Self Overlap.....	13
Holdout.....	13
Mode Type Dots + Squares.....	13
Style.....	13
Solid.....	13
Base Color.....	13
Texture.....	14
Base Color.....	14

Image Prop.....	14
Image browser.....	14
Search form.....	14
Image Edit Box.....	14
Number of Fake Users.....	14
Fake User.....	14
Open.....	14
Remove.....	14
Alignment.....	14
Path.....	14
Object.....	14
Fixed.....	14
Self Overlap.....	15
Rotation.....	15
Holdout.....	15
Fill Subpanel.....	15
Style.....	15
Solid.....	15
Base Color.....	15
Holdout.....	15
Gradient.....	15
Gradient Type.....	15
Base Color.....	15
Secondary Color.....	15
Blend.....	15
Flip Colors.....	15
Location X / Y.....	15
Rotation.....	16
Scale X / Y.....	16
Holdout.....	16
Texture.....	16
Base Color.....	16
Image Prop.....	16
Image browser.....	16
Search form.....	16
Image Edit Box.....	16
Number of Fake Users.....	16
Fake User.....	16
Open.....	17
Remove.....	17
Location X / Y.....	17
Rotation.....	17
Scale X / Y.....	17
Clip Image.....	17
Holdout.....	17
Volume Panel.....	17
Use Nodes.....	17
Displacement Panel.....	17
Use Nodes.....	17
Settings Panel - Eevee renderer.....	18
Pass Index.....	18
Surface subpanel.....	18
Backface Culling.....	18

Camera.....	18
Shadow.....	18
Max displacement.....	18
Transparent Shadows.....	18
Render method.....	18
Dithered.....	18
Raytraced refraction.....	18
Blended.....	19
Transparency Overlap.....	19
Light Probe Volume.....	19
Single Sided.....	19
Volume subpanel.....	19
Intersection.....	19
Fast.....	19
Accurate.....	19
Settings Panel - Cycles renderer.....	19
Pass Index.....	19
Surface.....	19
Multiple Importance.....	19
Transparent Shadows.....	19
Displacement.....	20
Volume.....	20
Sampling.....	20
Interpolation.....	20
Homogeneous.....	20
Step rate.....	20
Line Art.....	20
Material Mask.....	20
Levels.....	20
Intersection Priority.....	20
Intersection Priority Value.....	20
Viewport Display.....	21
Settings.....	21
Backface Culling.....	21
Blend Mode.....	21
Opaque.....	21
Alpha Clip.....	21
Clip threshold.....	21
Alpha Hashed.....	21
Alpha Blend.....	22
Shadow Mode.....	22
None.....	22
Opaque.....	22
Alpha Clip.....	22
Clip threshold.....	22
Alpha Hashed.....	22
Show Backface.....	22
Screen Space Refraction.....	22
Refraction depth.....	22
Subsurface Translucency.....	22
Pass Index.....	22
Custom Properties panel.....	23
Add.....	23

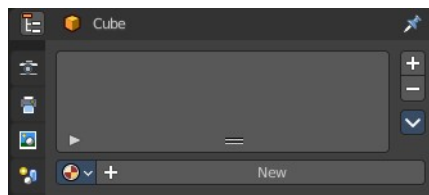
Property Value.....23

Edit.....23

Remove.....23

## Preface

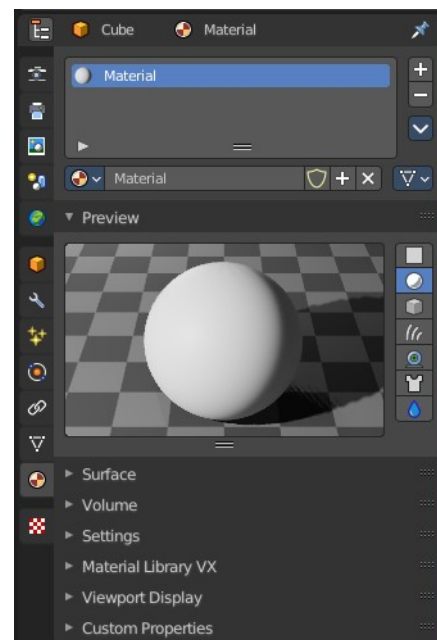
Materials controls the appearance of meshes, curves, volumes and other objects.



A material is the container that contains all the necessary data to define the look of an object. It is made of a code part, the shaders. They control how the surface reacts. And color data like textures. A black and white texture can also control what areas of a shader reacts in what way. Like a gloss map.

Materials can be created in either the Material properties, or in the Shader Editor. The content that is displayed is the same. But the way how it is represented is different.

Materials can be assigned to one or more objects, and different materials can be assigned to different parts of meshes.



The material system is built with physically-based rendering in mind. But can also be used to create toon style materials.

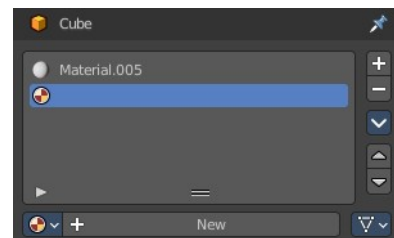
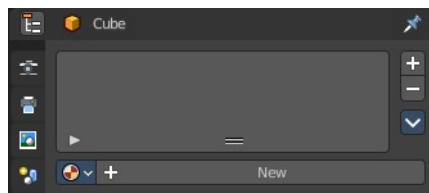
## Affected Renderer

The material system is for Eevee and Cycles. Workbench renderer is meant for fast preview display. It does not use materials like Eevee or Cycles. All you can choose is a color.

Eevee and Cycles have nearly the same nodes available. But some nodes differ. Eevee is a realtime renderer. Cycles is a physically based render. That's two different approaches. So you should take that into account when creating the materials.

## Material header

The header area contains the list of materials and the functionality to create new materials and to remove them.

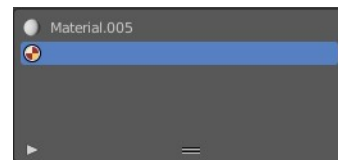


Note that a material for a grease pencil object differs from the rest. It is basically the same. But grease pencil objects have other icons in the material browser.



## Material List

The list of assigned materials to this object. The list shows the material slots. A material slot that has the red material icon assigned has no material content yet. It is just an empty slot. You have to create it first by clicking at the New button below, in the material property.

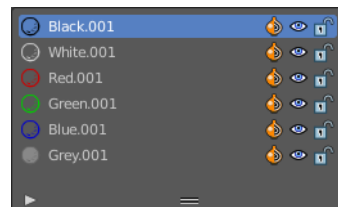


Clicking at the name allows renaming of the material.

Grease pencil materials have additional functionality in the list.

## Show in ghosts

Turn on onion skinning for this material. Onion skinning displays strokes before and after the current frame.



## Hide

Show or hide the material.

## Locked

Protect color from further editing.

## Drag Handler

The two vertical lines at the end is a handler with which you can expand the list.

## Search Field

You can expand a search field at the bottom of the list. Type in your term and hit enter to filter for your term.



## Sort by Name

Sort the List by name.

## Reverse

Exclude the search term instead of searching for it.

## Add Material Slot

Add a new material slot

## Remove Material Slot

Remove the selected material slot.

## Materials Specials menu

### With a mesh or curve or other object type

#### ***Copy Material***

Copy the material settings and nodes.

#### ***Copy Material to selected***

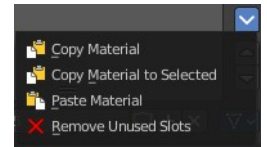
Copy material to selected objects. First select the object without material. Hold down shift and select the object with material. Perform Copy material to selected.

#### ***Paste Material***

Pastes a copied material.

#### ***Remove Unused Slots***

Remove material slots that does not contain a material.



### With a grease pencil stroke object

#### ***Show All***

Show all materials.

#### ***Hide Others***

Hide unselected materials.

#### ***Lock All***

Lock all materials from editing.

#### ***Unlock All***

Unlock all materials.

#### ***Lock Unused***

Lock unused materials from editing.

#### ***Remove Unused Slots***

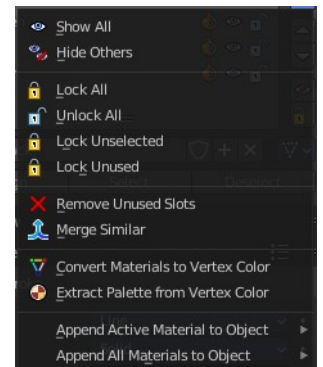
Remove material slots that does not contain a material.

#### ***Merge Similar***

Merge similar materials in stroke.

#### ***Convert Materials to Vertex Colors***

Grease pencil strokes can have either vertex colors or material colors. This feature converts the selected materials to a vertex color palette.





## ***Extract Palette from Vertex Color***

Grease pencil strokes can have either vertex colors or material colors. This feature converts a vertex color palette to materials.

## **Append Active Layer to Object**

Appends the active layer to an object.

## **Append all Layers to Object**

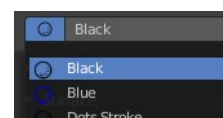
Appends all layer to an object.

## **Material data property**



## **Material Browser**

A list of the available materials in the scene where you can choose a material from.



## **New**

When the object has no material yet. Creates a new default material and adds a first material slot to the list.



## **Name**

The name of the active material. Double clicking allows to rename it.

## **Fake User**

Keep this data even when it has no user in the scene.

## **New**

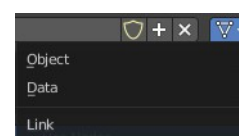
Creates a new default material, and assigns it to the active material slot.

## **Remove**

## **Link**

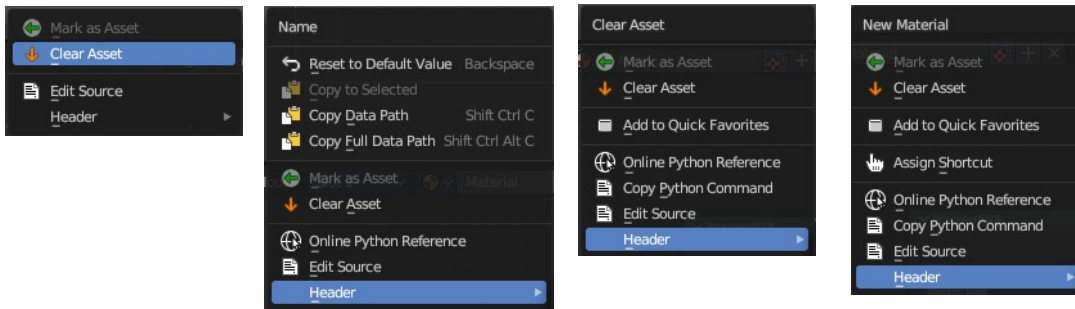
Specifies whether the material is to be linked to the Object or to the Object Data.

Different objects may share the same mesh data. And if the material is linked to the mesh, every object will share it. If the material is linked directly to the object data, the objects can have different materials and still share the same mesh. Default is Data.



## **Right Click menus**

When you right click at the material property then you will reveal context menus with different content, dependant of where you click. Most of the content is explained in chapter 6, the general right click menu functionality. The rest should be self explaining.



## Edit Mode

In Edit mode you can assign different materials at different mesh or curve parts.

## Workflow

Enter Edit Mode. Select the material that you want to assign. Select the mesh or curve part. Click at the assign button.

## Assign

Assign active material slot and material to the selected faces in the mesh, strokes in a Grease Pencil, and similar for other object types.

## Select

Select faces assigned to the active material slot.

## Deselect

Deselect faces assigned to the active material slot.

## Preview Panel

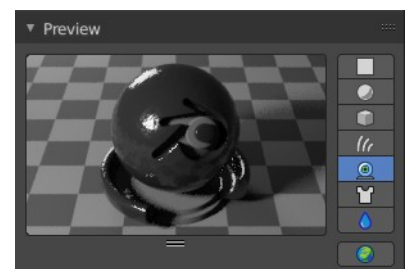
A preview window to judge the material.

## Flat, Sphere, Cube, etc.

Different shaped preview objects.

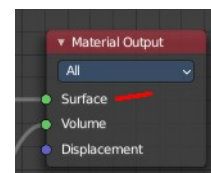
## Preview World

Include the world settings into the preview rendering.



## Surface Panel

This panel displays the Surface part of the material as a list. And allows you to edit its values.



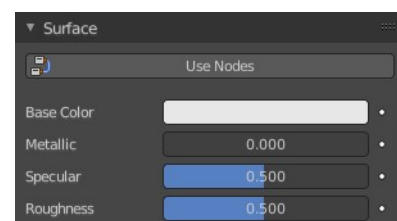
### Use Nodes

Choose if you want to use nodes or not. Unticked it will use a default material with just basic values. Ticked it will use the material as defined in the shader editor in the Shading workspace. And display its values.

The values with unticked Use Nodes will not appear in the material node editor.

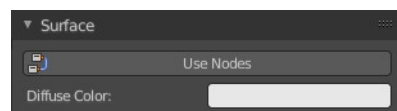
### Use Nodes unticked with Eevee

Gives you the values for a very basic PBR realtime shader.



### Use Nodes unticked with Cycles

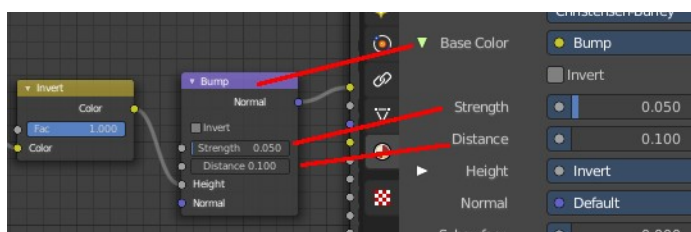
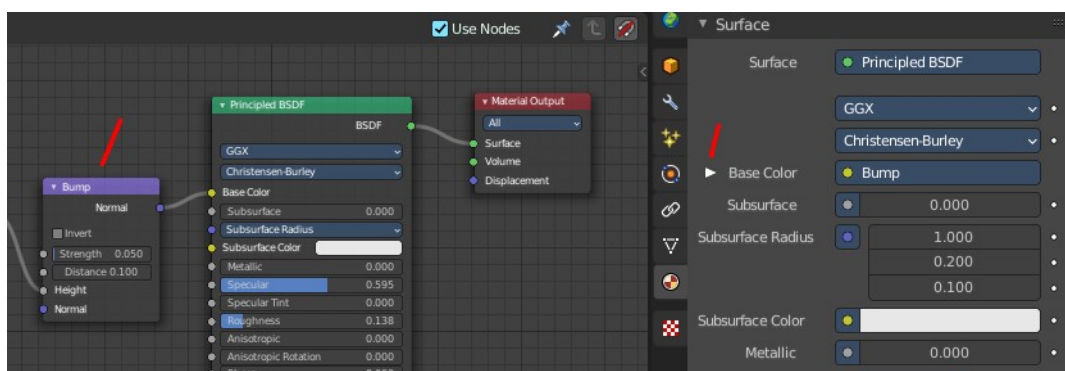
Gives you a base color.



### Use Nodes ticked

Displays the content of the material in the shader editor as a list.

Triangle buttons indicates that there is a node connected to this input. You can expand this triangle to access the values of the connected node.



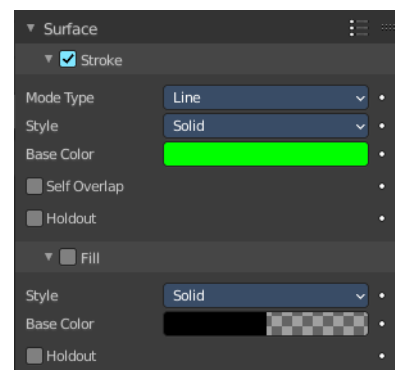
For the nodes and the values please have a look in the shader editor.

## Surface Panel - Grease Pencil Object

The content of the surface panel with a grease pencil object is a bit different from other object types since Grease pencil objects uses materials for the drawing color.

### Presets

The presets in the header allows you to use and store presets.

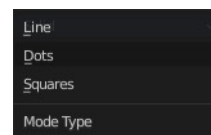


### Stroke Subpanel

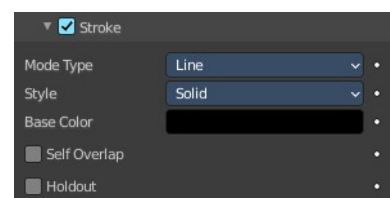
Stroke related settings.

#### Mode Type

The draw mode for the stroke. The modes should be self explaining. Most settings are the same in all modes.

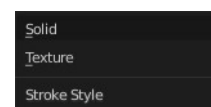


#### Mode Type Line



#### Style

The draw style.



#### Solid

##### Base Color

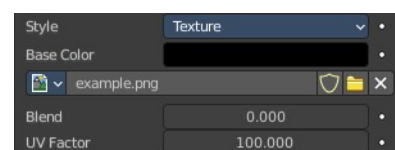
The color of the stroke.



#### Texture

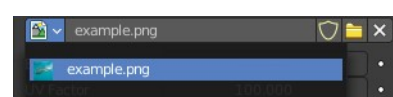
##### Base Color

The base color of the stroke. You can blend the texture with this color.



#### Image Prop

This property contains the list of loaded images. When no image is loaded then it displays the Open Buttons. When an image exists then it displays the name of the currently selected image.



From left to right ...

### ***Image browser***

This is a list of the images in the scene. This list allows you to switch to other images.

### ***Search form***

Search for specific images.

### ***Image Edit Box***

Read the name of the currently selected image. And you can rename the image here too.

### ***Number of Fake Users***

In case this file has a fake user assigned, then this number displays the number of fake users.

### ***Fake User***

Wit this button you assign a fake user to this selected image.

Data, like images, that is not longer linked to anything else gets removed when you save and reload a scene. Bforartists has the concept of fake users to go around this behavior. An image with a fake user is in fact linked to something. And so it is not lost when you save and reload the scene.

### ***Open***

Open a new image.

### ***Remove***

Removes the image.

### ***Self Overlap***

Disable stencil and allow self intersections with alpha materials.

### ***Holdout***

Remove the color from underneath this stroke by using the stroke as a mask.

## ***Mode Type Dots + Squares***

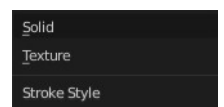
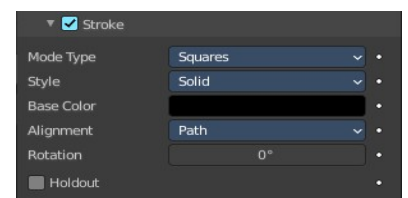
### ***Style***

The draw style.

### ***Solid***

### ***Base Color***

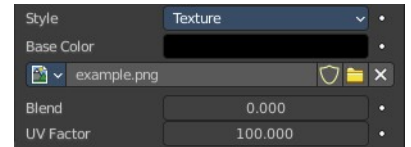
The color of the stroke.



## Texture

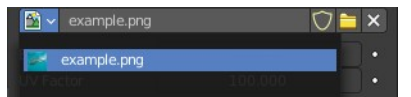
### Base Color

The base color of the stroke. You can blend the texture with this color.



### Image Prop

This property contains the list of loaded images. When no image is loaded then it displays the Open Buttons. When an image exists then it displays the name of the currently selected image.



From left to right ...

### Image browser

This is a list of the images in the scene. This list allows you to switch to other images.

### Search form

Search for specific images.

### Image Edit Box

Read the name of the currently selected image. And you can rename the image here too.

### Number of Fake Users

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### Fake User

With this button you assign a fake user to this selected image.

Data, like images, that is not longer linked to anything else gets removed when you save and reload a scene. Bforartists has the concept of fake users to go around this behavior. An image with a fake user is in fact linked to something. And so it is not lost when you save and reload the scene.

### Open

Open a new image.

### Remove

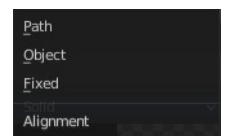
Removes the image.

### Alignment

Dots and Squares mode.

### Path

Alignment follows stroke drawing path and object rotation.



### Object

Alignment follows object rotation only.

### Fixed

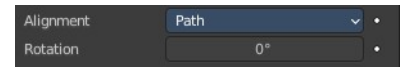
Keeps aligned with viewport.

## Self Overlap

Disable stencil and allow self intersections with alpha materials.

## Rotation

Additional rotation applied to dot and square strokes.



## Holdout

Remove the color from underneath this stroke by using the stroke as a mask.

## Fill Subpanel

Fill color related settings.

## Style

### *Solid*

### Base Color

The color of the stroke.



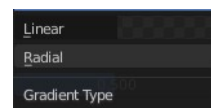
### Holdout

Remove the color from underneath this stroke by using the stroke as a mask.

## Gradient

### Gradient Type

Draw a linear or a radial gradient.



### Base Color

The first color of the gradient.

### Secondary Color

The second color of the gradient.

### Blend

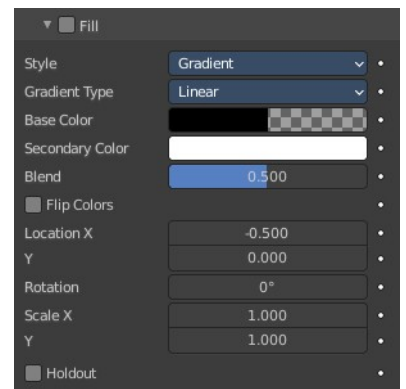
The mix factor between the first and second gradient color.

### Flip Colors

Flip the filling colors.

### Location X / Y

The location of the gradient.



## Rotation

The rotation of the gradient.

## Scale X / Y

The scale of the gradient.

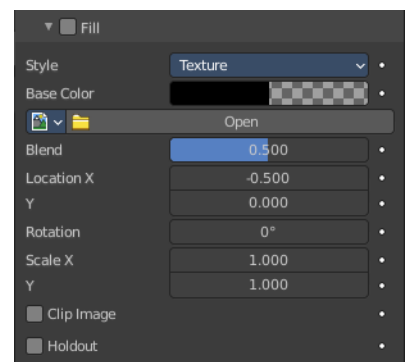
## Holdout

Remove the color from underneath this stroke by using the stroke as a mask.

## Texture

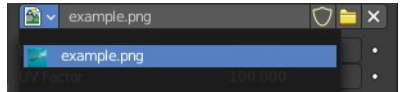
### *Base Color*

The base color of the stroke. You can blend the texture with this color.



### *Image Prop*

This property contains the list of loaded images. When no image is loaded then it displays the Open Buttons. When an image exists then it displays the name of the currently selected image.



From left to right ...

### **Image browser**

This is a list of the images in the scene. This list allows you to switch to other images.

### *Search form*

Search for specific images.

### **Image Edit Box**

Read the name of the currently selected image. And you can rename the image here too.

### **Number of Fake Users**

In case this file has a fake user assigned, then this number displays the number of fake users.

### **Fake User**

With this button you assign a fake user to this selected image.

Data, like images, that is not longer linked to anything else gets removed when you save and reload a scene. Bforartists has the concept of fake users to go around this behavior. An image with a fake user is in fact linked to something. And so it is not lost when you save and reload the scene.



## Open

Open a new image.

## Remove

Removes the image.

## Location X / Y

The location of the image.

## Rotation

The rotation of the image.

## Scale X / Y

The scale of the image.

## Clip Image

Do not repeat the image, but clamp it to one instance.

## Holdout

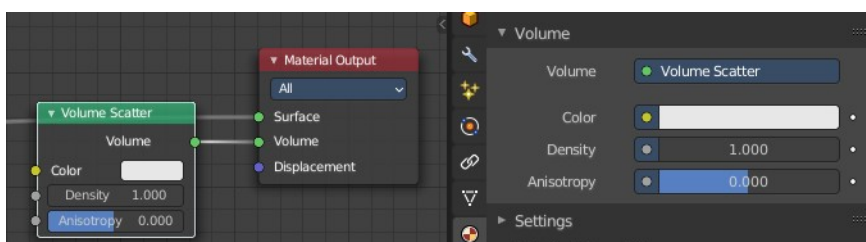
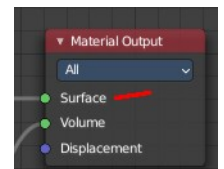
Remove the color from underneath this stroke by using the stroke as a mask.

# Volume Panel

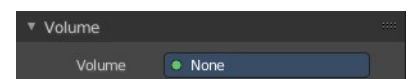
This panel displays the Volume part of the material as a list. And allows you to edit its values.

## Use Nodes

Choose if you want to use a volume node or not.



Removing the volume node in the shader editor will clear the volume panel.

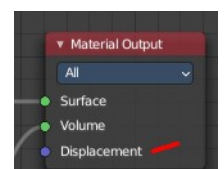


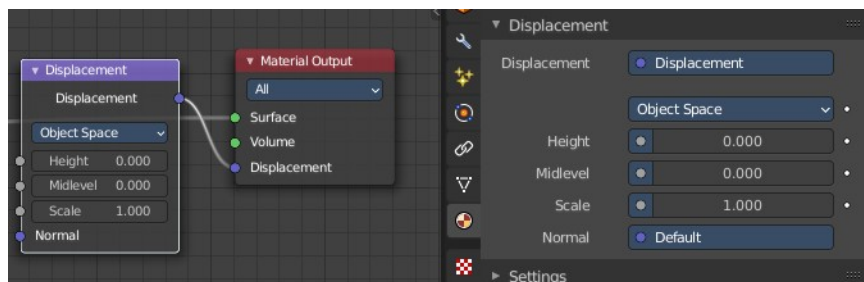
# Displacement Panel

This panel displays the Displacement part of the material as a list. And allows you to edit its values.

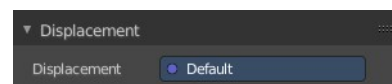
## Use Nodes

Choose if you want to use a displacement node or not.





Removing the displacement node in the shader editor will clear the panel.



## Settings Panel - Eevee renderer

### Pass Index

Index number for the material index pass.

### Surface subpanel

#### Backface Culling

##### Camera

Use back face culling to hide the back side of faces.

##### Shadow

Use back face culling when casting shadows.

### Max displacement

The maximum distance that a vertex can be displaced. Displacement over this threshold may cause visibility issues.

### Transparent Shadows

Use transparent shadows for this material.

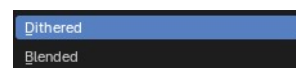
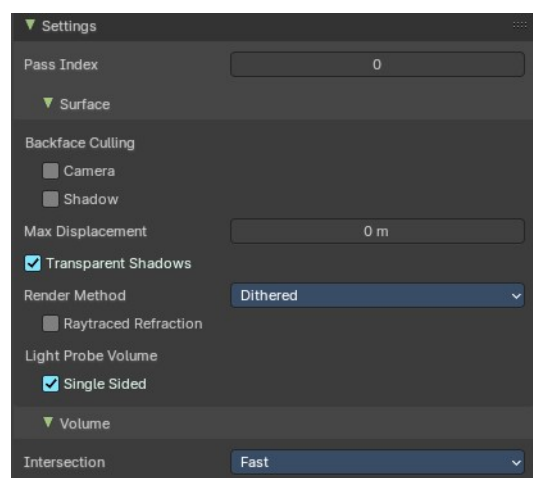
### Render method

#### Dithered

Allows for grayscale hashed transparency, and is compatible with render passes and raytracing. This is also known as deferred rendering.

#### Raytraced refraction

Use raytracing to determine refracted color instead of using only light probes. This prevents the surface from contributing to the lighting of surfaces not using this setting.



## ***Blended***

Allows for colored transparency, but is incompatible with render passes and raytracing. This is also known as forward rendering.

## **Transparency Overlap**

Render multiple transparent layers. Note that this may introduce transparency sorting problems.

## **Light Probe Volume**

### ***Single Sided***

Consider materials single sided for light probe volume capture.

## **Volume subpanel**

### **Intersection**

#### ***Fast***

Each face is considered as a medium interface. It gives correct results for manifold geometry that contains no inner parts.

#### ***Accurate***

Faces are considered as a medium interface only when they have different consecutive facing. It gives correct results as long as the max ray depth is not exceeded. This method also has a significant higher memory requirement.

## **Settings Panel - Cycles renderer**

Material settings.

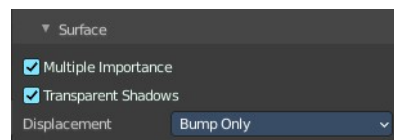
### **Pass Index**

The index number of this material. This material index can be used for masking in post processing for example.



### **Surface**

Surface related settings.



### **Multiple Importance**

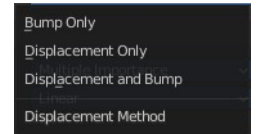
By default lights use only direct light sampling. Which can be noisy with sharp glossy reflections. Multiple Importance activates Indirect light sampling to reduce noise.

### **Transparent Shadows**

Use transparent shadows if the material contains a transparent bsdf node.

## Displacement

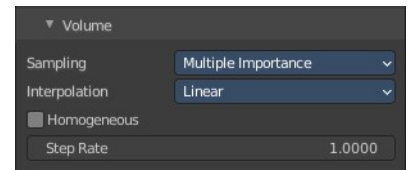
What method to use for displacement.



## Volume

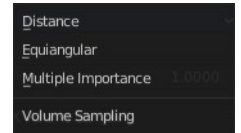
### Sampling

What sampling method to use for volume rendering.



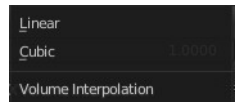
### Interpolation

What interpolation method to use for volume rendering.



## Homogeneous

Assume to have a homogeneous volume to speed up rendering.



### Step rate

Scale the distance between volume shader samples when rendering the volume. Lower values increases accuracy and render time.

Step rate becomes dysfunctional when Homogeneous is activated.

## Line Art

### Material Mask

Use material masks to filter out occluded strokes. You can filter out up to eight mask bits. The index starts with 0.

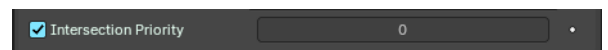


### Levels

Faces with this material will behave as if it has set nubmers of layers in occlusion.

### Intersection Priority

Overwrite object and collection priority value.



### Intersection Priority Value

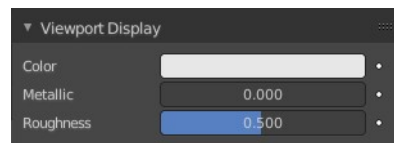
The intersection line will be included into the object with the higher intersection priority value.

## Viewport Display

Display settings for viewport display mode Solid. The items should be self explaining.

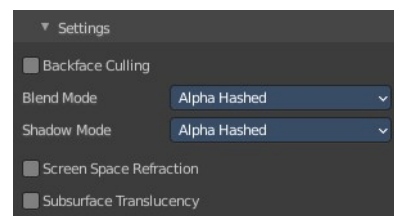
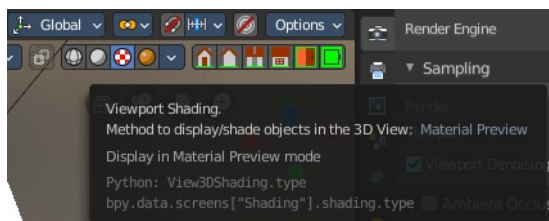
In solid mode the material colors are not displayed. With the viewport display color you can change this, and give each material its own color. Which can be any color, not necessarily the color from the material. Each material can have its own viewport display color.

Note that the Workbench renderer does not use materials and its colors at all. It relies completely at the viewport display color, even for rendering. But you can also here use different materials to have different colors at the mesh.



## Settings

Cycles only. And with Cycles these settings are just relevant for the viewport rendering in Material Preview mode. That's why they are in the viewport display panel.

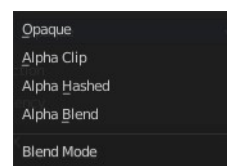


## Backface Culling

Use back face culling to hide the back side of faces.

## Blend Mode

The blend mode for transparent faces.

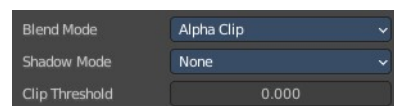


### Opaque

Render surface without transparency.

### Alpha Clip

Use the alpha threshold to clip the visibility. On or off.



### *Clip threshold*

A pixel is just rendered if the value is higher than this clip threshold. This threshold is the same for blend mode and shadow mode.

### Alpha Hashed

Use Noise to dither the binary visibility. Works best with multi samples.

## Alpha Blend

Render polygons transparent, dependent of the alpha channel of the texture.

## Shadow Mode

### None

Material will cast no shadow.

### Opaque

Material will cast shadow without transparency.

### Alpha Clip

Use the alpha threshold to clip the visibility. On or off.

#### *Clip threshold*

A pixel is just rendered if the value is higher than this clip threshold. This threshold is the same for blend mode and shadow mode.

### Alpha Hashed

Use Noise to dither the binary visibility.

## Show Backface

With Blend Mode Alpha Blend. Limit the transparency to a single layer to avoid transparency layer sort problems.

## Screen Space Refraction

Use ray traced screen space refraction.

### Refraction depth

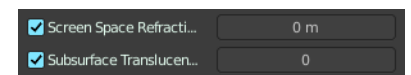
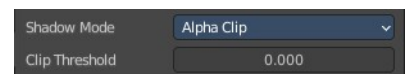
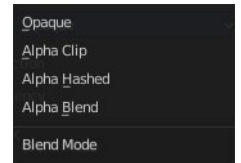
The thickness of the object to compute two refraction event. 0 means disabled.

## Subsurface Translucency

Add translucency effect to subsurface.

### Pass Index

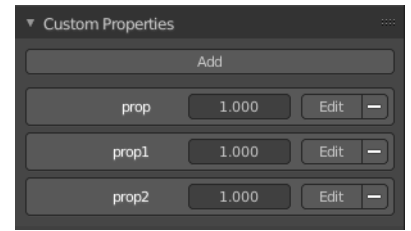
Index number for the material index render pass.



## Custom Properties panel

This panel exists for all object types in the Object Data Properties. Allows you to add custom properties that can be used in various ways then. For scripting, or to drive animation etc.

In this panel you might also find custom properties from addons or scripts.



### Add

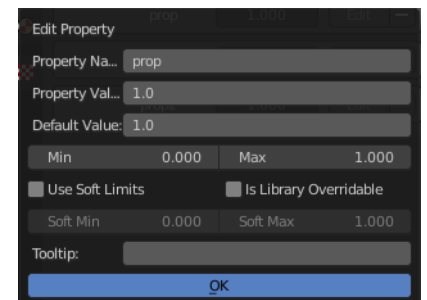
Adds a new property.

### Property Value

The value of the property.

### Edit

Opens a panel where you can adjust the settings for the custom property. The settings should be self explaining.



### Remove

Removes the property.