

# KeyShot Material Graph

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# Before we Begin...

- This will be recorded
- Slideshow will be available
- KSP will be available
- Computer: 3 GHz 8 Core (16-thread)  
2013 Mac Pro, 16 Gb RAM
- If you have questions...



# Material Graph Topics

- General Overview
- Anatomy of a Node
- Node Types
- Hands On:
  - Adjusting Logo Colors
  - Combining Bump Textures
  - Fading Roughness Textures
  - Layered Materials
  - Gradient between Materials
- Q & A





# What is KeyShot's Material Graph?



- **KeyShot Pro feature**
- **A node-based visual editor**
- **Allows advanced material creation**
- **Opens in a separate window**

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# Examples of Advanced Materials







Rendering: Esben Oxholm



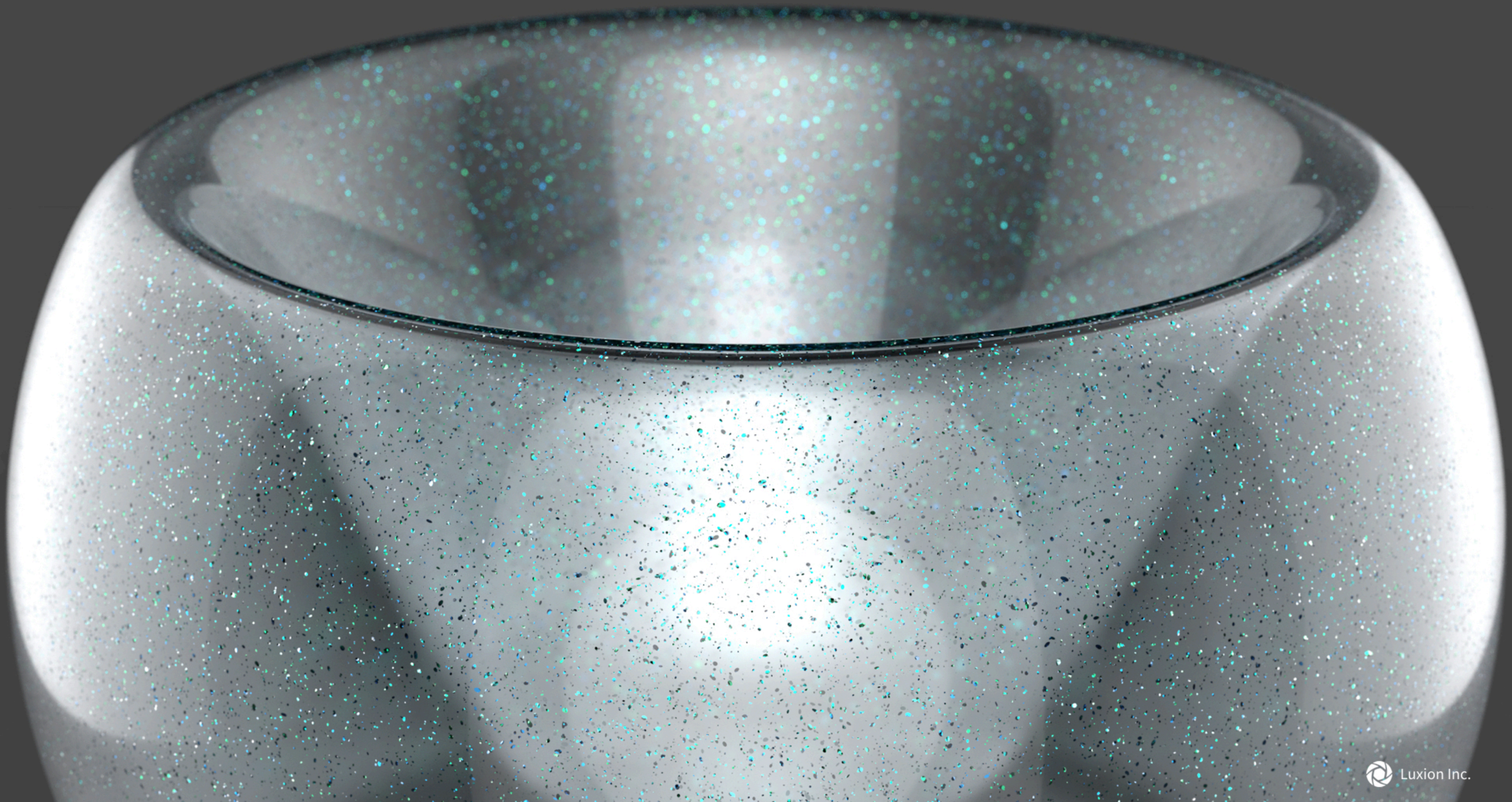
Rendering: John Seymour







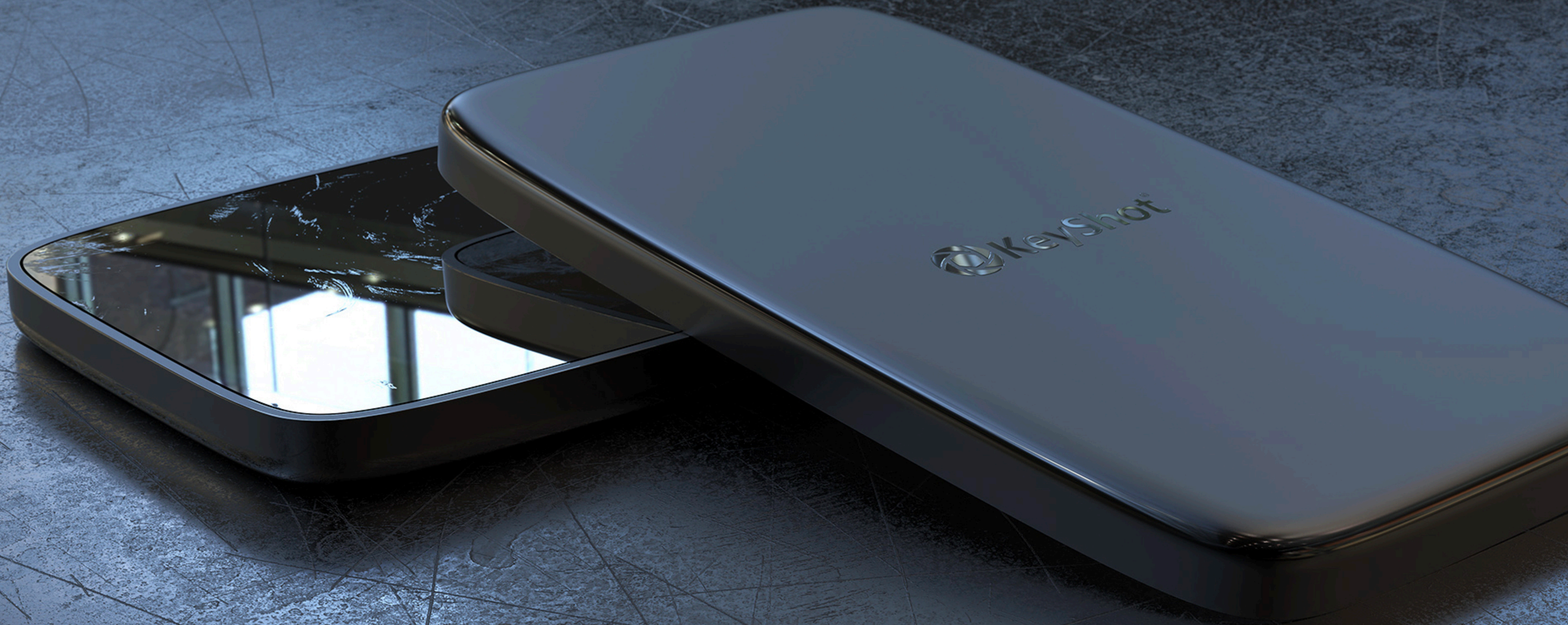










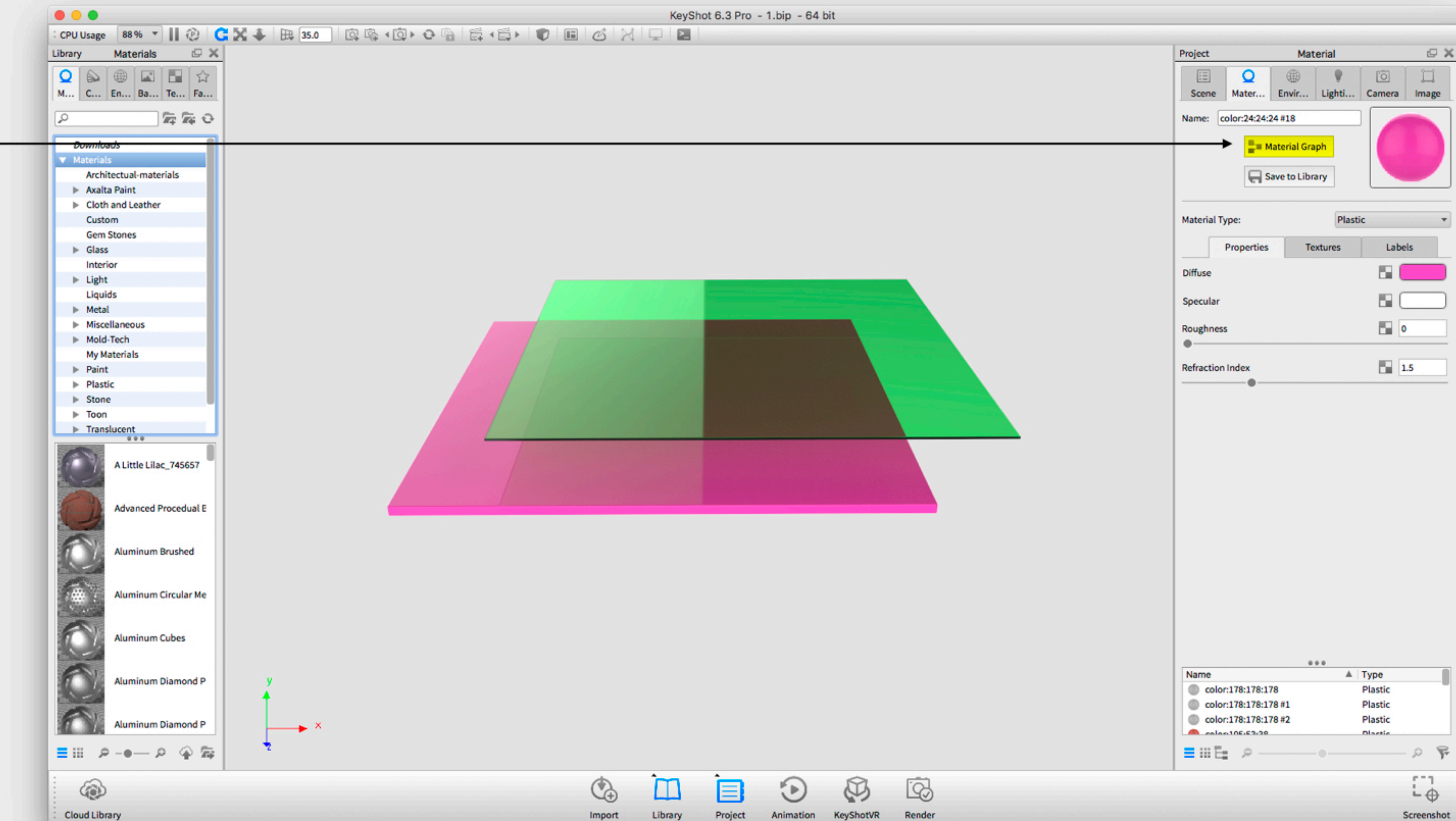




# Access the Material Graph

## To Open:

Click the Material Graph button, located in the Material Properties tab of the Project Panel





# Material Graph Workspace

## Ribbon

A tool bar for Material Graph Items

## Material Properties

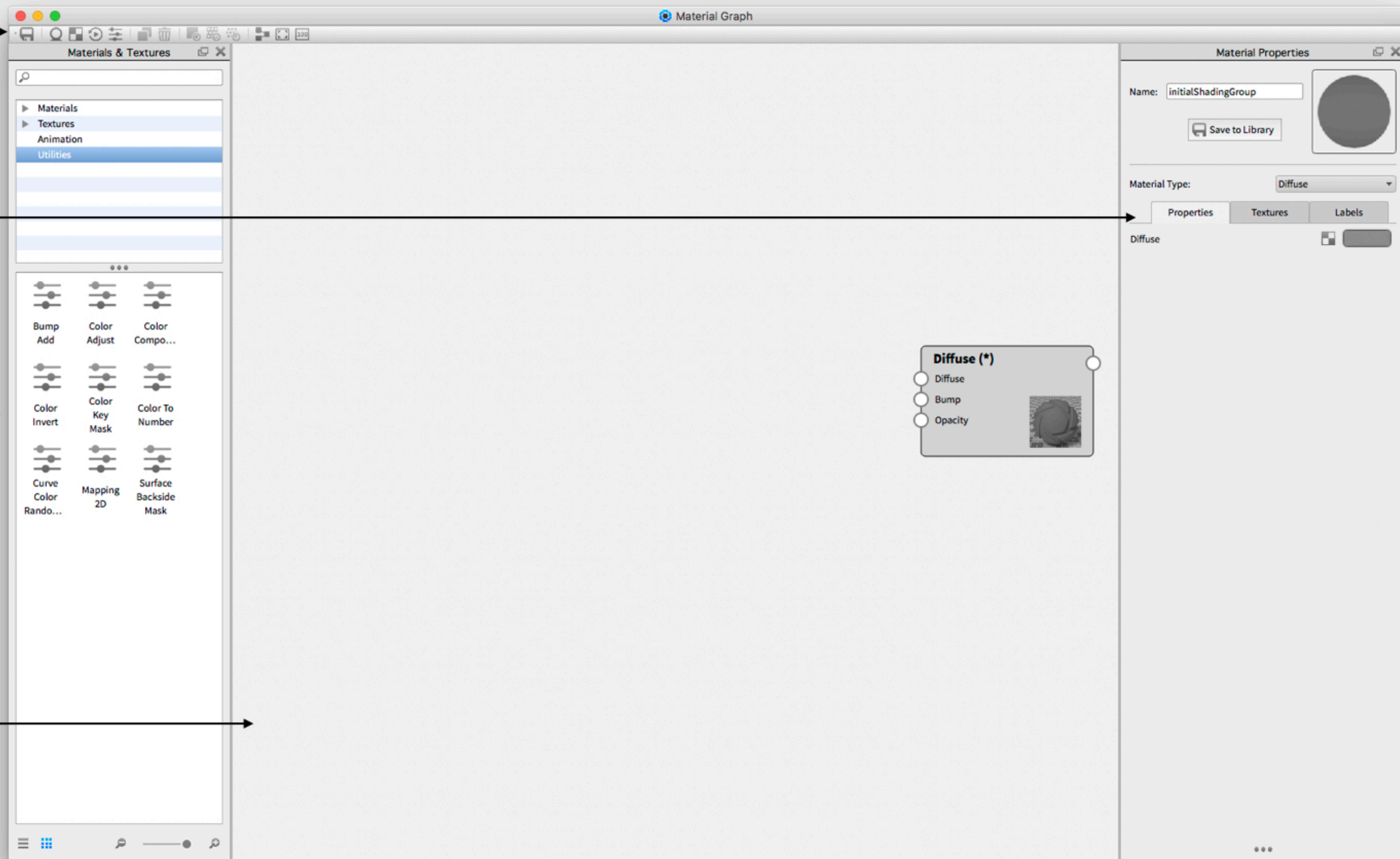
Area to adjust node parameters

## Node Library

A library of materials, procedural textures, utilities and animations that can be accessed from the work area

## Work Area

The open gray area where materials are built





# Anatomy of a Node



# Anatomy of a Node

## Nodes:

- Are building-blocks of materials
- Can be a material, texture, utility or animation
- Have input and output channels
- Output gets connected to another node's input to combine them
- Input channels vary by node type

### Node Name

Describes the node's function

### Output Channel

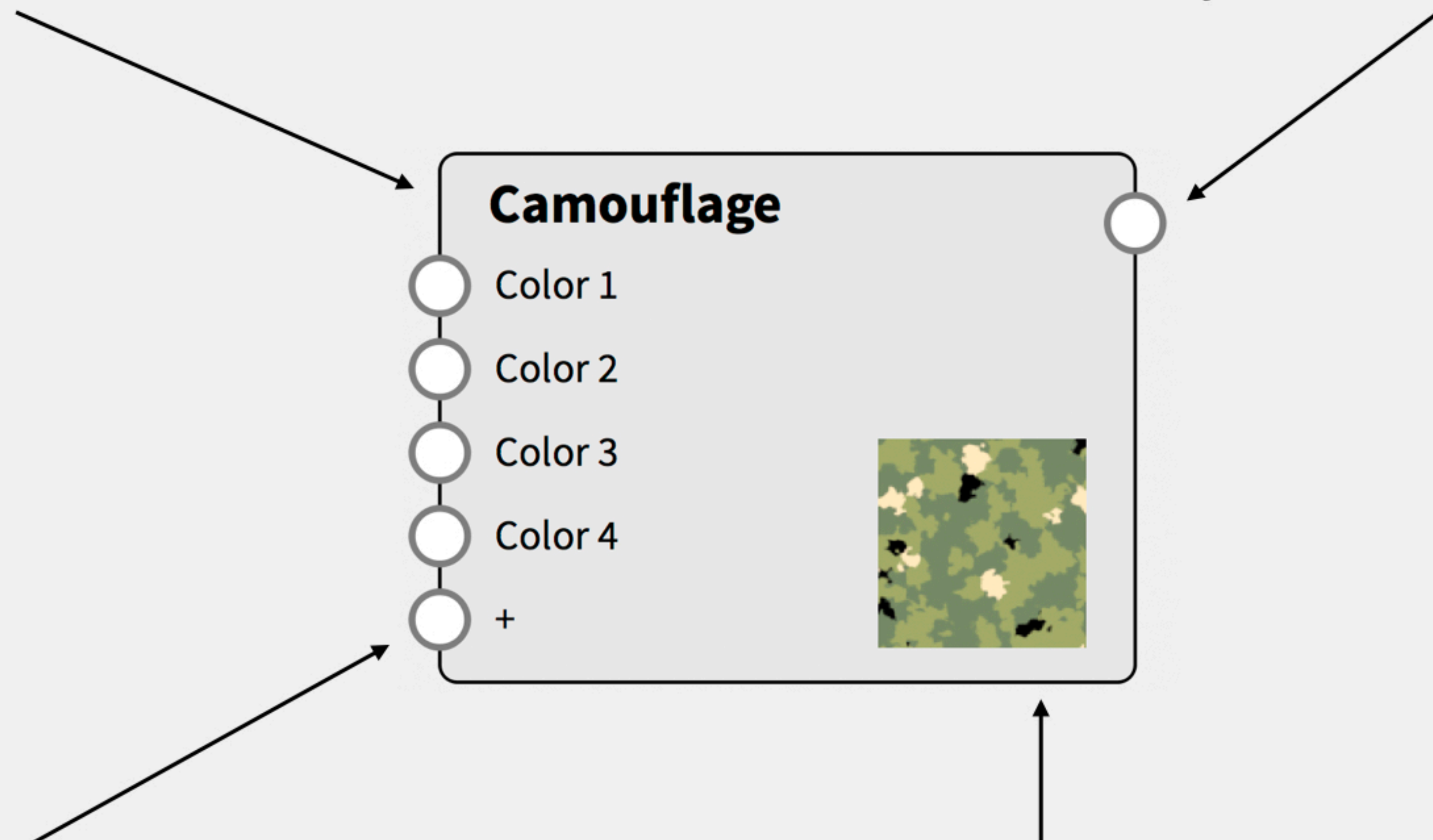
Nodes only have one output

### Input Channel(s)

Display of node's possible inputs

### Thumbnail Preview

Approximation of node's attributes





# Node Types



# KeyShot's Node Library

## Material Nodes

Materials ▶

Textures ▶

Animation ▶

Utilities ▶

Diffuse

Flat

Glass

Glass (Solid)

Liquid

Metal

Paint

Plastic

Thin Film

Translucent

Advanced

Anisotropic

Dielectric

Gem

Measured

Metallic Paint

Plastic (Transparent)

Translucent (Advanced)

Velvet

Area Light Diffuse

Point Light Diffuse

Point Light IES Profile

Emissive

Ground

Toon

Wireframe

Xray

## Texture Nodes

Materials ▶

Textures ▶

Animation ▶

Utilities ▶

Brushed

Cloth Weave

Fiber Weave

Mesh (Circular)

Mesh (Polygon)

Texture Map

Texture Map (Tiled)

Brushed (Radial)

Camouflage

Cellular

Color Gradient

Curvature

Granite

Leather

Marble

Noise (Fractal)

Noise (Texture)

Occlusion

Scratches

Spots

Vertex Color

Wood

Wood (Advanced)

## Animation Nodes

Materials ▶

Textures ▶

Animation ▶

Utilities ▶

Color Fade

Number Fade

## Utility Nodes

Materials ▶

Textures ▶

Animation ▶

Utilities ▶

Bump Add

Color Adjust

Color Composite

Color Invert

Color Key Mask

Color To Number

Curve Color Randomize

Mapping 2D

Surface Backside Mask



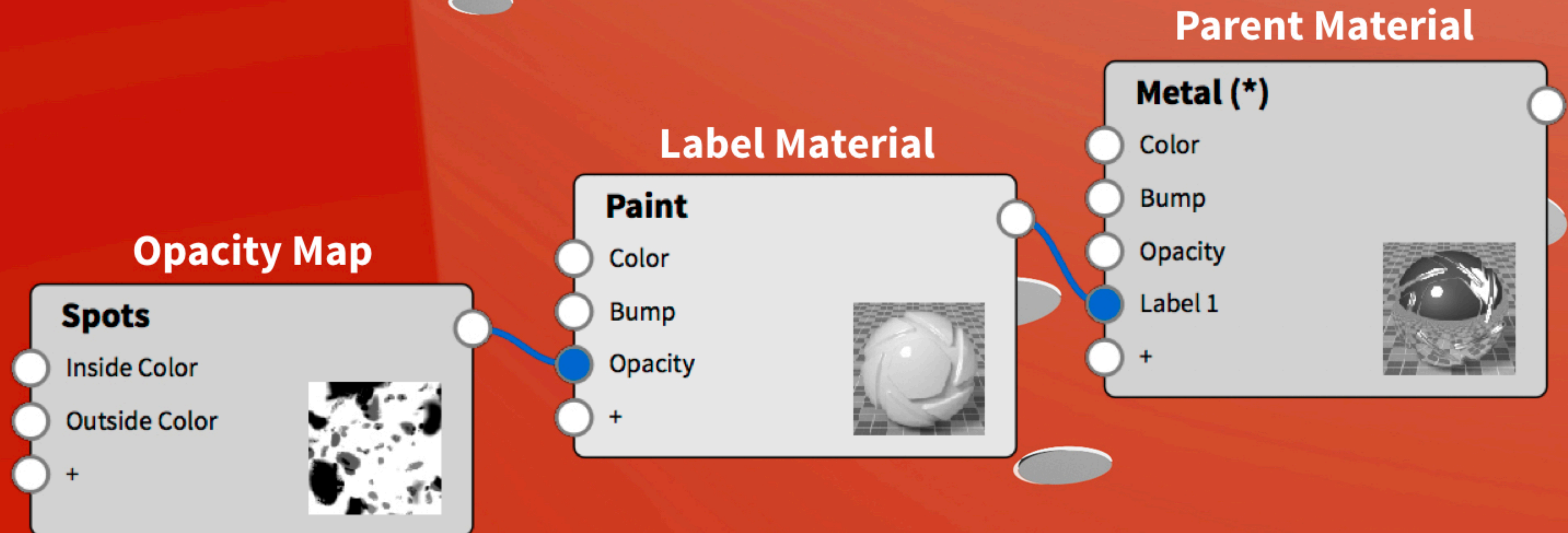
# Material Nodes



# Layered Materials

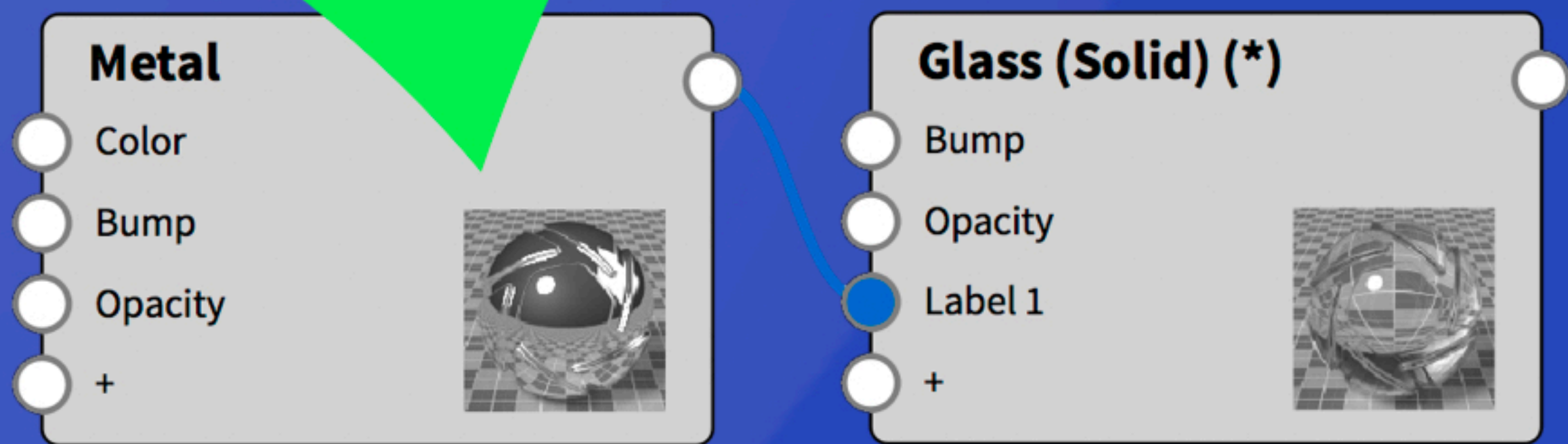
To layer, add material nodes as labels to parent material

Apply textures to a material's opacity channel to control its visibility

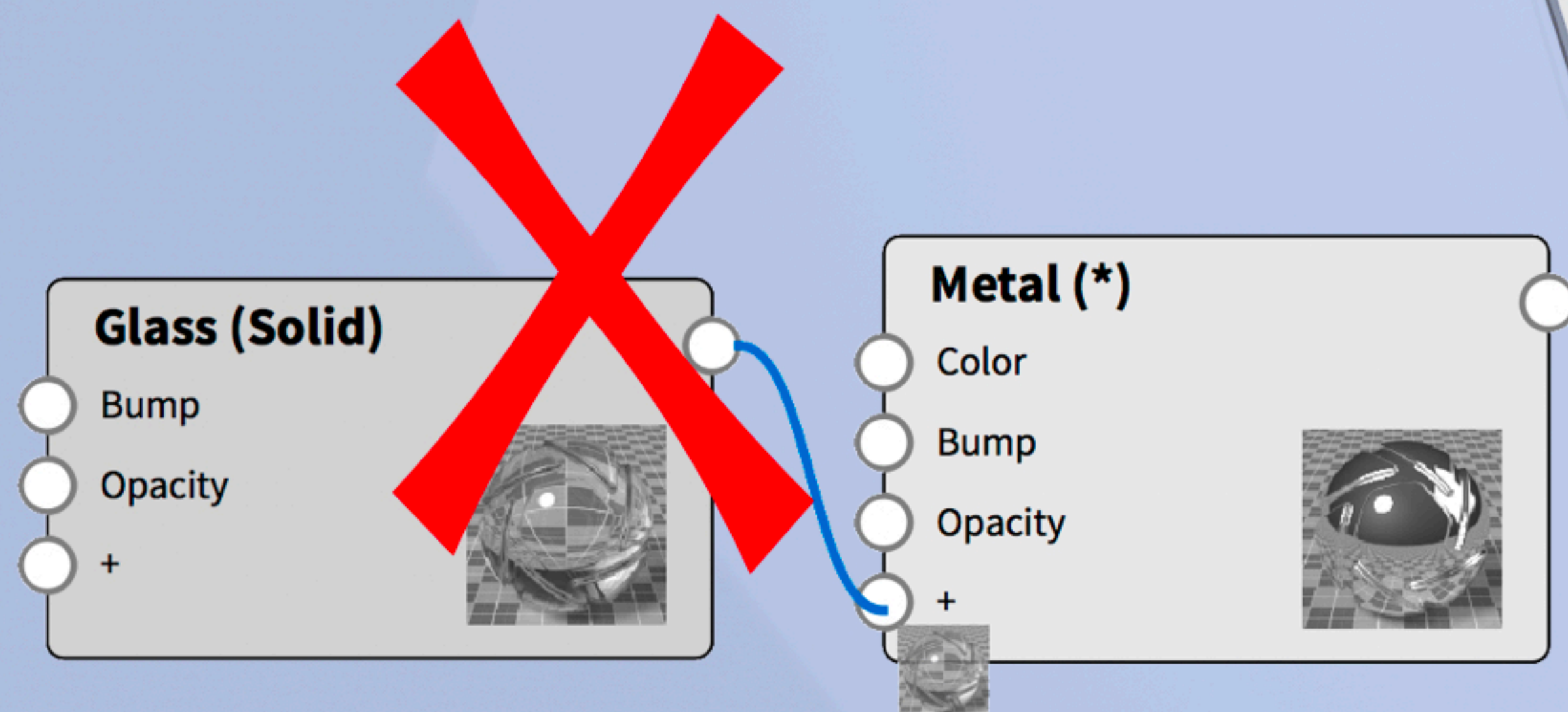




# Opaque materials on Transparent materials

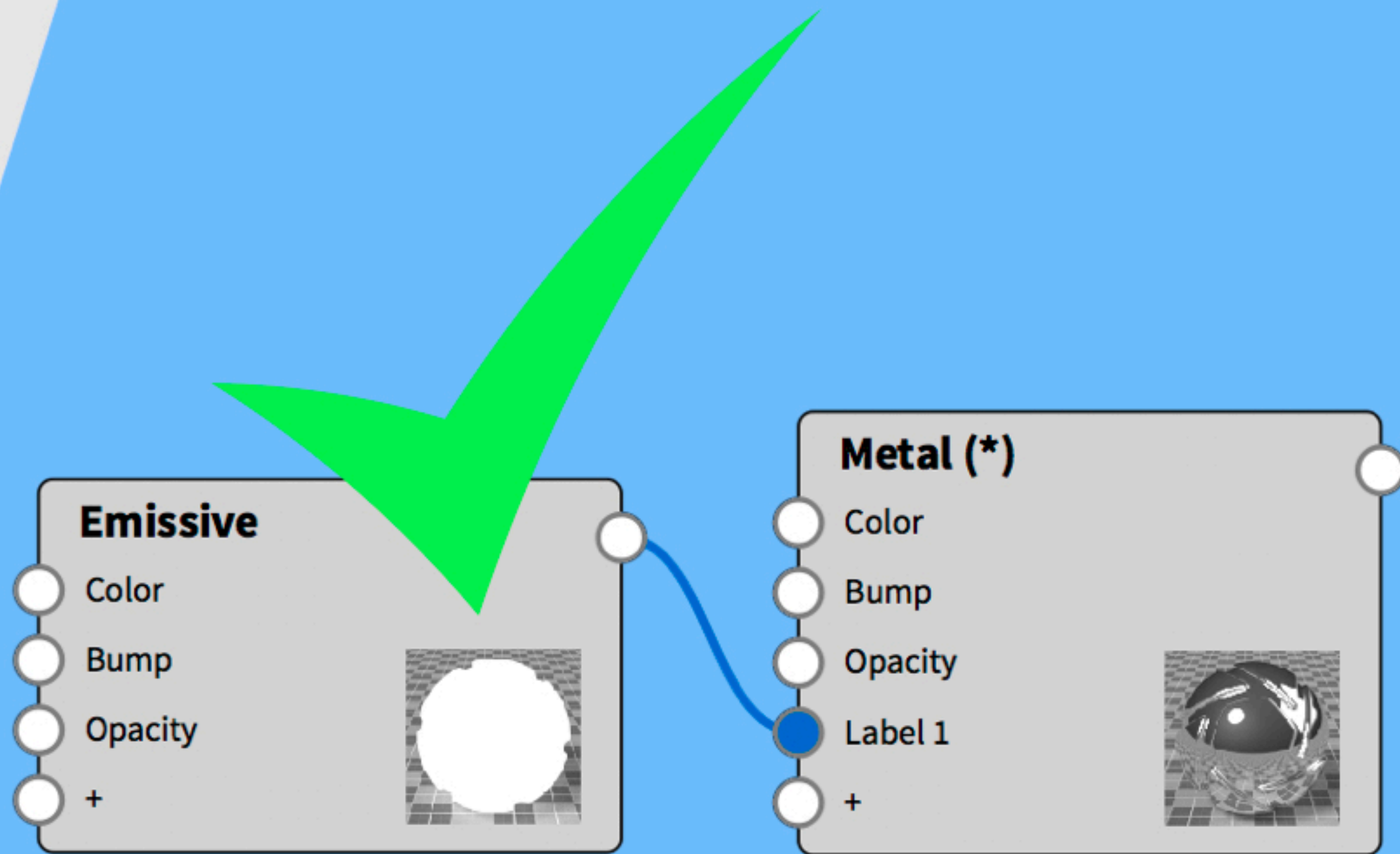


# Transparent materials on opaque materials

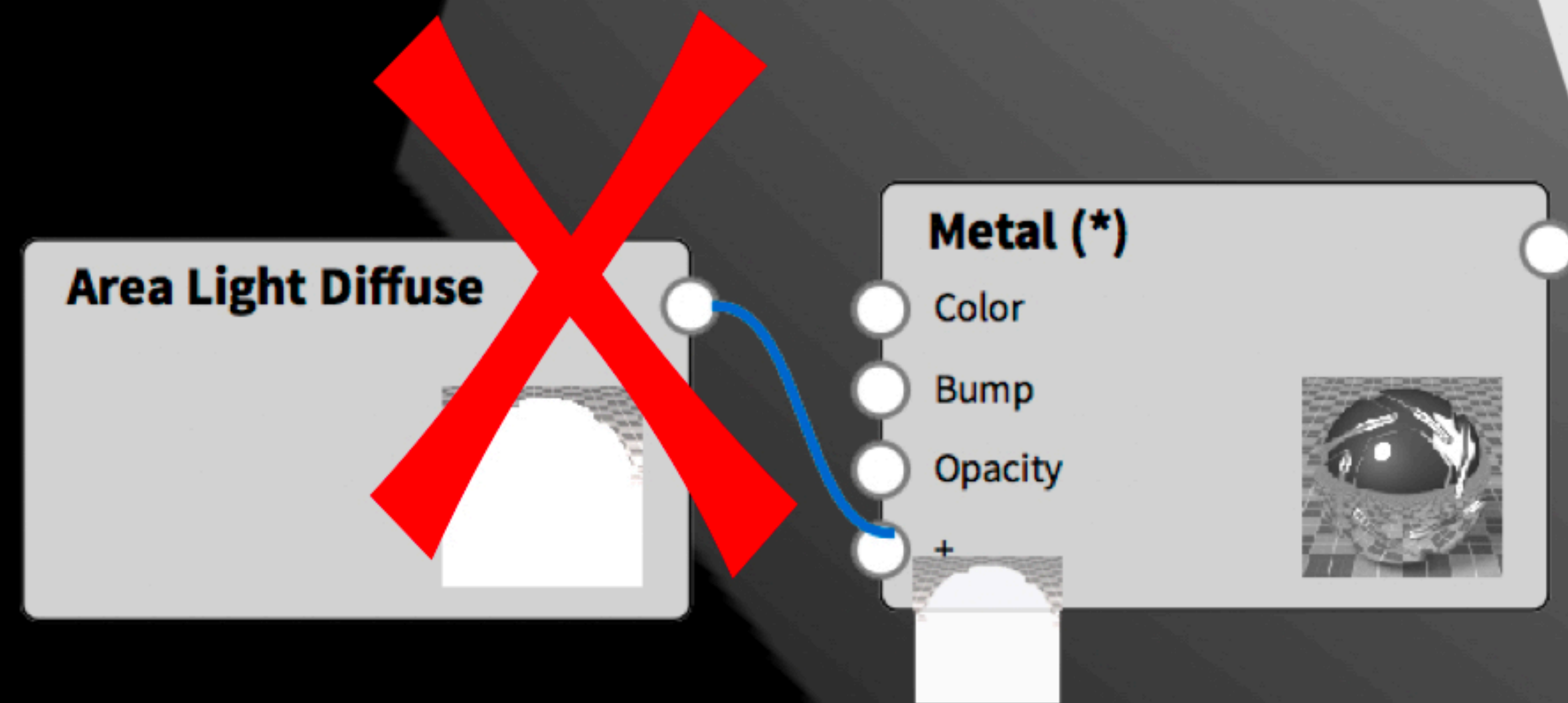




# Emissive materials Can be layered



# Light materials can NOT be layered





# Texture Nodes

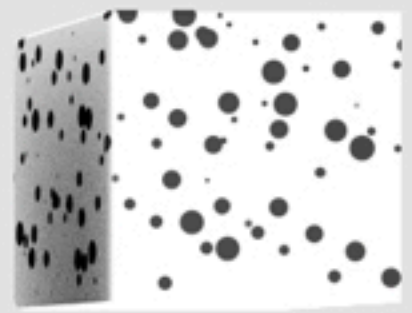
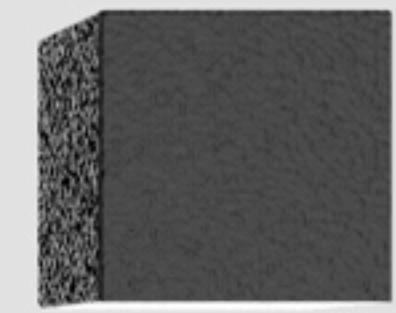
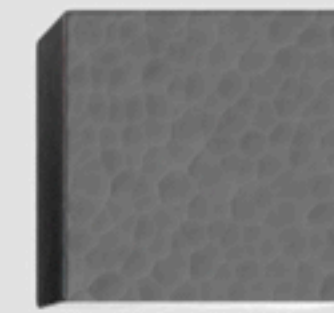
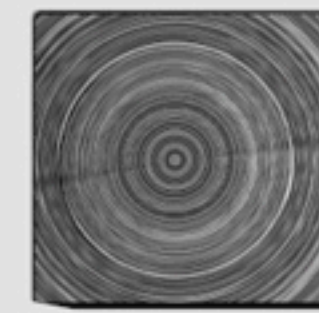
## Image-based textures

- To add: Drag into Material Graph Work area from Texture Library

**2D**

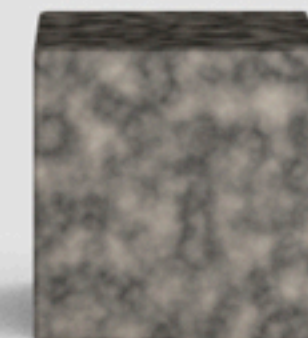
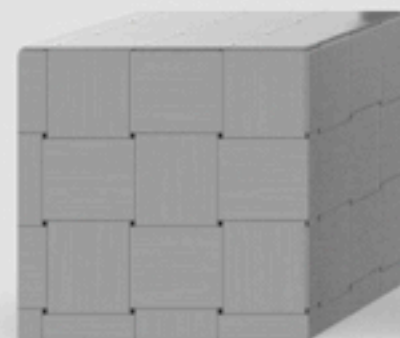
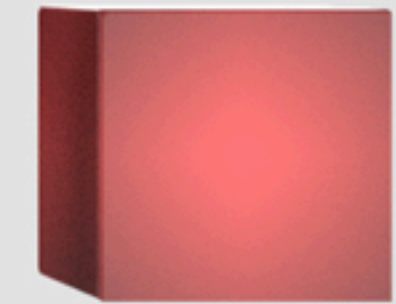
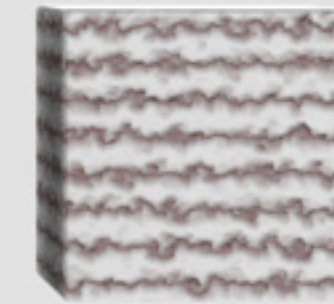
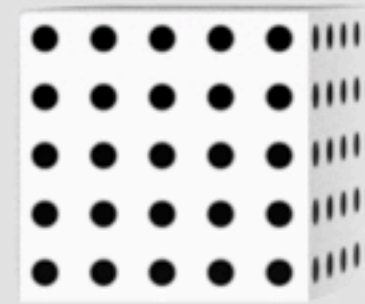
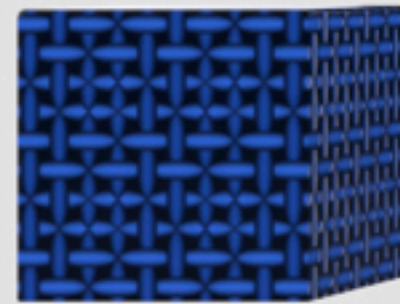


**3D**



## Procedural textures

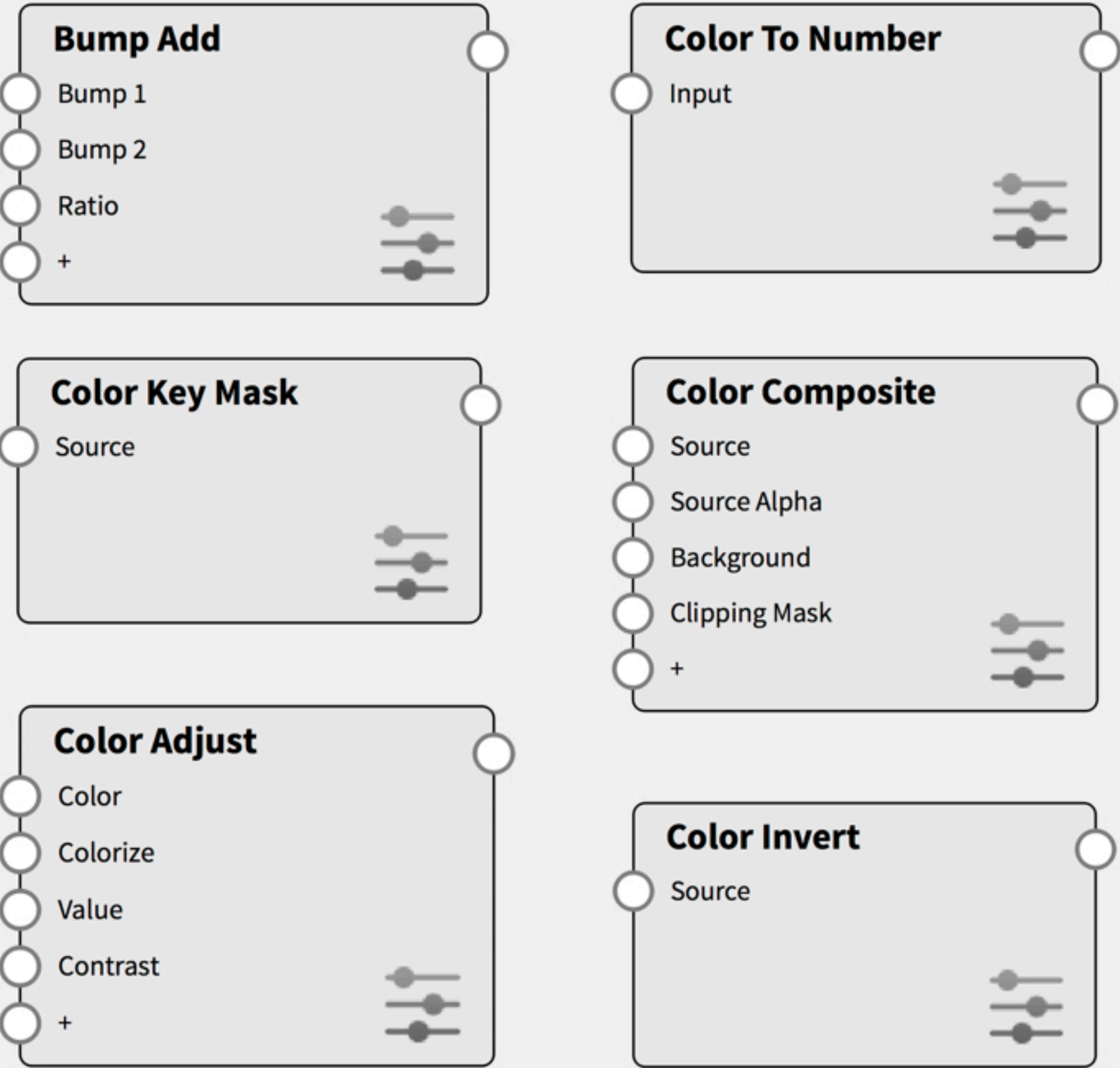
- 2D Procedurals
- 3D Procedurals
- Add from Node Library or right-click in Material Graph Work Area



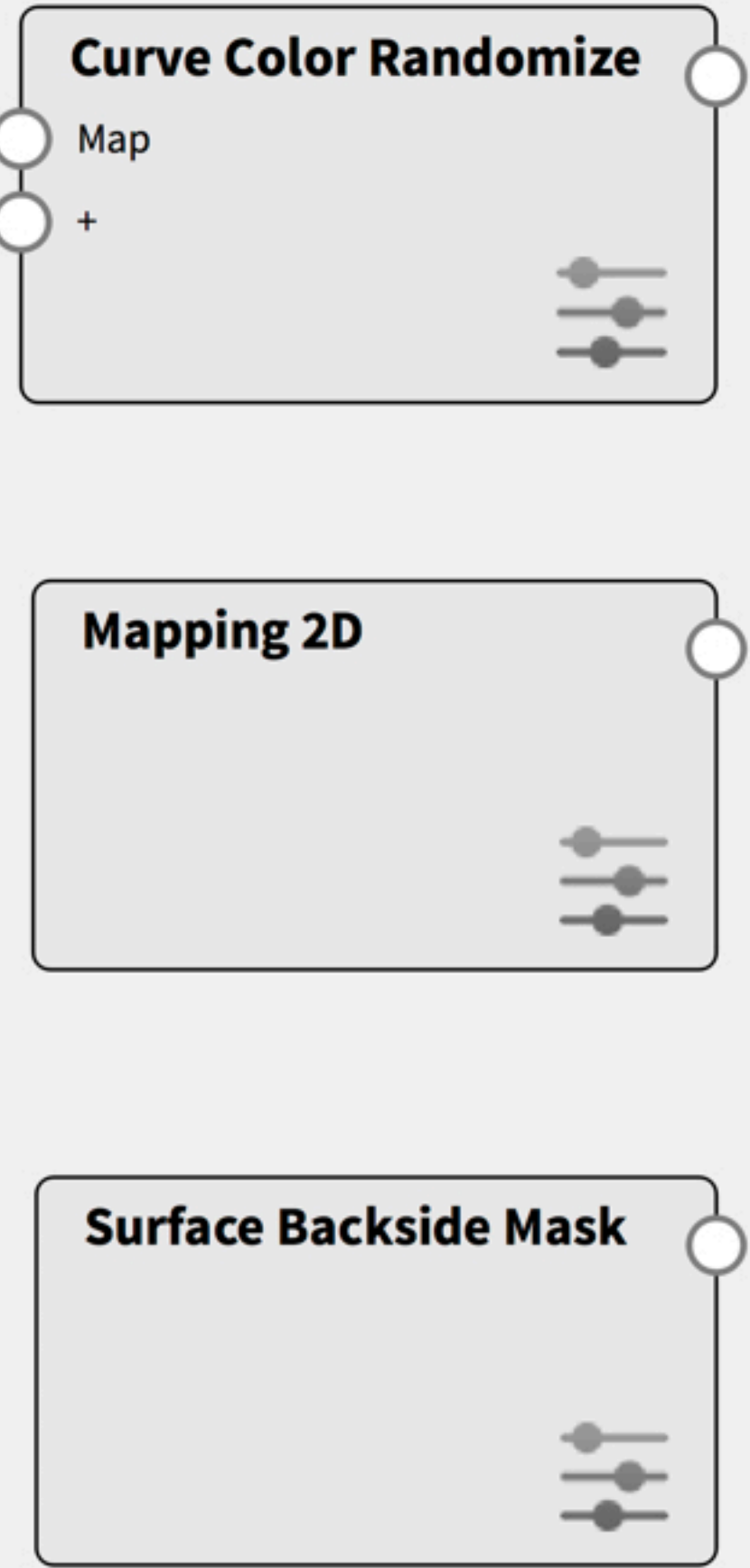


# Utility Nodes

## Standard Utility Nodes



## Experimental Utility Nodes





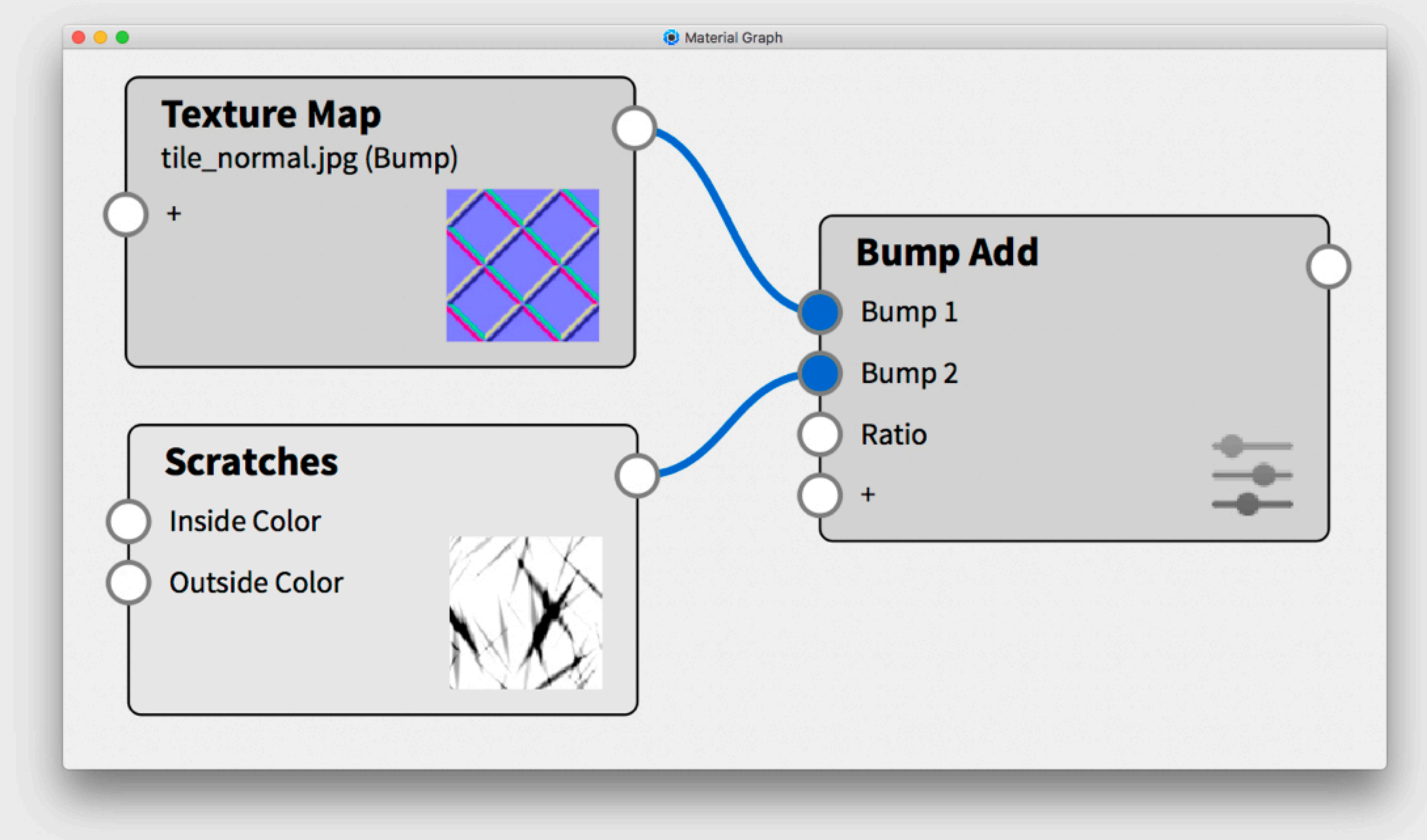
# Bump Add

- Combine two image-based textures or procedural textures
- Ex. Tile Normal + Scratches procedural

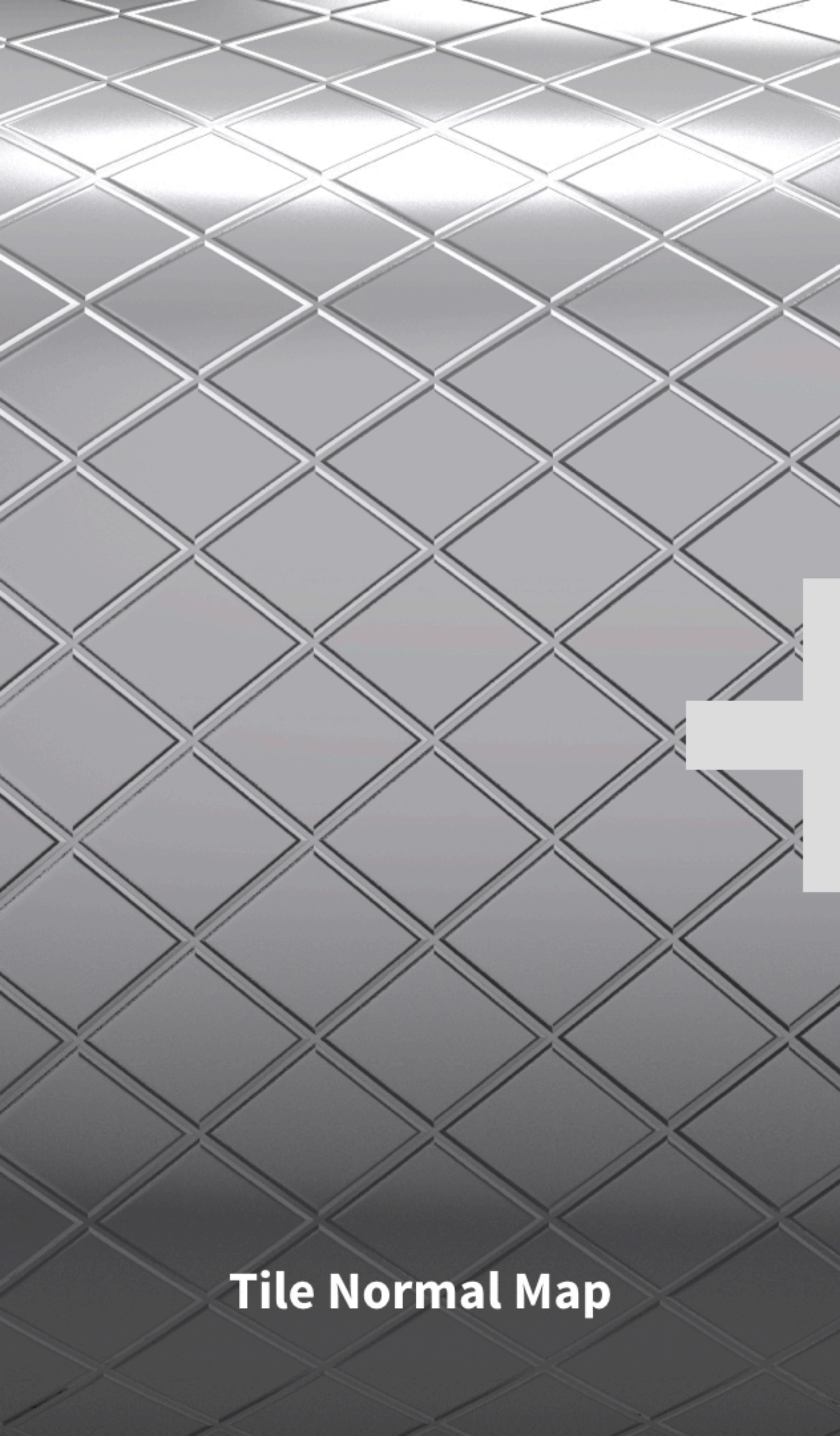
## Properties

Ratio Slider: Controls how much each bump texture is represented

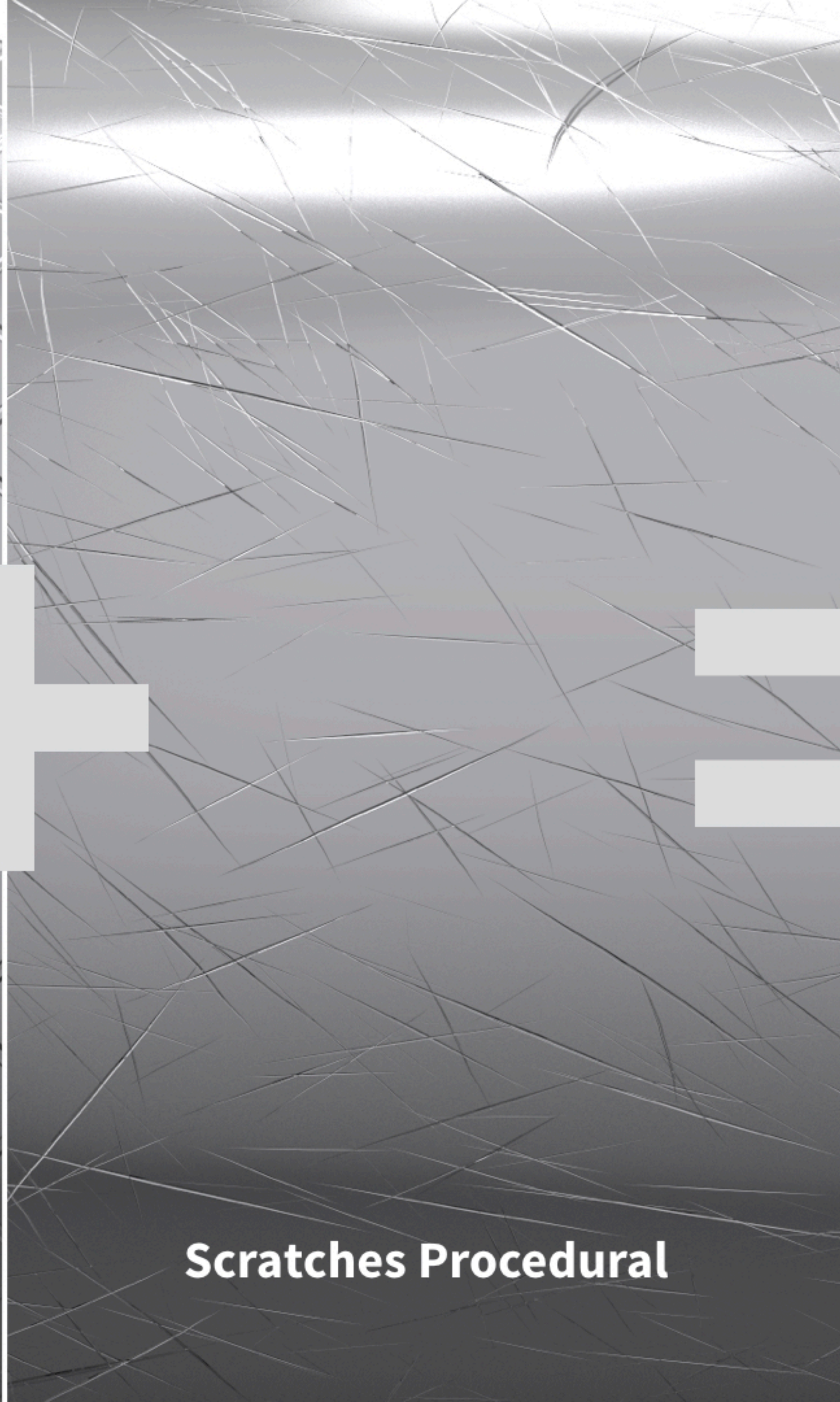
Weight 1 & 2: Strength of each individual texture



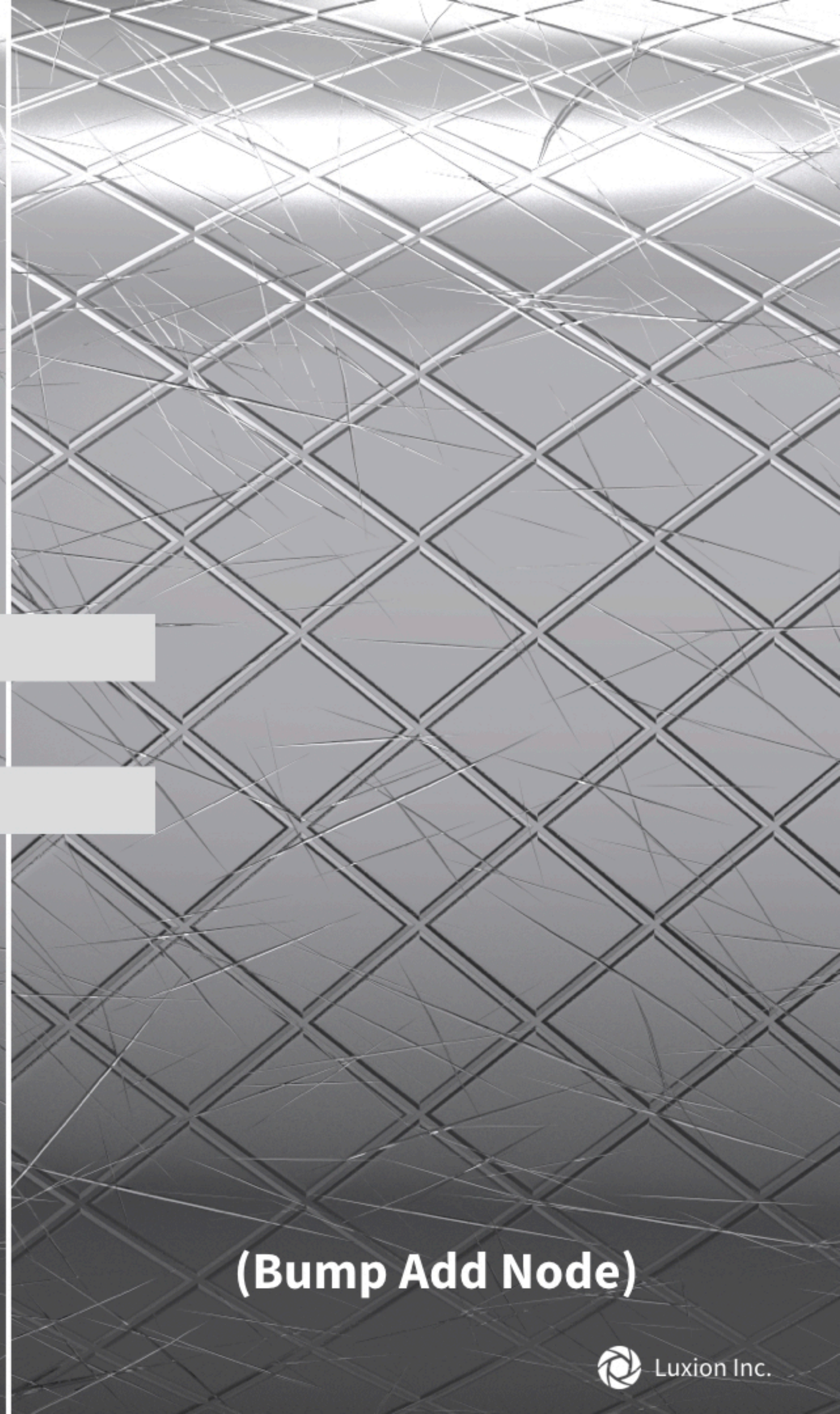




**Tile Normal Map**



**Scratches Procedural**



**(Bump Add Node)**







# Color Adjust

- *Modify existing color of a texture map or procedural texture*
- *Ex. Change color of a logo or graphic*

## Properties

**Color:** Change overall color of node's output  
(could be a texture)

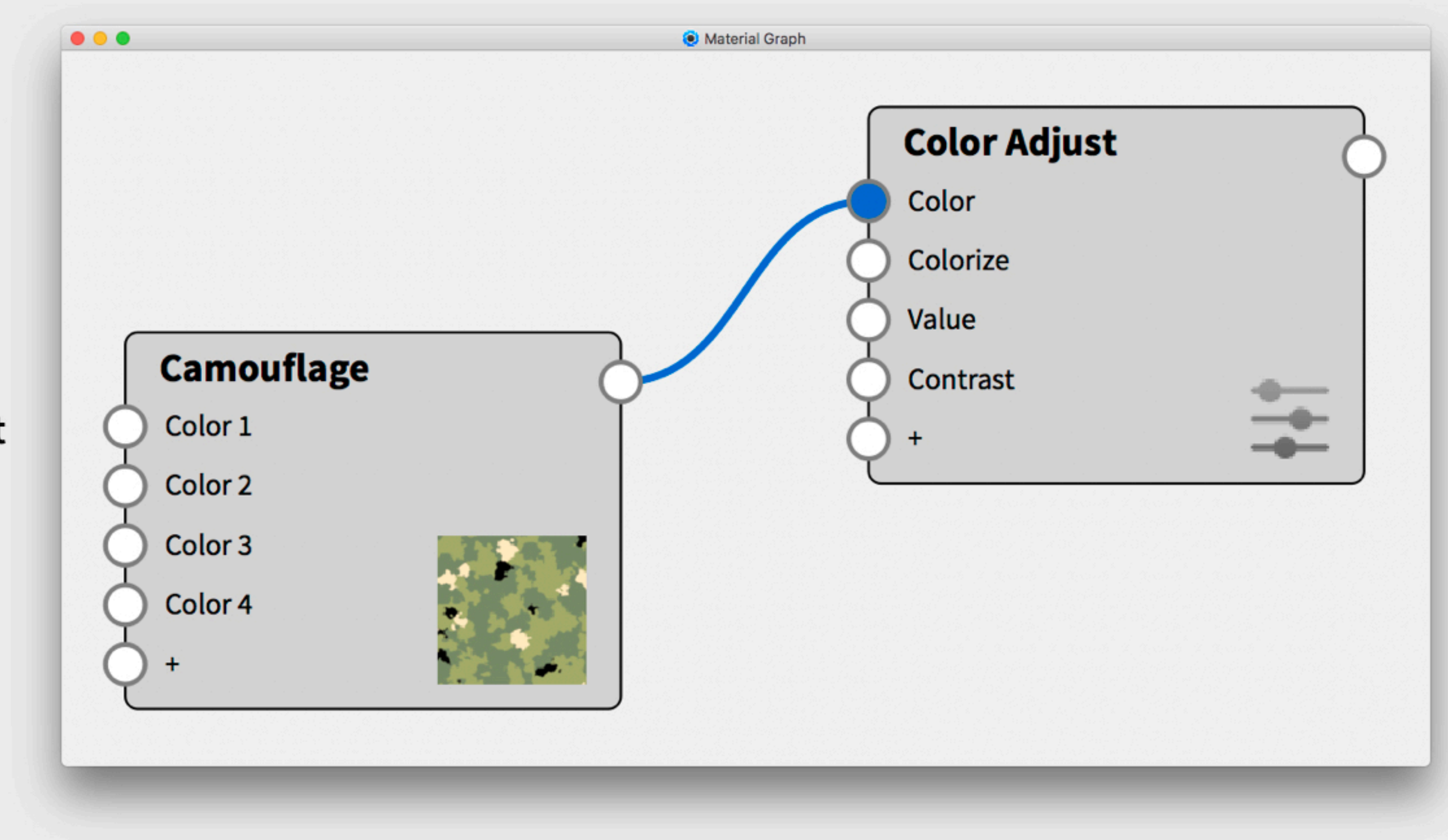
**Colorize:** Blends a secondary color to the overall color

**Hue Slider:** Controls 'pure color' of node's output

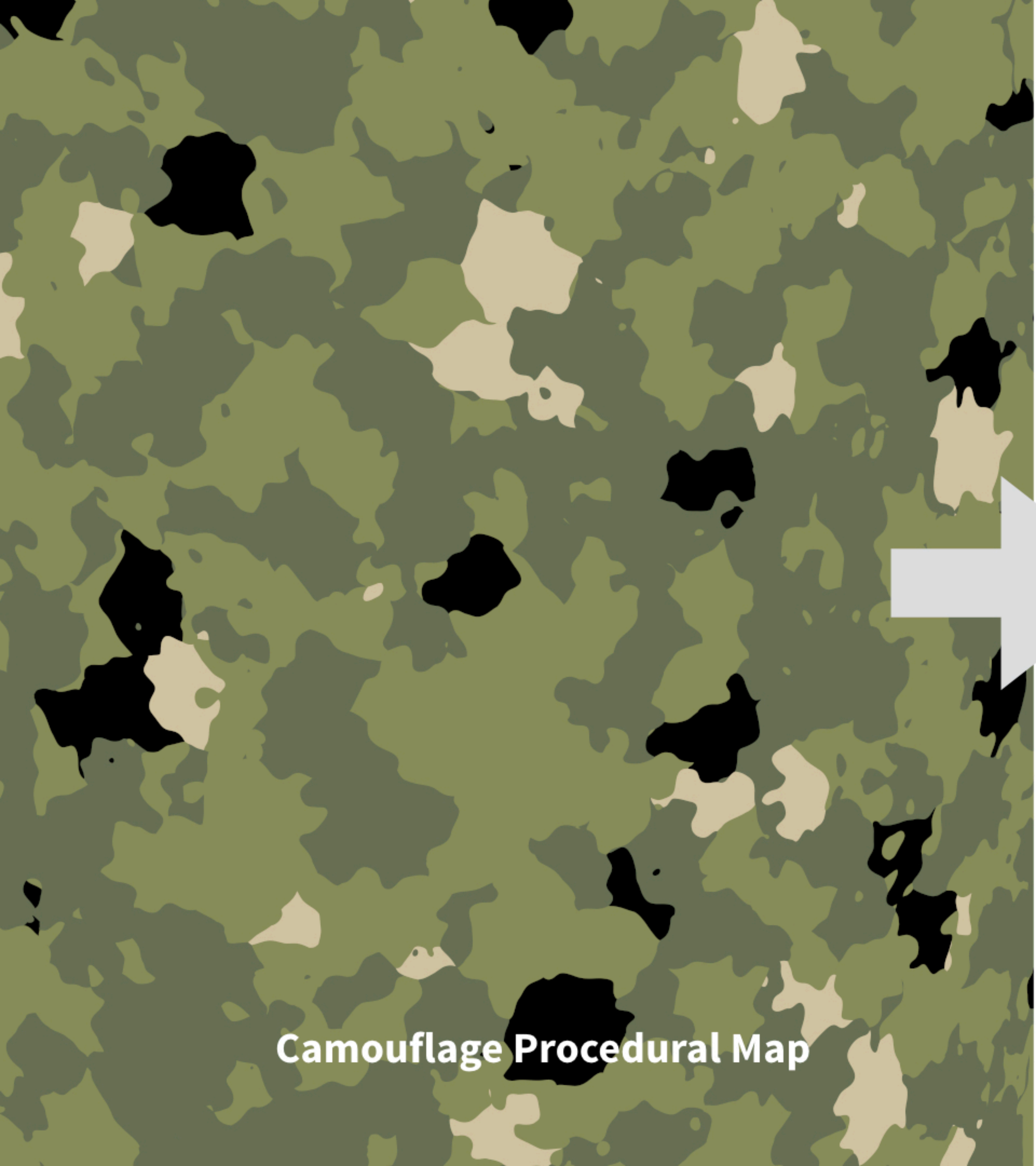
**Saturation Slider:** Controls amount of pure color (vibrancy) in node's output

**Value Slider:** Controls amount of white or black (brightness) is added to node output

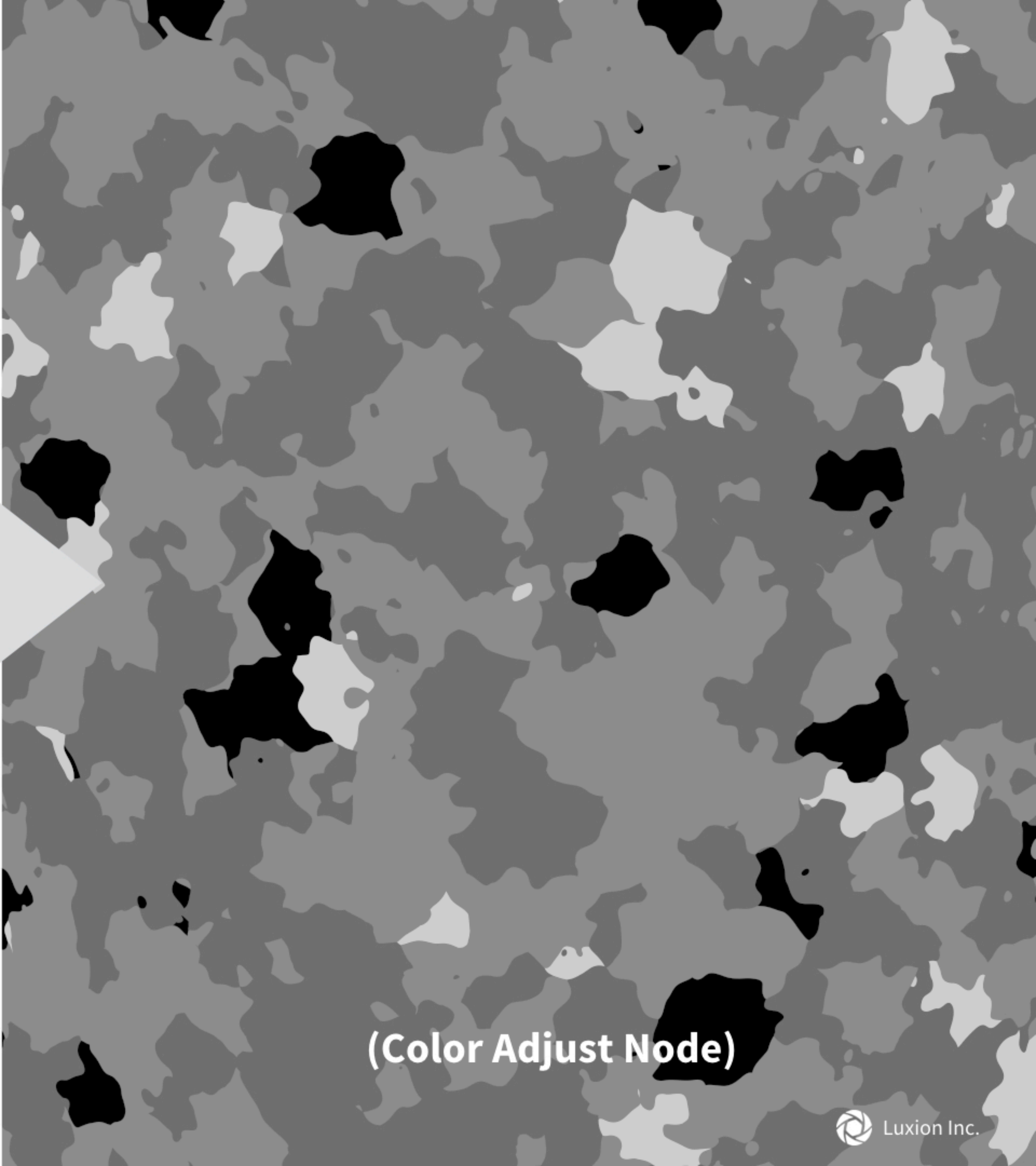
**Contrast Slider:** Increase or decrease range of value, hue and saturation of node's output







**Camouflage Procedural Map**



**(Color Adjust Node)**







# Color Composite

- *Combine multiple textures with blend modes and Alpha*
- *Similar to Photoshop layers' blending modes*
- *Ex. Combining and blending textures*

## Properties

Source: Think of as layer 1

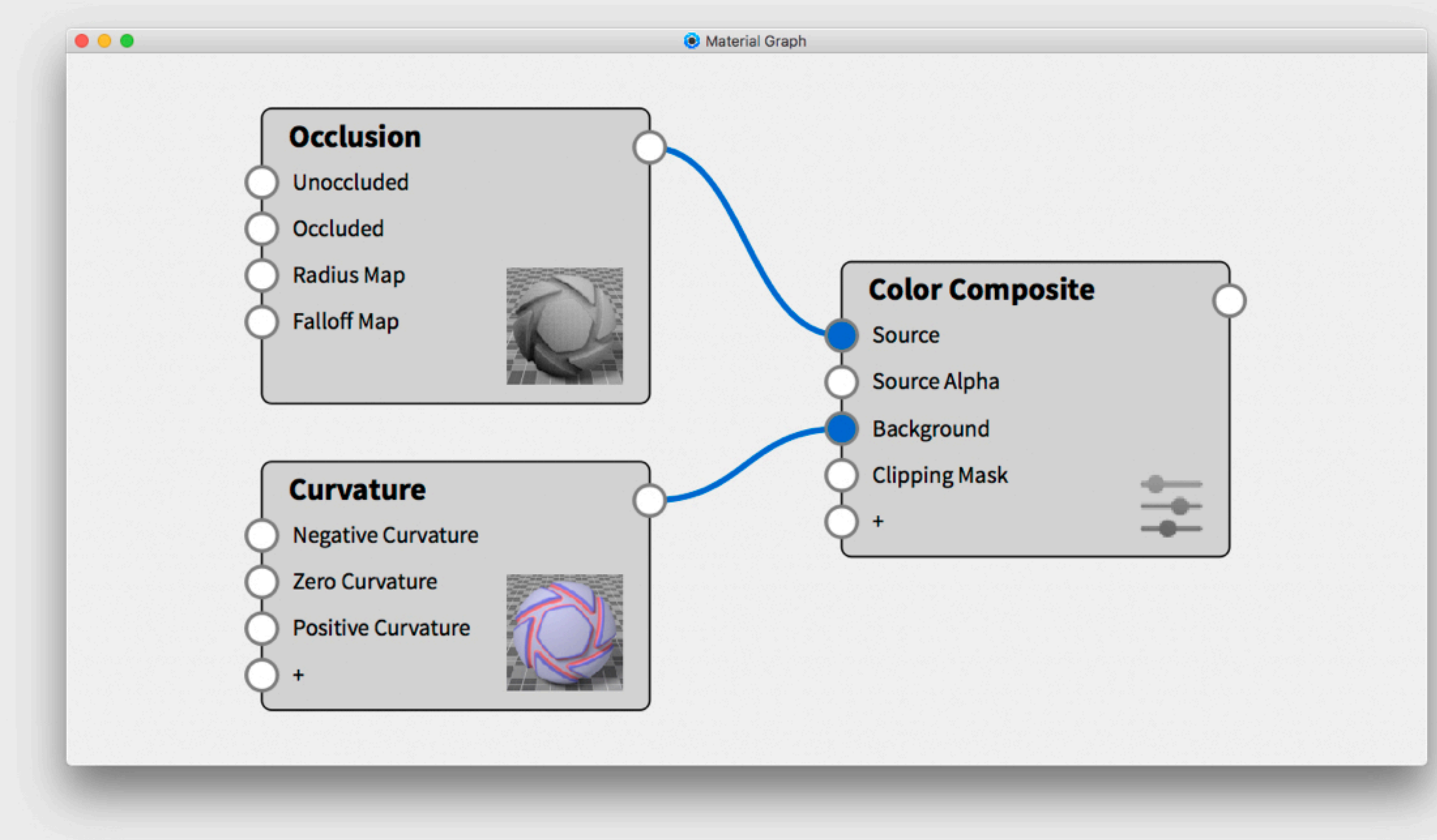
Source Alpha: Opacity channel or layer mask for Source

Background: Think of as background layer

Background Alpha: Opacity channel or layer mask for Background

Blend Mode: Determines how Source and Background will interact with each other

[Learn more about Blend Modes \(Wikipedia\)](#)







**Occlusion Procedural**



**Curvature Procedural**



**(Color Composite Node)**





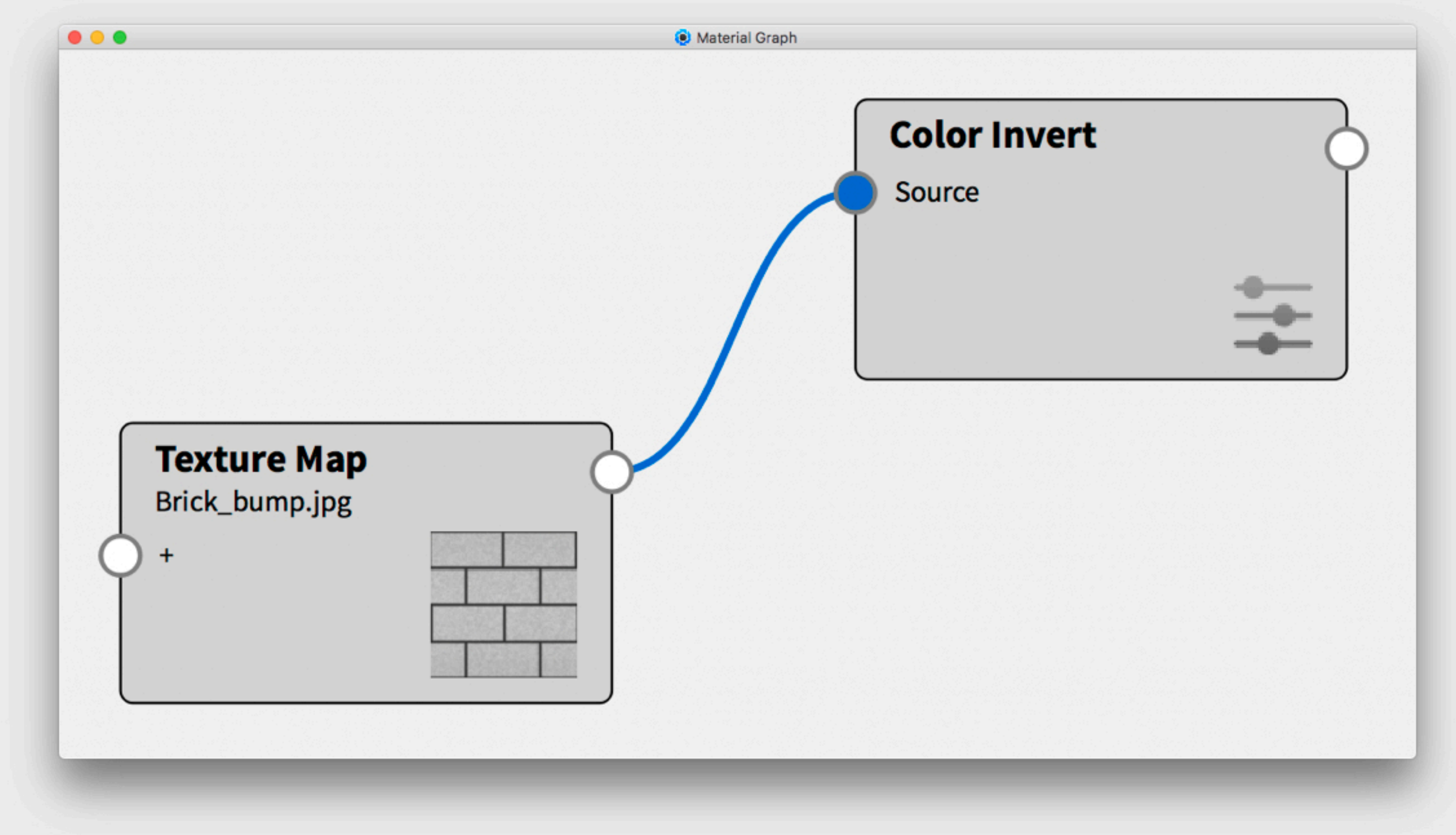


# Color Invert

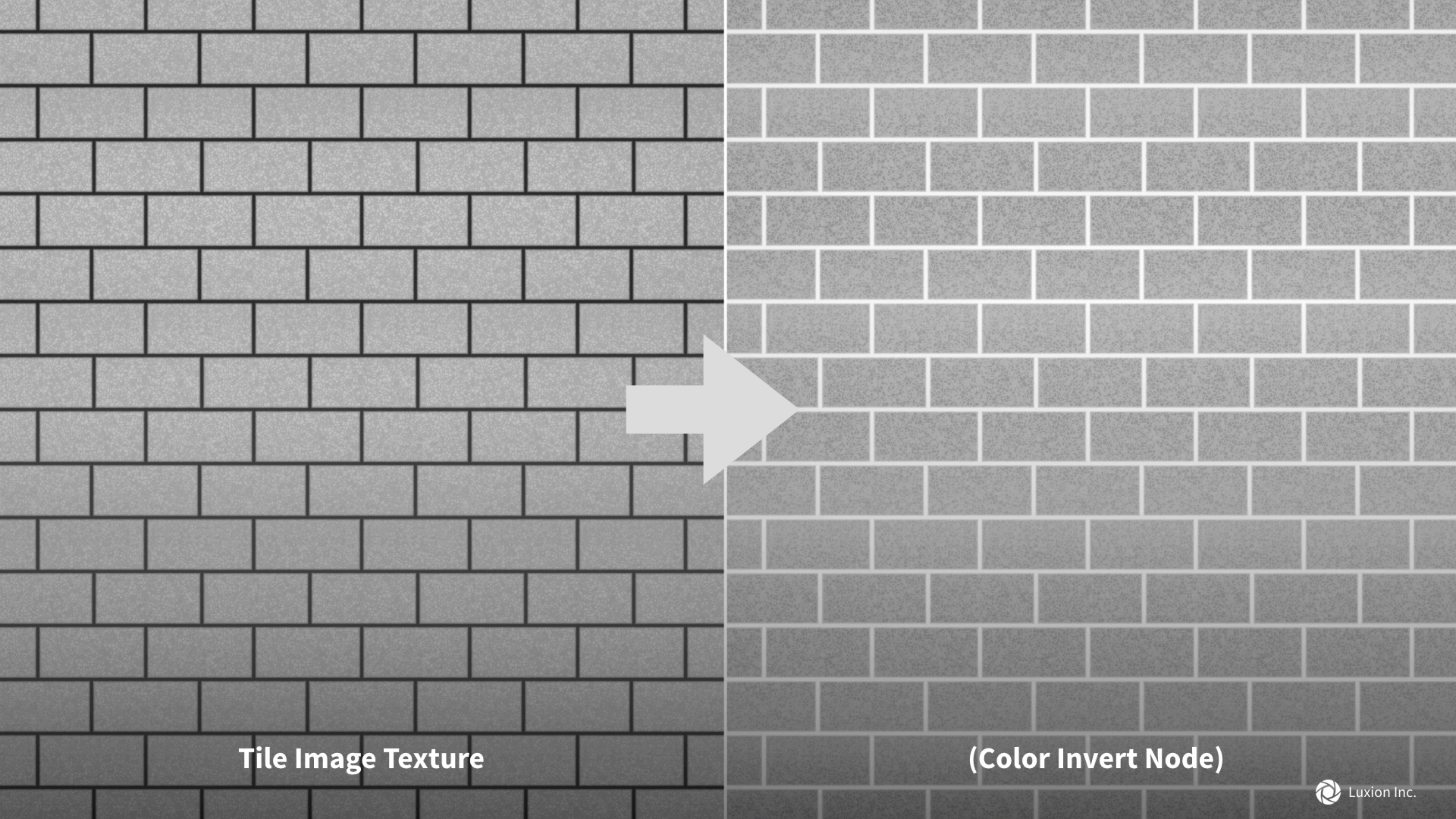
- *Multiply the color values by -1*
- *Ex. Turn black to white and vice versa*

## Properties

Source: Anything connected to the source input will be inverted







**Tile Image Texture**

**(Color Invert Node)**







# Color Key Mask

- Turn a specific color from a texture map into an opacity mask
- Ex. Make an opacity mask from a specific color

## Properties

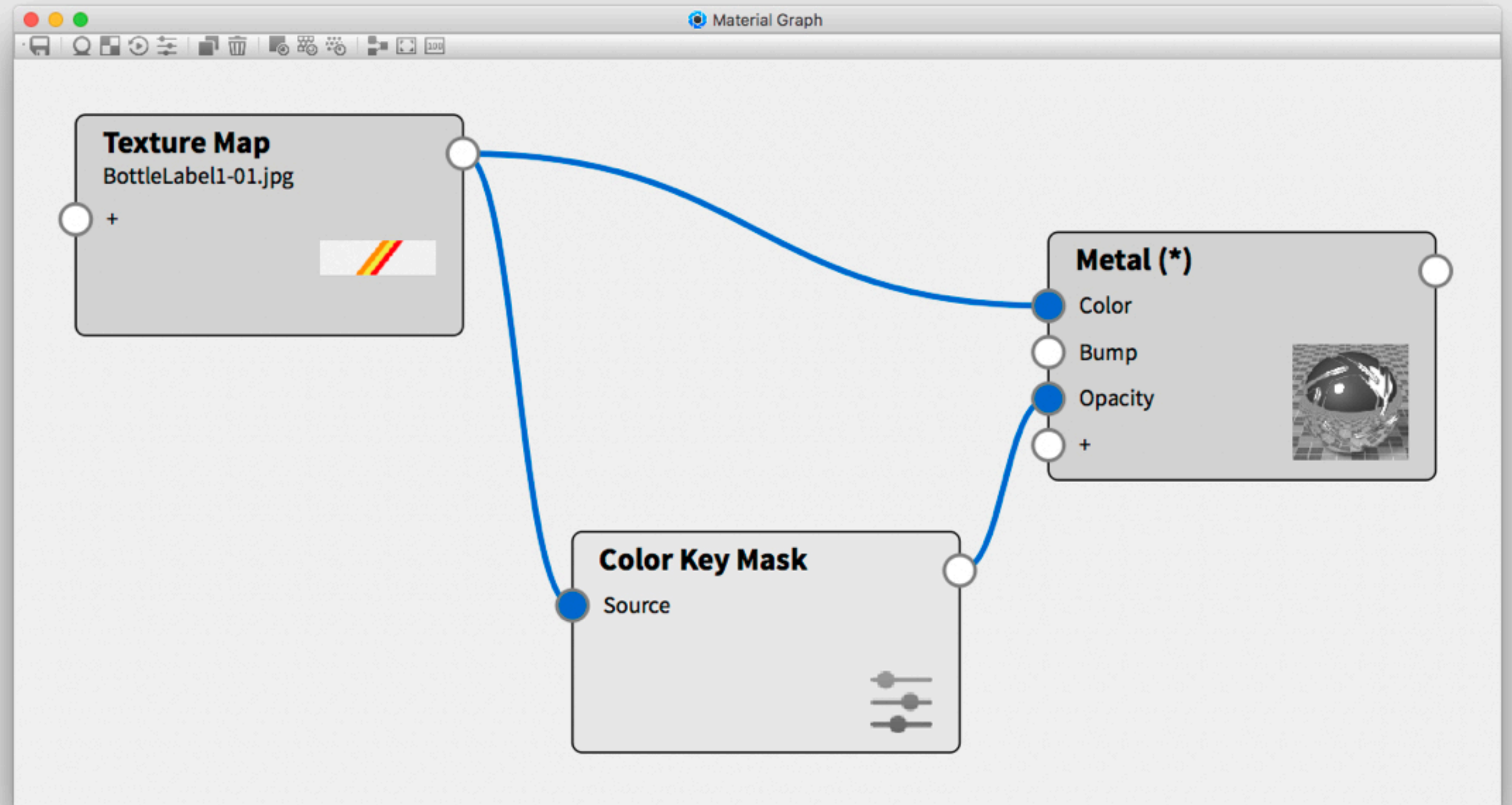
Connect texture to Source Input

Connect Color Key Mask output to Opacity of the material to be masked

**Color Key:** The color that will be turned into an opacity mask

**Threshold:** Specify minimal percentage of Color Key required before masked  
Ex. 1 = exact match

**Fuzziness:** Controls blending of what is and isn't included in the selection







**Image Texture**

**(Color Key Mask Node)**

**Masked Label**





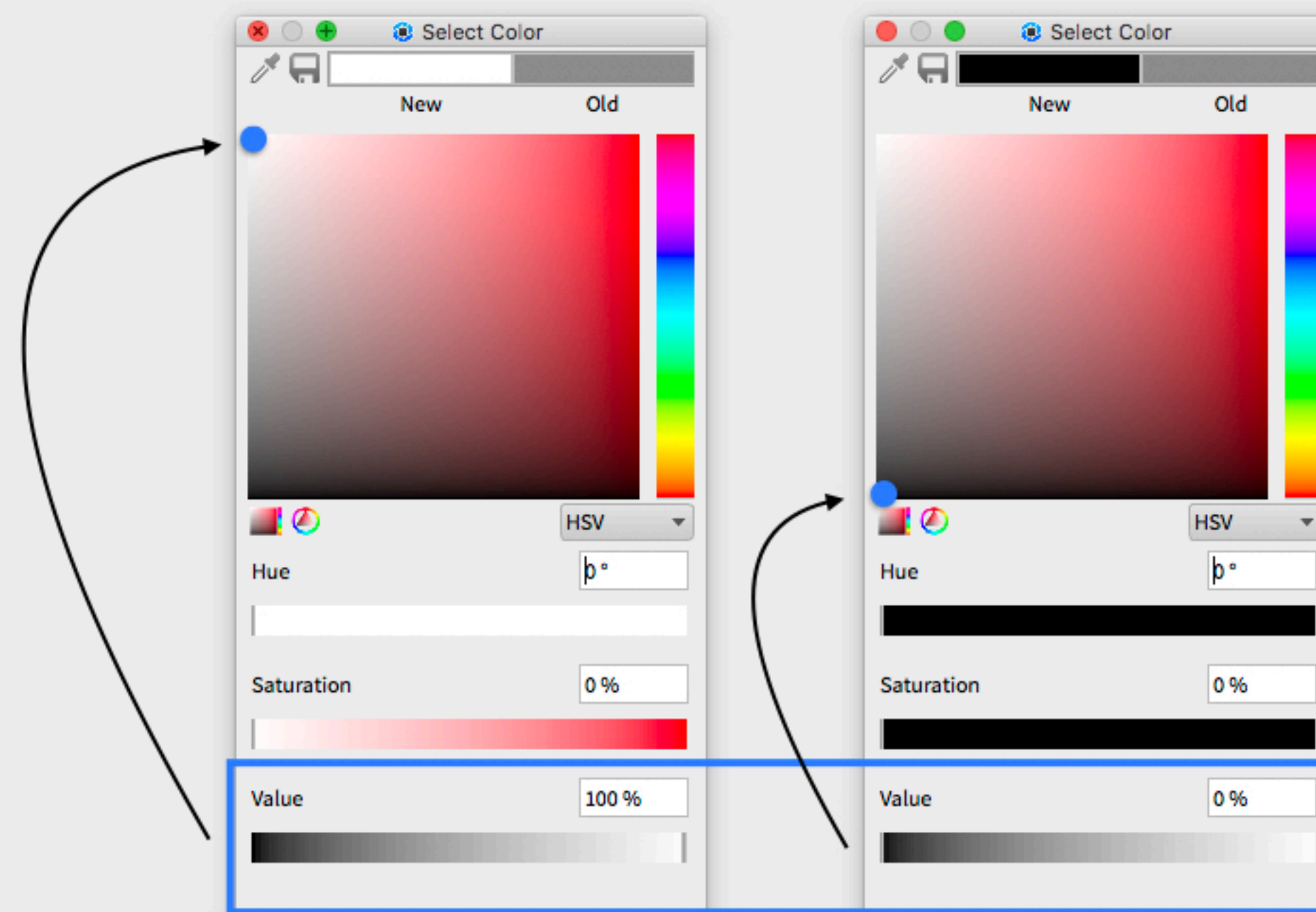


# KeyShot Values

Two kinds of value:

- **Grayscale:**  
(amount of white in a color)  
From 0% to 100%
- **Numerical:**  
Ex. 1, 2, 3 etc.

*Often, values can be defined by 'color',  
in which case, pure white = 1 and pure  
black = 0*

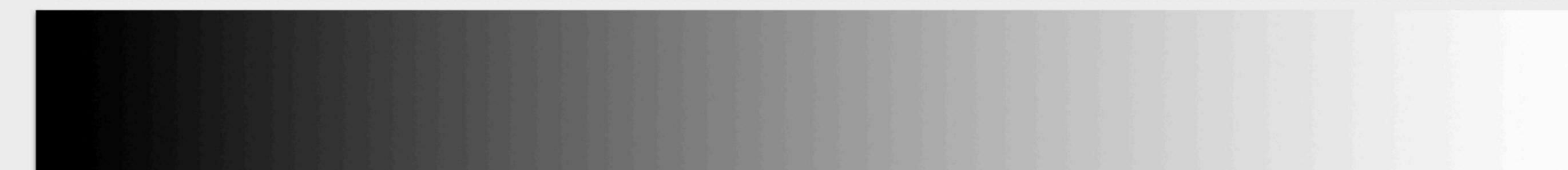


**Grayscale Value**

0%

50%

100%



0

.5

1

**Numerical Value**



# Color to Number

- *Convert value ranges into numerical values*
- *Ex. Make fine-tuned adjustments to roughness maps*

## Properties

Input From: Minimum input value

- 0 = 100% black

Input To: Maximum input value

- 1 = 100% white

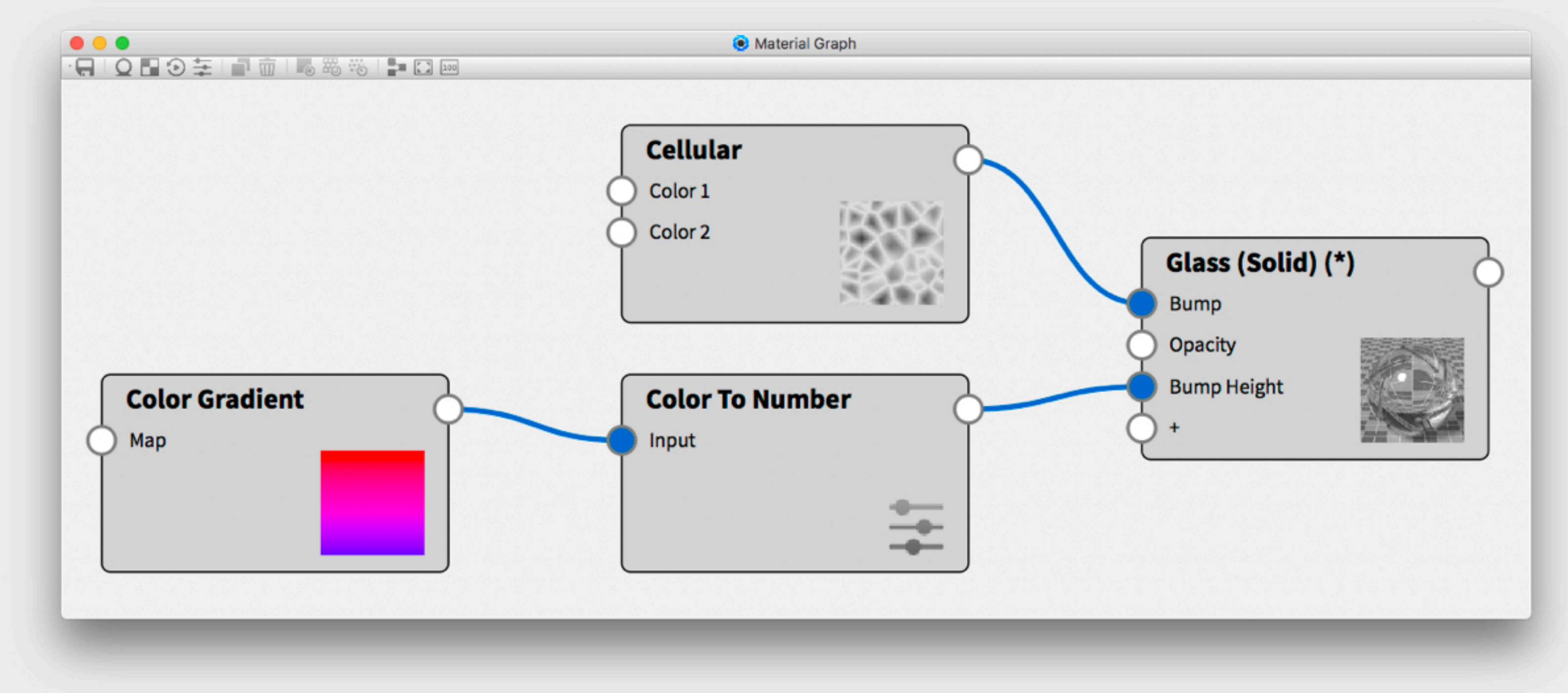
Output From: Minimum output value

- 0 = 100% black

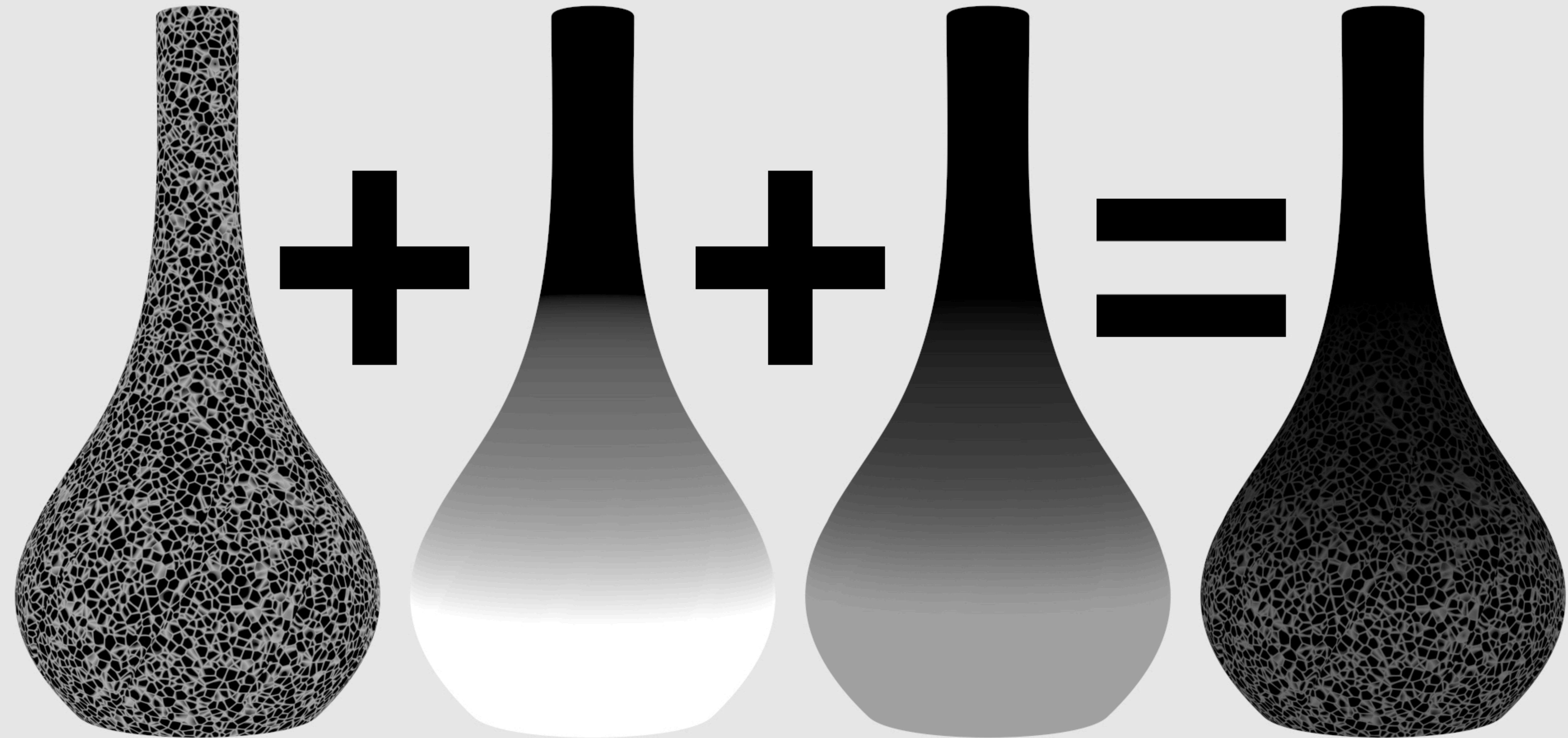
Output To: Maximum output value

- 1 = 100% white

Smooth: Applies an S-curve to value range







**Cellular  
Procedural Texture**

**Color Gradient  
Procedural Texture**

**(Color to Number  
Utility Node)**

**Bump Height**







# Color Fade

- *Transition from one color to another*
- *Ex. Show different color, finish or material option*

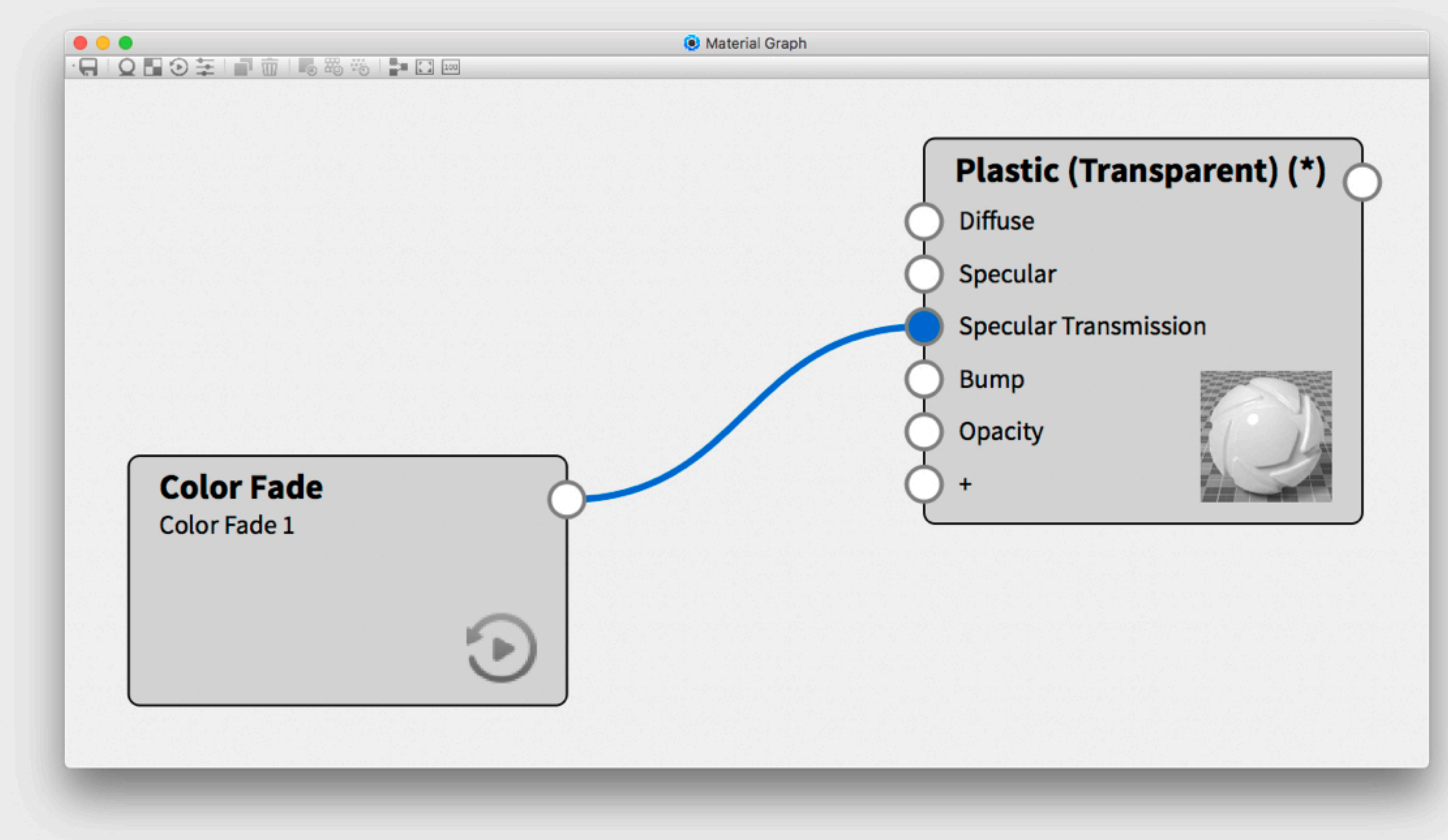
## Properties

Left Color: Beginning color

Right Color: Ending color

Time: Timestamp at which the selected color is fully realized

Click + icon to add new color, drag color drop to position





# Color Fade Node





# Number Fade

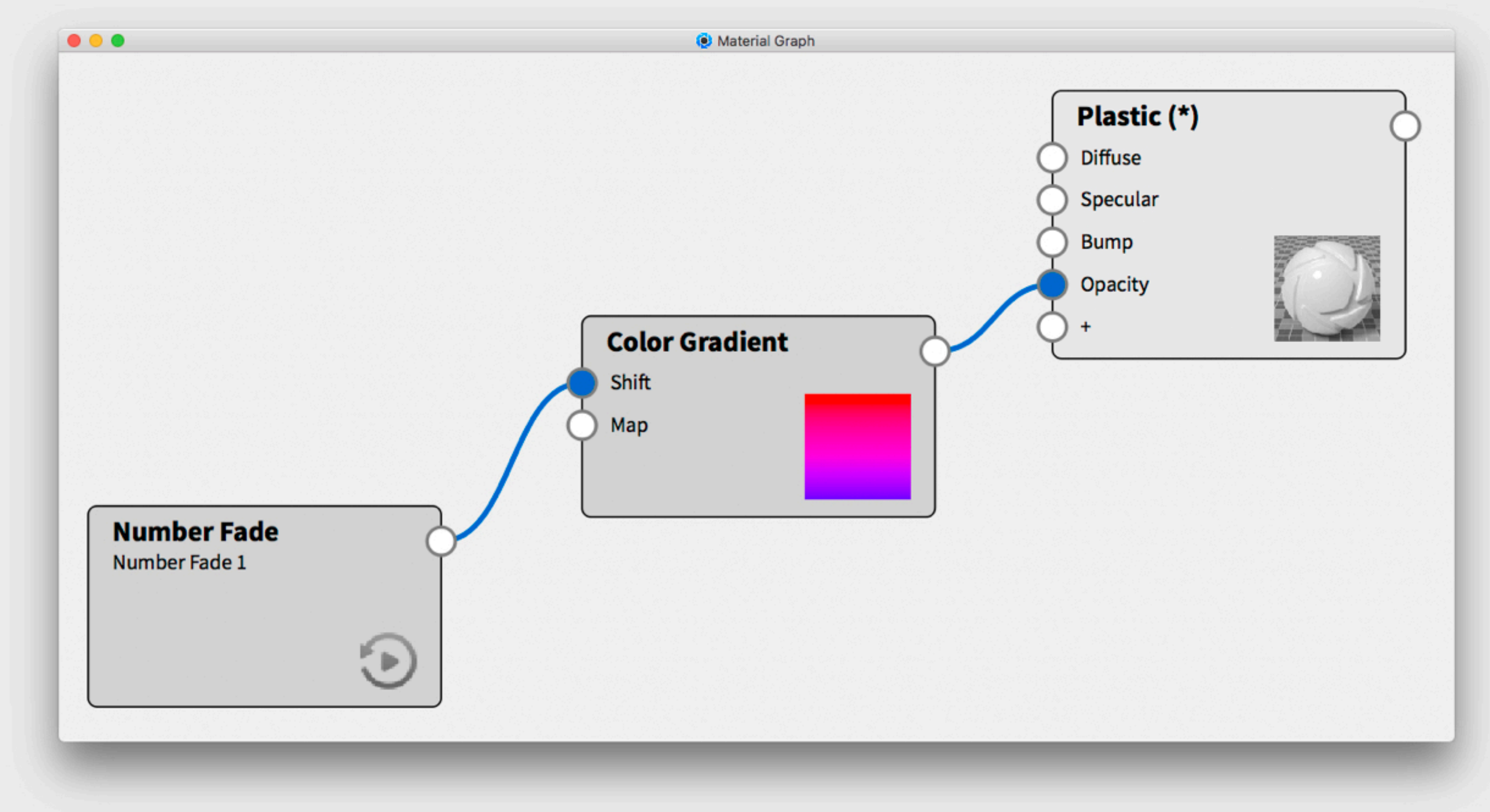
- *Transition from one value to another*
- *Ex. Scale a texture or label*

## Properties

From: Beginning value

To: Ending value

Time Settings: Control duration of fade





# Number Fade Node





# Hands On



# Q&A