



## 13.1.6 Editors - Shader Editor - Header - Add Menu - Input

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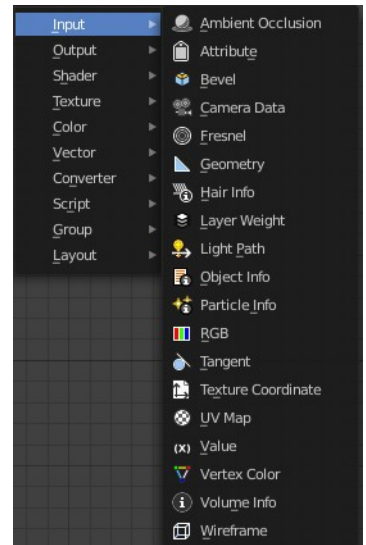
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## Add menu - Input

The Input menu contains Input node types.

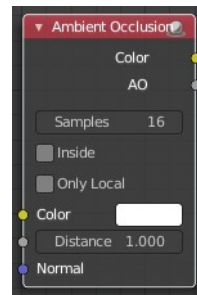
The content is the same for all three sub modes. Note that you need to tick Use Nodes to activate the menu items when you are in Line Style sub mode.



## Ambient Occlusion

Ambient Occlusion is a technique to self shadow the geometry of objects. Corners are usually darker than flat areas.

Hint, you should either use Ambient Occlusion or Global Illumination, since GI includes AO techniques.



### Inputs

#### **Color**

Tint for AO output color.

#### **Distance Cycles Only**

Distance up to which other objects are considered to occlude the shading point.

#### **Normal**

Normal used for ambient occlusion. If nothing is connected the default shading normal is used.

### Properties

#### **Samples Cycles Only**

Number of samples to use for ray traced ambient occlusion sampling. Keep as low as possible for an optimal performance.

#### **Inside Cycles Only**

Detect convex rather than concave shapes, by computing occlusion inside mesh.

#### **Only Local Cycles Only**

Only detect occlusion from the object itself, and not others.

### Outputs

#### **Color**

Ambient occlusion with color tint.

#### **AO**

Ambient occlusion factor without color tint.

---

## Attribute

The Attribute node allows you to retrieve attributes attached to an object or mesh.

This node has no inputs.

## Properties

### **Name**

Name of the attribute that you want to use.

Most attributes are easily available. Some not. Examples of not so obvious ones:

Vertex Color Layers can be retrieved this by their names.

Density gives a scalar defining the density of any smoke inside the Fluid Domain.

Color gives the color of the smoke inside the Fluid Domain. The color and vector outputs are the same. The Factor output is an average of the channels.

Temperature gives a scalar defining the temperature of the volume. Values in the range 0 - 1 map to 0 - 1000 kelvin. This may be used to render physically-based fire with the Blackbody or Principled Volume shaders. All three outputs are the same.

Flame gives a scalar defining the density of any fire inside the Fluid Domain. All three outputs are the same.

Ocean Foam gives a scalar defining where foam might appear when using an Ocean Modifier. This depends on the name you give this property.

## Outputs

### **Color**

RGB color interpolated from the attribute.

### **Vector**

XYZ vector interpolated from the attribute.

### **Factor**

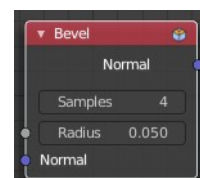
Scalar value interpolated from the attribute.

---

## Bevel

### **Cycles Only**

The Bevel shader node can be used for rendering rounded corners to capture specular highlights. The geometry is not modified. The modification happens at shader level.



## Inputs

### **Radius**

Width of the bevel effect on edges.

## ***Normal***

Normal to apply bevel on top of, to be combined with a Bump node for example.

## **Properties**

### ***Samples***

Number of samples to take for each shader evaluation. More samples give more accurate results, but are also slower to render. The default value of 4 works well for most cases, with any noise resolved by using more AA samples.

## **Outputs**

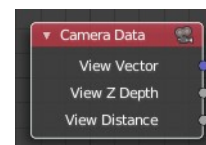
### ***Normal***

Standard normal output.

---

## **Camera Data**

With the Camera Data node you can get information about the position of the object relative to the camera. This could be used for example to change the shading of objects further away from the camera, or make custom fog effects.



## **Inputs**

This node has no inputs.

## **Properties**

This node has no properties.

## **Outputs**

### ***View Vector***

A camera space vector from the camera to the shading point.

### ***View Z Depth***

The distance each pixel is away from the camera.

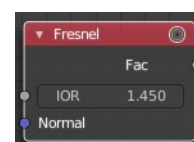
### ***View Distance***

Distance from the camera to the shading point.

---

## **Fresnel**

The Fresnel effect says that the more a face goes towards 180 degrees, the more it is reflecting. With 180 degrees every object in real life is 100% reflective, no matter how the



material is.

## Inputs

### ***IOR***

Index of refraction (IOR) of the material being entered.

### ***Normal***

Input meant for plugging in bump or normal maps which will affect the output.

## Outputs

### ***Factor***

Fresnel weight, indicating the probability with which light will reflect off the layer rather than passing through.

---

## Geometry

The Geometry node gives geometric information about the current shading point. All vector coordinates are in World Space. For volume shaders, only the position and incoming vector are available.

## Outputs

### ***Position***

Position of the shading point.

### ***Normal***

Shading normal at the surface (includes smooth normals and bump mapping).

### ***Tangent***

Tangent at the surface.

### ***True Normal***

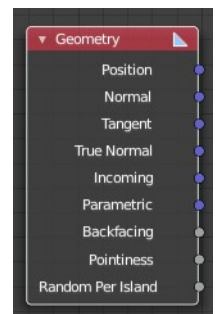
Geometry or flat normal of the surface.

### ***Incoming***

Vector pointing towards the point the shading point is being viewed from.

### ***Parametric***

Parametric coordinates of the shading point on the surface. To area lights it outputs its UV coordinates in planar mapping and in spherical coordinates to point lights.





## ***Backfacing***

1.0 if the face is being viewed from the back side, 0.0 for the front side.

## ***Pointiness Cycles Only***

An approximation of the curvature of the mesh per vertex. Lighter values indicate convex angles, darker values indicate concave angles. It allows you to do effects like dirt maps and wear-off effects.

## ***Random Per Island Cycles Only***

A random value for each connected component (island) of the mesh. It is useful to add variations to meshes composed of separated units like tree leaves, wood planks, or curves of multiple splines.

## **Hair Info**

The Hair Info node gives access to Hair information.



### **Outputs**

#### ***Is Strand***

Returns 1 when the shader is acting on a strand, otherwise 0.

#### ***Intercept***

The point along the strand where the ray hits the strand (1 at the tip and 0 at the root).

#### ***Thickness***

The thickness of the strand at the point where the ray hits the strand.

#### ***Tangent Normal***

Tangent normal of the strand.

#### ***Random***

A random per-hair value in the range from 0 to 1. It can for example be used in combination with a color ramp, to randomize the hair color.

## **Layer Weight**

The Layer Weight node outputs a weight typically used for layering shaders with the Mix Shader node.



### **Inputs**

#### ***Blend***

Bias the output towards all 0 or all 1. Useful for uneven mixing of shaders.

## **Normal**

Input meant for plugging in bump or normal maps which will affect the output.

## **Outputs**

### **Fresnel**

Dielectric Fresnel weight, useful for example for layering diffuse and glossy shaders to create a plastic material. This is like the Fresnel node, except that the input of this node is in the often more convenient 0.0 to 1.0 range.

### **Facing**

Weight that blends from the first to the second shader as the surface goes from facing the viewer to viewing it at a grazing angle.

---

## **Light Path**

The Light Path node is used to find out for which kind of incoming ray the shader is being executed. This is useful for non-physically-based tricks.

## **Outputs**

### **Is Camera Ray**

1.0 if shading is executed for a camera ray, 0.0 otherwise.

### **Is Shadow Ray**

1.0 if shading is executed for a shadow ray, 0.0 otherwise.

### **Is Diffuse Ray**

1.0 if shading is executed for a diffuse ray, 0.0 otherwise.

### **Is Glossy Ray**

1.0 if shading is executed for a glossy ray, 0.0 otherwise.

### **Is Singular Ray Cycles Only**

1.0 if shading is executed for a singular ray, 0.0 otherwise.

### **Is Reflection Ray Cycles Only**

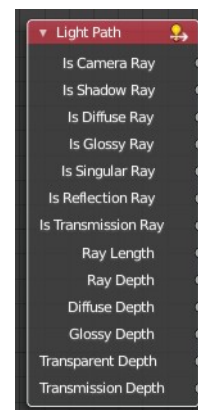
1.0 if shading is executed for a reflection ray, 0.0 otherwise.

### **Is Transmission Ray Cycles Only**

1.0 if shading is executed for a transmission ray, 0.0 otherwise.

### **Ray Length Cycles Only**

Distance traveled by the light ray from the last bounce or camera.



## **Ray Depth**

Number of times the ray been reflected or transmitted on interaction with a surface.

Note. Passing through a transparent shader does not count as a normal “bounce”.

## **Diffuse Depth Cycles Only**

Number of times the ray has gone through diffuse reflection or transmission.

## **Glossy Depth Cycles Only**

Number of times the ray has gone through glossy reflection or transmission.

## **Transparent Depth Cycles Only**

Returns the number of transparent surfaces passed through.

## **Transmission Depth Cycles Only**

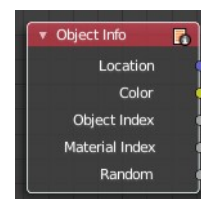
Replace a Transmission light path after X bounces with another shader, e.g. a Diffuse one. This can be used to avoid black surfaces, due to low amount of max bounces.

---

## **Object Info**

The Object Info node gives information about the object instance.

Note that this node only works for material shading nodes; it does nothing for light and world shading nodes.



## **Outputs**

### **Location**

Location of the object in world space.

### **Color**

Object color, same as Color in the Properties Editor > Object > Viewport Display.

### **Object Index**

Object pass index, same as Pass Index in the Properties Editor > Object > Relations.

### **Material Index**

Material pass index, same as Pass Index in the Properties Editor > Material > Settings.

### **Random**

Random number unique to a single object instance.

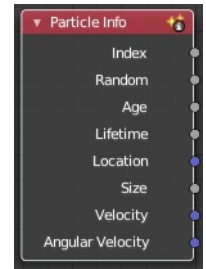
---

## Particle Info

### Cycles Only

This node gives access to the data of the particle that spawned the object instance.

Note that this node currently only supports parent particles. Info from child particles is not available.



### Outputs

#### ***Index***

Index number of the particle (from 0 to number of particles).

#### ***Random***

A random per-particle value in the range from 0 to 1. It can for example be used in combination with a color ramp, to randomize the particle color.

#### ***Age***

Age of the particle in frames.

#### ***Lifetime***

Total lifespan of the particle in frames.

#### ***Location***

Location of the particle.

#### ***Size***

Size of the particle.

#### ***Velocity***

Velocity of the particle.

#### ***Angular Velocity***

Angular velocity of the particle.

---

## RGB

Set a color.

### Properties

The RGB node uses the color picker widget.



## Outputs

### **Color / RGBA**

A single RGBA color value.

---

## Tangent

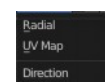
The Tangent node generates a tangent direction for the Anisotropic BSDF.



## Properties

### **Direction Type**

The tangent direction can be derived from a cylindrical projection around the X, Y, or Z axis (radial), or from a manually created UV Map for full control.



## Outputs

### **Tangent**

The tangent direction vector.

---

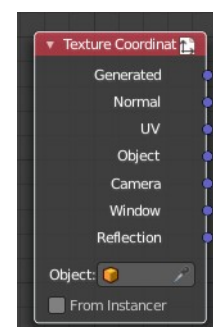
## Texture Coordinate

Define some texture coordinate types. The types are pretty self explaining.

## Properties

### **Object**

Specific object to use for object space coordinates. This only affects the Object output.



### **From Instancer**

#### **Cycles Only!**

If the object is generated by instancing from vertices or faces, use texture coordinates from instancer. This only affects the Generated and UV outputs.

## Output

### **Generated**

Uses automatically generated texture coordinates, calculated from the bounding box.

### **Normal**

Uses the normals for the texture coordinates.

## UV

Uses the UV mapping for the texture coordinates.

## Object

Uses the Object for the texture coordinates.

## Camera

Uses the position coordinate in camera space for texture coordinates.

## Window

Uses the location of shading point on the screen.

## Reflection

Uses the direction of the reflection vector as texture coordinates.

## UV Along Stroke

### Line Style Mode Only

The UV Along Stroke input node maps textures along the stroke length, making it possible to mimic pencil, paintbrush, and other art medium marks.

The pattern type can be set up in the properties editor in the Freestlye Line Style panel in the View Layer Properties tab. Don't forget to turn on Line Style in the Render Properties first. Or the Freestlye panels will not show.

Note! These UV maps become available only during the Freestyle rendering process. This means that the UV Along Stroke node cannot be replaced by the conventional UV Map input node. Since it takes an existing UV map already defined as part of mesh data.

## Properties

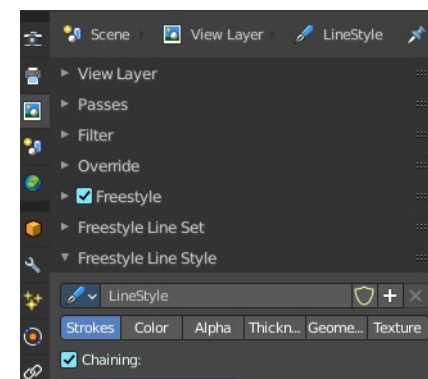
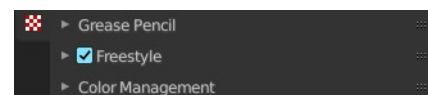
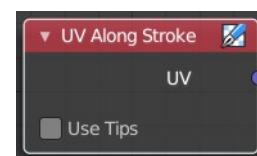
### Use Tips

Allows to use lower quarters of a texture image for the head and tail tips of a stroke, while the upper half for the stroke body.

## Outputs

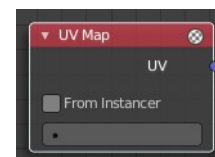
### UV

UV maps defined along strokes.



## UV Map

The UV Map node is used to retrieve specific UV maps. This node can retrieve any UV map that belongs to the object with this material.



## Properties

### *From Instancer Cycles Only*

See the From Instancer option of the Texture Coordinate Node.

### *UV Map edit box*

UV map to use.

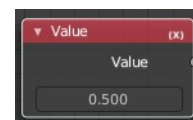
## Outputs

### *UV*

UV mapping coordinates from the specified UV map.

## Value

The Value Node is a simple node to input numerical values to other nodes in the tree.



## Properties

### *Default Value*

Type in a single numerical value (floating point).

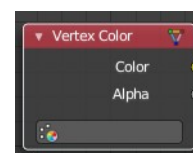
## Outputs

### *Value*

The value set in the options.

## Vertex Color

The Vertex Color node provides vertex colors as well as their alpha value.



## Properties

### *Vertex Color*

The target vertex color. The listed vertex colors are those of the mesh of the active object.

If the active object has no mesh, a warning will be displayed. If the property is marked in red, it means the vertex color is not available in the mesh of the active object, but it may be available in other meshes of objects

that share this material.

## Outputs

### **Color**

The vertex color.

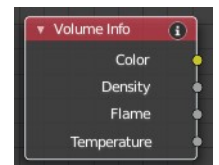
### **Alpha**

The alpha value.

---

## Volume Info

The Volume Info node provides information about Smoke Domains.



## Outputs

### **Color**

Smoke color.

### **Density**

Smoke density.

### **Flame**

Fire density.

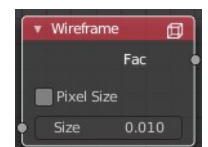
### **Temperature**

Temperature of the fire. Values in the range [0, 1] linearly maps to temperatures in the range [0, 1000] in Kelvin.

---

## Wireframe

The Wireframe node is used to retrieve and render the wireframe of the object. This happens as the edges of the object appears to Cycles.



Meshes are triangulated before being processed by Cycles. So the topology will always appear triangulated when viewed with the Wire frame node.

## Inputs

### **Size**

The input value used for unconnected socket.



## **Properties**

### ***Pixel Size***

When enabled, the size of edge lines is set in screen space.

## **Outputs**

### ***Factor***

Black-and-white mask showing white lines representing edges according to the object's topology.