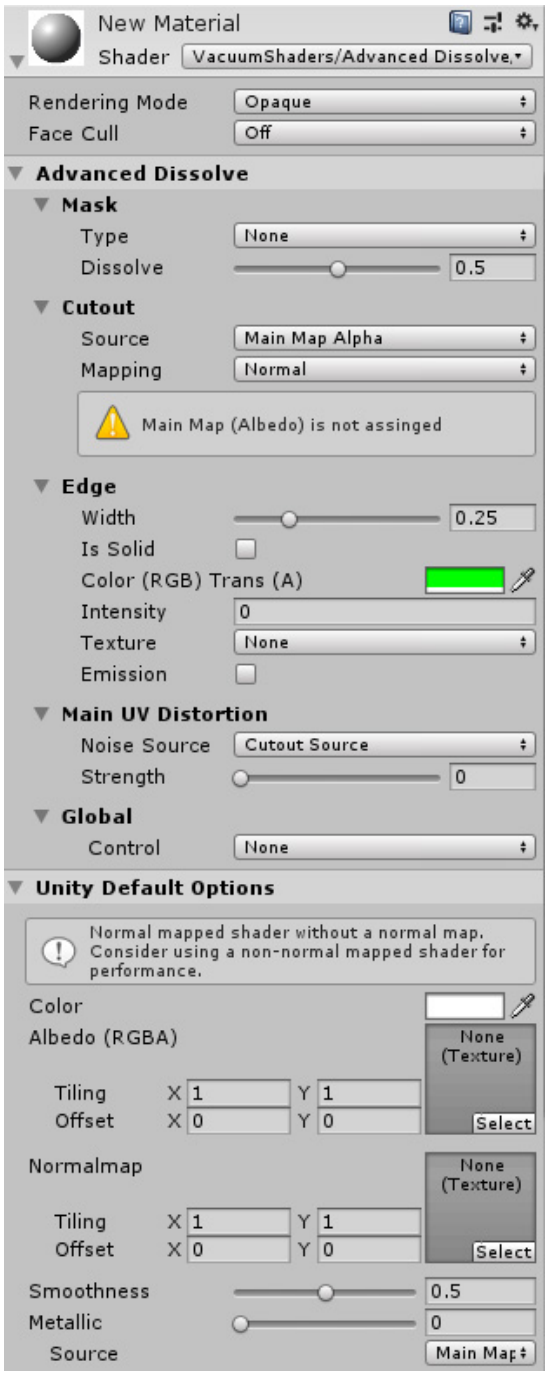
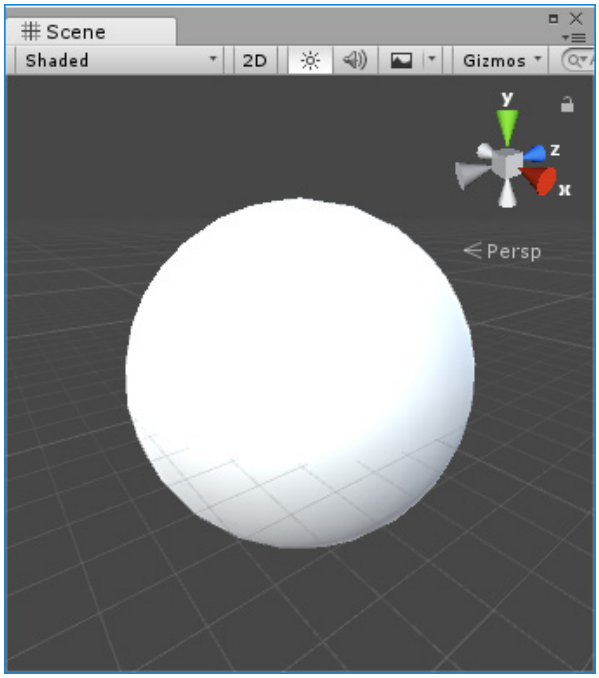
Quick Start

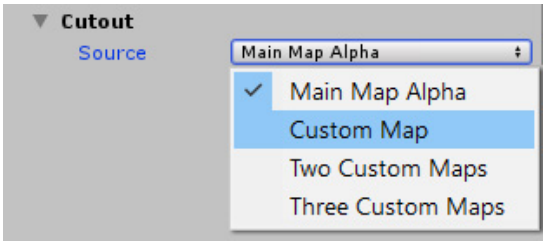
Create simple sphere and assign new material with Advanced Dissolve shader.
No dissolve effect at this stage.

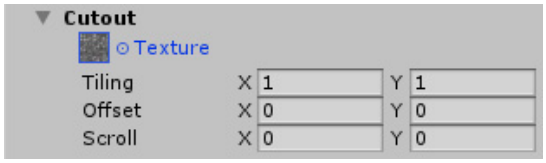




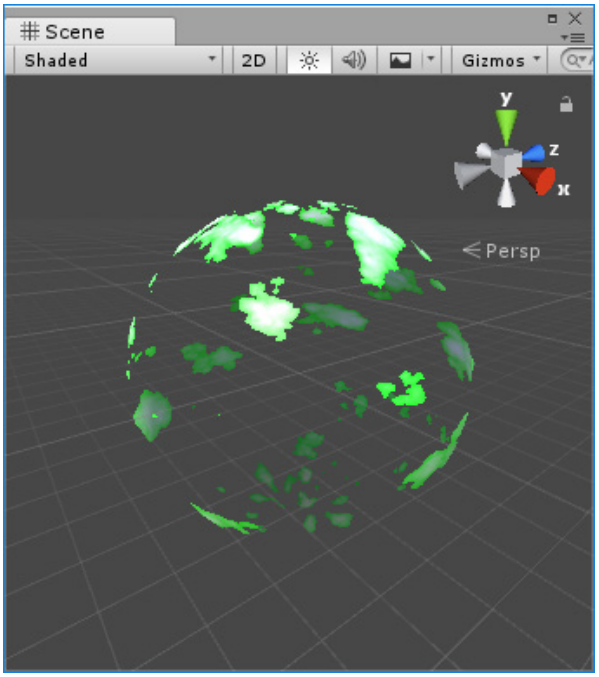
By default shader expects cutout value from the MainMap's alpha channel.

We can assign MainMap texture or tell shader to use **Custom Map**. Choose **Custom Map** option and select one of the included dissolve textures (e.g. D_1.jpg).



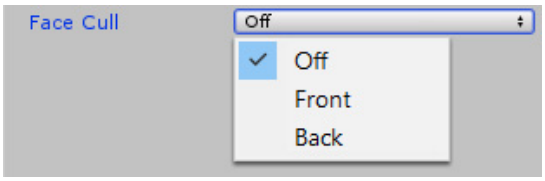


Now changing **Dissolve** parameter will animate cutout effect.

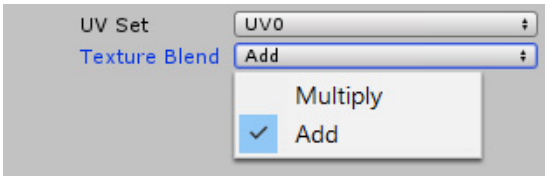


Note: Cutoff value is read from texture's Alpha channel.

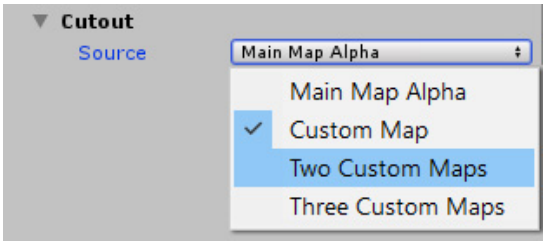
Note: Setting **Face Cull** option to **Off** will render both sides of a mesh.

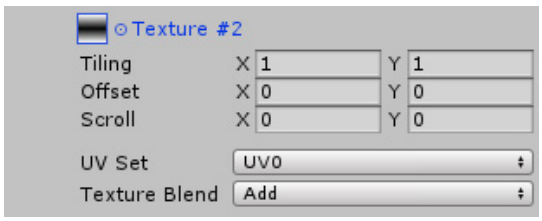


Advanced Dissolve shaders can use three textures simultaneously. They can be mixed by **Multiplying** or **Combining** (**Add**) alpha channel values.

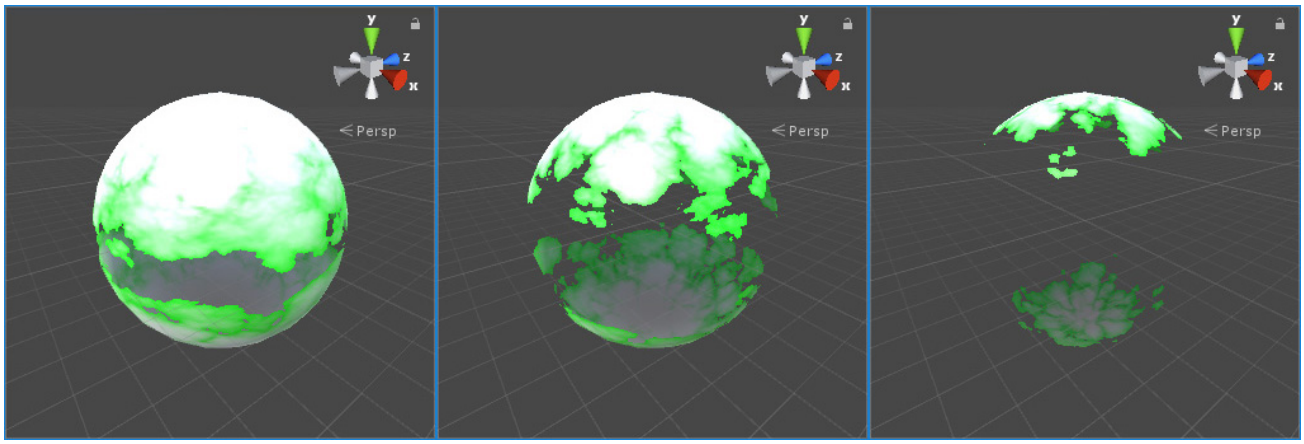


Choose **Two Custom Maps** option for **Cutout Source** and select grayscale ramp_H1.jpg for the second texture. Leave **Texture Blend** option to be **Add**.

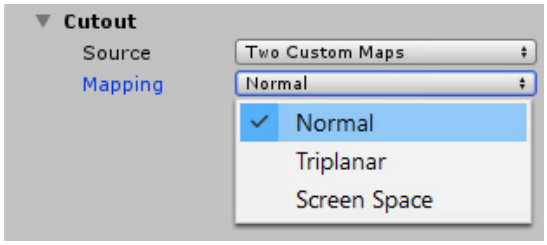




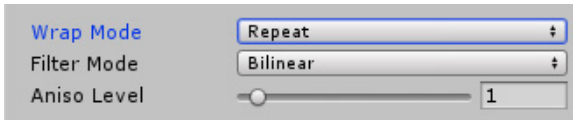
Changing **Dissolve** option will cutoff the middle part of a mesh moving toward top and bottom.



Experiment with various textures, blend and **Mapping** modes.



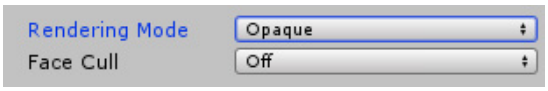
Note: Cutout textures can be animated by **Scroll** parameter, but make sure **Wrap Mode** is set to be **Repeat** inside Texture Import settings.



Check **1. Show room (Global Illumination)** example scene for various texture blend samples.

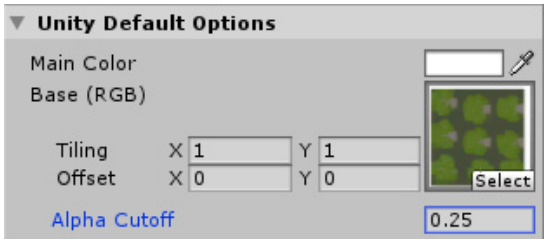
Note: Example scene uses dynamic global illumination and is not optimized for mobiles.

Rendering Mode and Face Cull



Advanced Dissolve shaders support three rendering modes:

- **Opaque** – Is the default, and suitable for normal solid objects with no transparent areas.
- **Cutout** – With this option enabled, MainMap will have its own **Alpha Cutoff** parameter.



  Allows you to create a transparent effect that has hard edges between the opaque and transparent areas. In this mode, there are no semi-transparent areas, the texture is either 100% opaque, or invisible. This is useful when using transparency to create the shape of materials such as grass, hair or objects with holes and tatters.
- **Fade (Transparent)** – Allows the transparency values to entirely fade an object out, including any specular highlights or reflections it may have. This mode is useful if you want to animate an object fading in or out.
  Shadows will not be renderer (Standard shaders are exception).

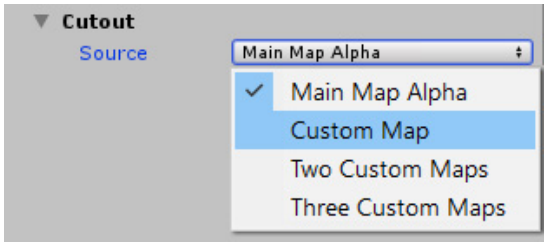
Face Cull:

- **Back** – Don't render polygons facing away from the viewer (default).
- **Front** – Don't render polygons facing towards the viewer. Used for turning objects inside-out.
- **Off** - Disables culling. All faces are drawn. Used for achieving simple double sided effect. May not be suitable for transparent materials.

Mask

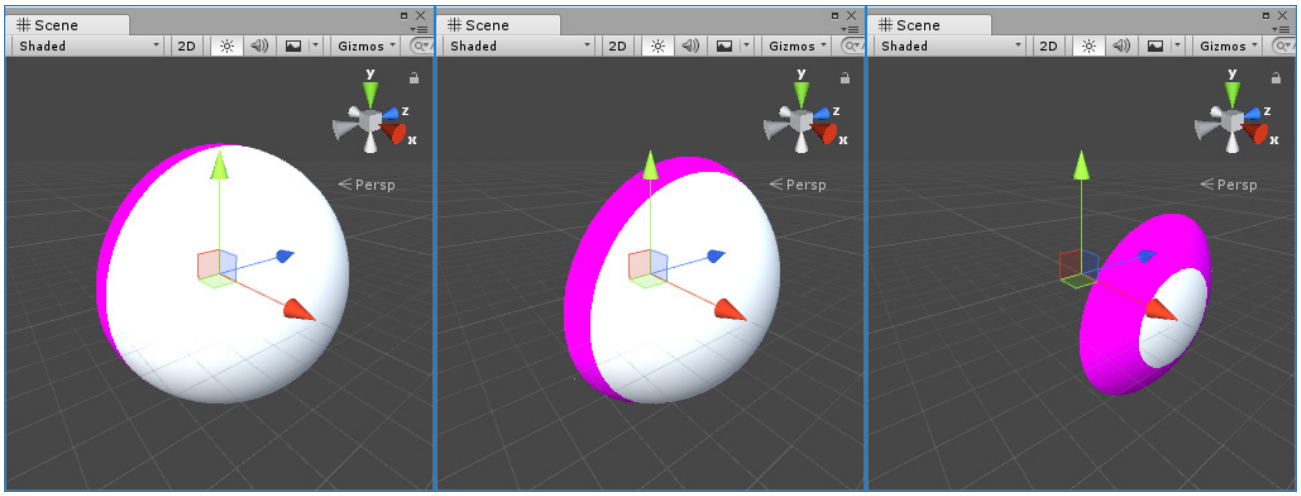
Controls dissolve effect amount and shape.

- **None** – Is the default. **Dissolve** parameter controls cutout effect amount.
  Note: **Cutout Source** textures alpha channel defines cutout shape.



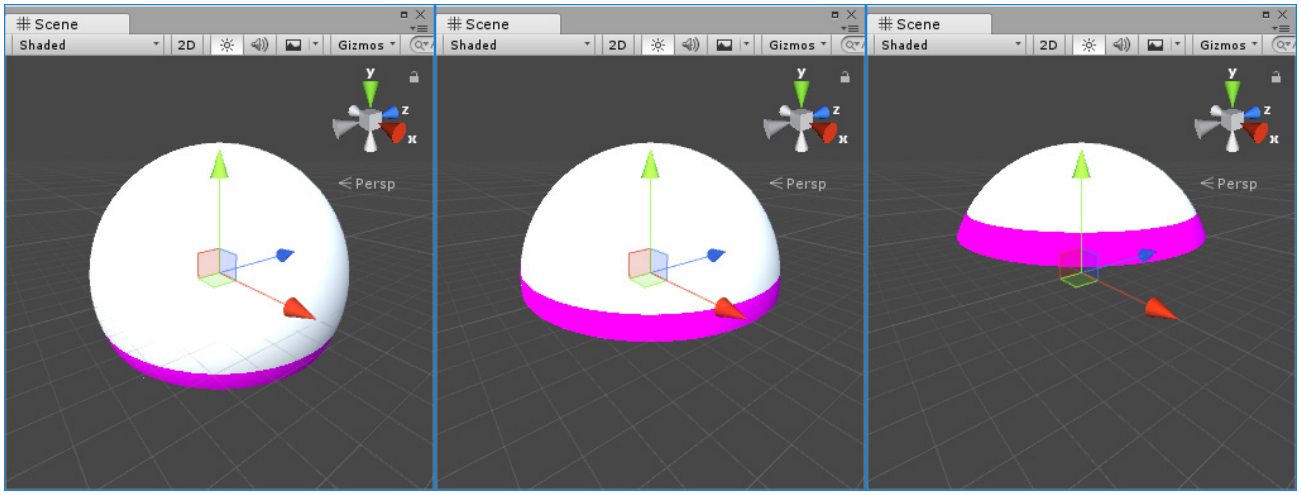
- **XYZ Axis** – Pixel is cutoff based on its World (or Local) X, Y and Z component values.

  X Axis example: All pixels which world position X value is less than **Offset** parameter are completely cutoff.



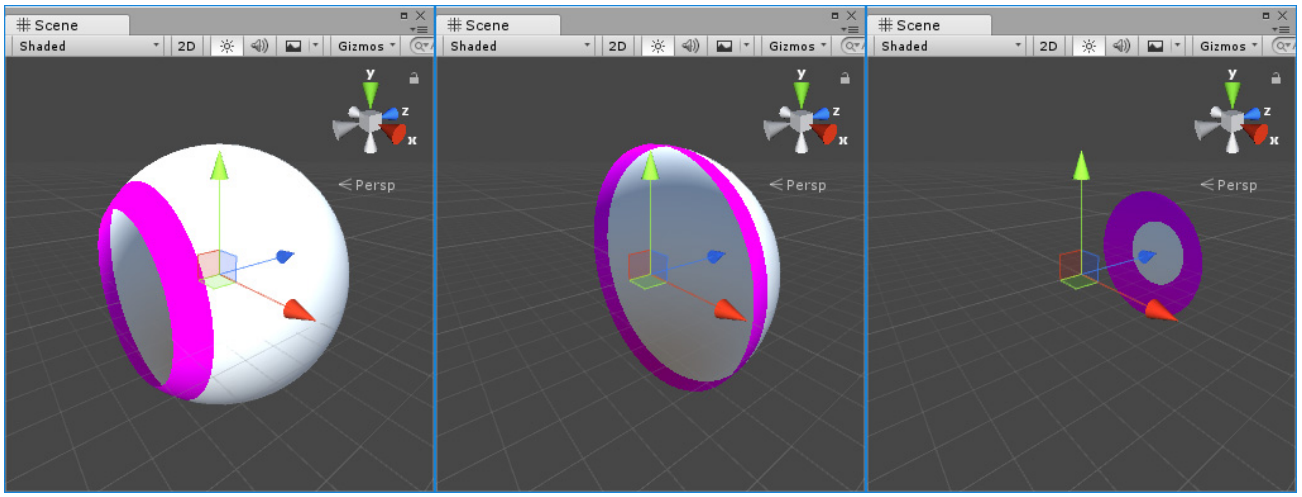
(Offset: 0) (Offset: 0.2) (Offset: 0.4)

Y Axis example:



(Offset: -0.2) (Offset: 0) (Offset: 0.2)

Z Axis example:



(Offset: -0.4) (Offset: 0) (Offset: 0.4)

Check **2. Mask (XYZ Axis)** example scene.

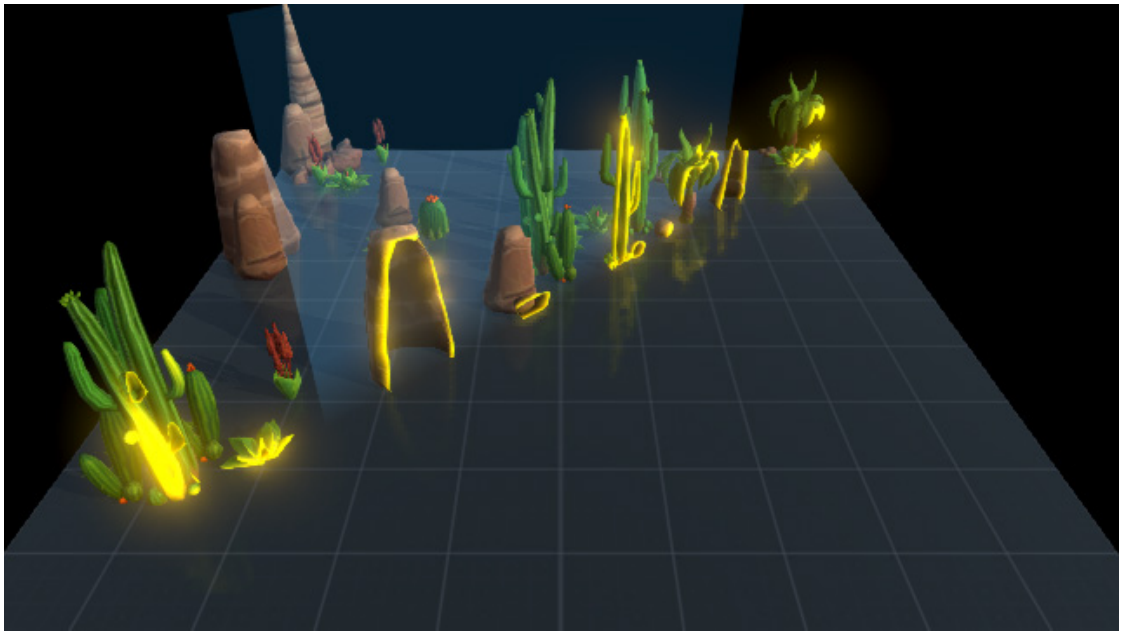
All mask types bellow have no parameter controllers inside material editor and expects them to be updated from custom script.

Simultaneously can be used only 4 mask objects.

For each mask type package includes separate example scenes and controller scripts.

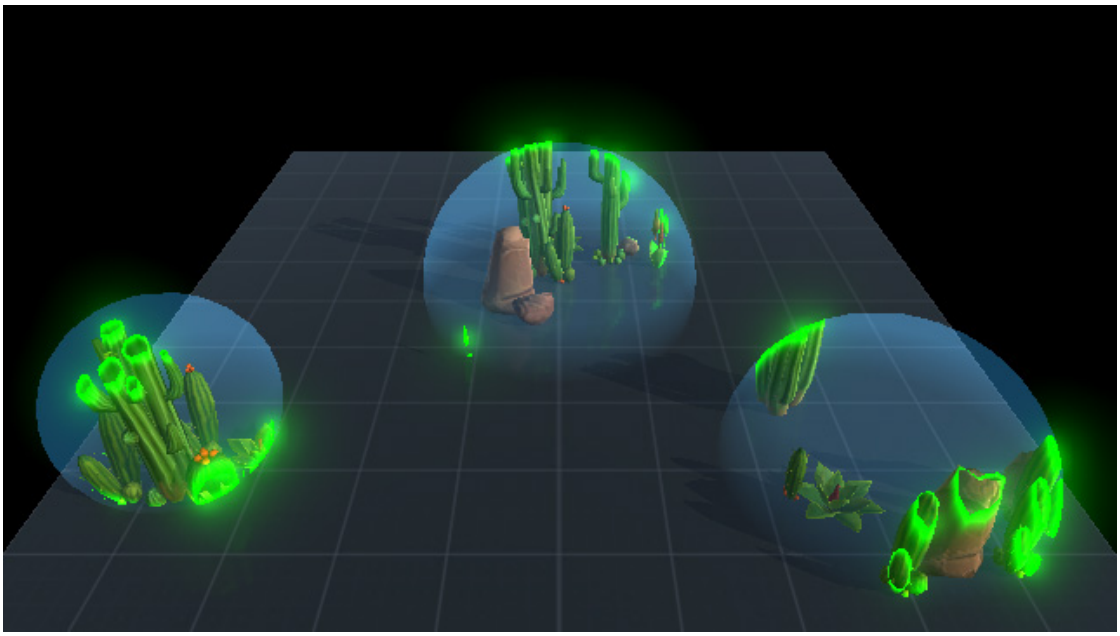
- **Plane** – Pixel visibility is defined by *'plane'* position in the scene and its normal direction. Shader requires *'plane'* **Position** and **Normal** to be updated from script.

  Check **3. Mask (Plane)** example scene and **Controller_Mask_Plane** script used there for updating shader parameters.



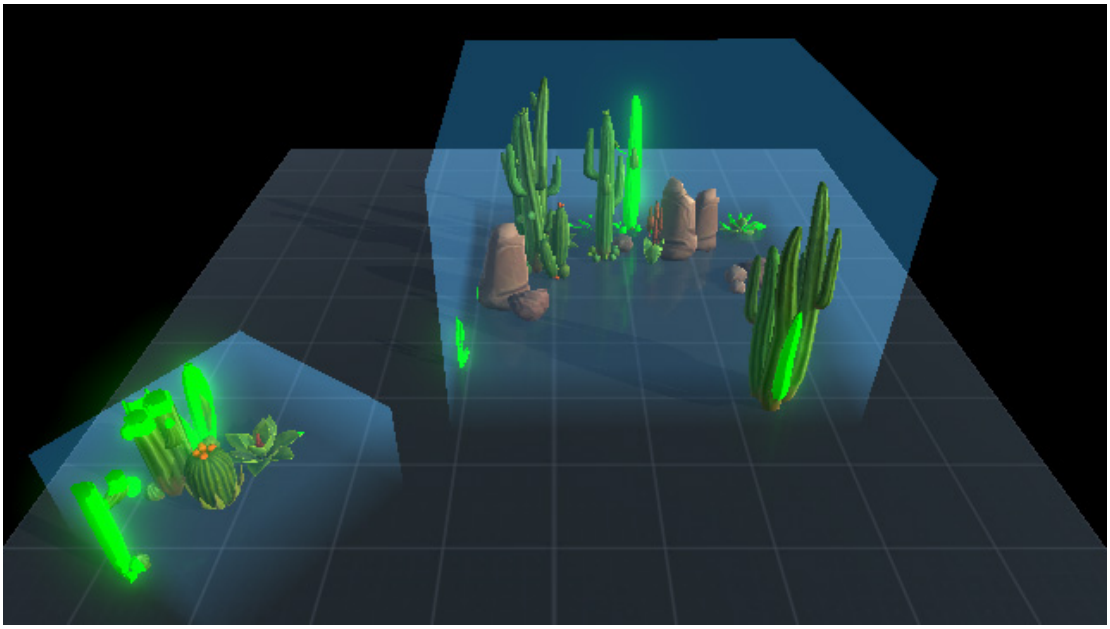
- **Sphere** – Pixels inside *'sphere'* are visible only. Shader needs *'sphere'* **Position** and **Radius** to be updated from script.

  Check **4. Mask (Sphere)** example scene and **Controller_Mask_Sphere** script used there for updating shader parameters.



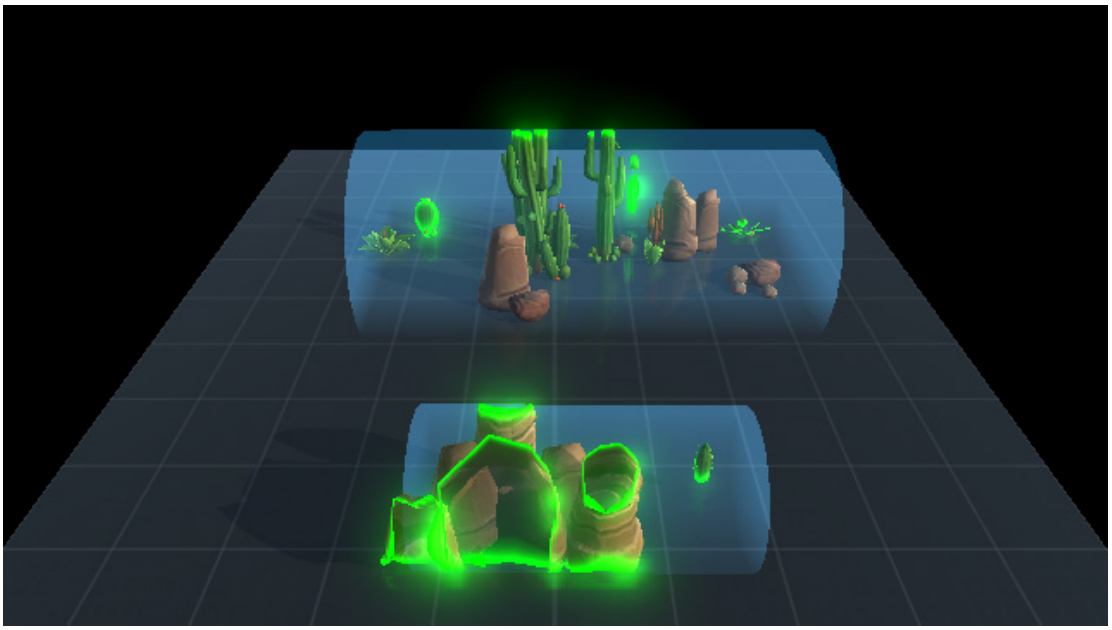
- **Box** – *'Box'* mask object requires calculation of its **Bound Box** and **Transformation Matrix** inside script.

  Check **5. Mask (Box)** example scene and **Controller_Mask_Box** script used there for updating shader parameters.



- **Cylinder** – Requires: **Position**, **Normal Direction**, **Height** and **Radius**, to be updated from script.

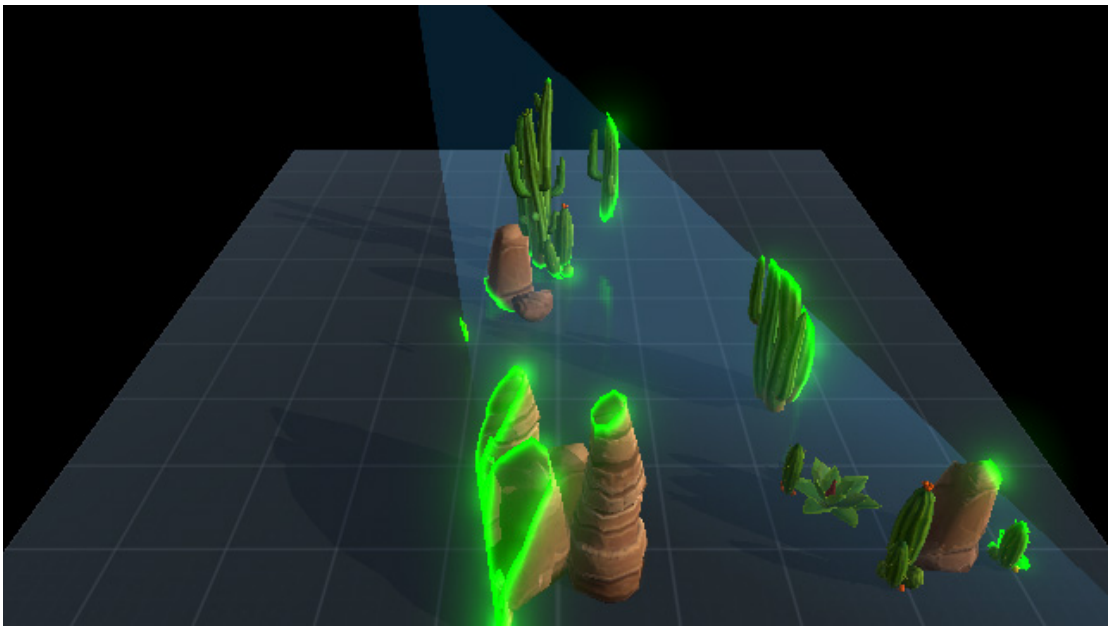
  Check **6. Mask (Cylinder)** example scene and **Controller_Mask_Cylinder** script used there for updating shader parameters.



Note: example script uses Unity built-in cylinder mesh and converts its transform properties into shader 'friendly' form.

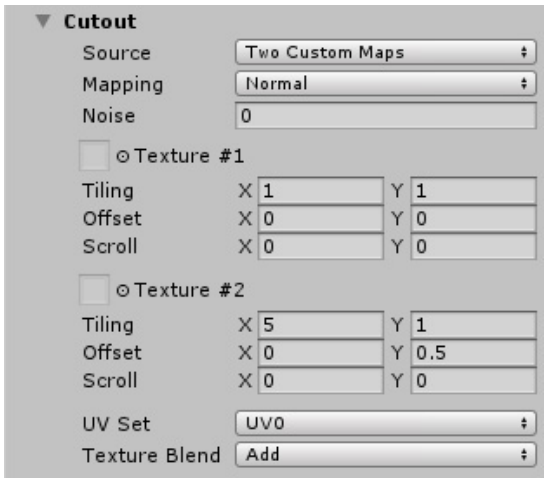
- **Cone** – Requires: **Position**, **Normal Direction**, **Height** and **Radius**, to be updated from script.

  Check **7. Mask (Cone)** example scene and **Controller_Mask_Cone** script used there for updating shader parameters.

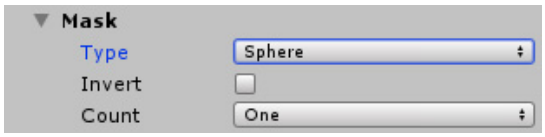


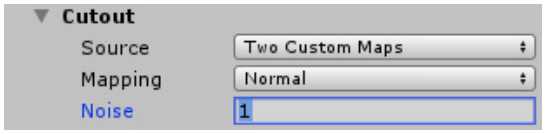
Note: example script uses Unity built-in spot light and converts its transform properties into shader 'friendly' form.

Cutout



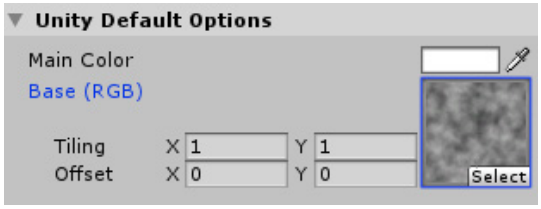
Properties in Cutout group define shape of dissolve effect.
If **Mask** is enabled, it becomes edge noise controlled by **Noise** parameter.



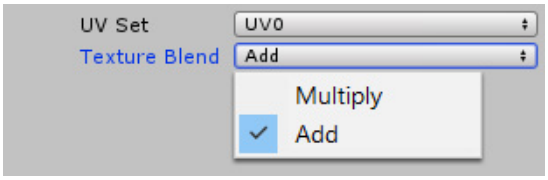


Source:

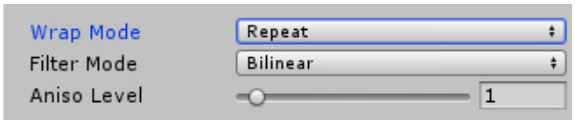
- **Main Map Alpha** – Dissolve cutout values are read from the MainMap alpha channel.



- **Custom Maps** (One, Two Three) – Custom dissolve textures. Can be animated using **Scroll** parameter and mixed by **Multiplying** or **Combining** (**Add**).

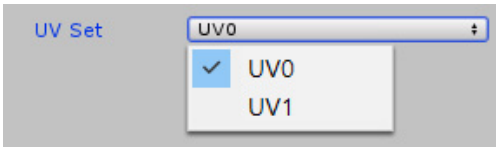


Note: Cutout textures can be animated by **Scroll** parameter, but make sure **Wrap Mode** parameter is set to be **Repeat** inside Texture Import settings.



Mapping:

- **Normal** – Cutout textures are sampled by mesh UV coordinates. Optionally can be used UV0 or UV1 layout.



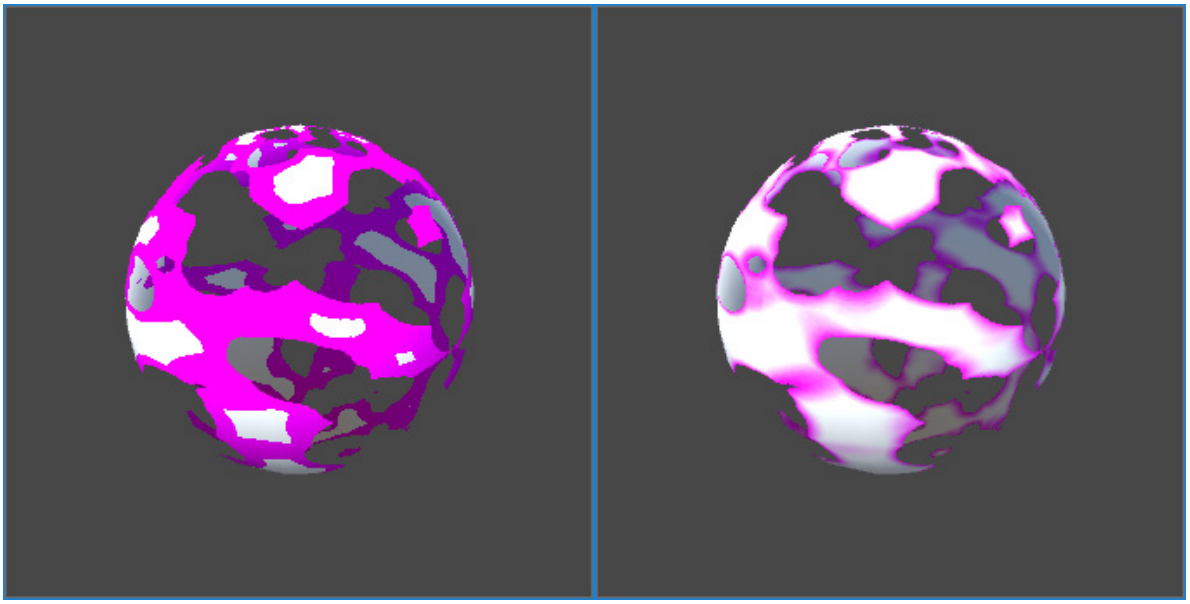
- **Triplanar** – Triplanar map projection. No mesh UV coordinates are required. Note: 1 texture projection requires 3 texture sampling.

- **Screen Space** – Textures are sampled in screen space coordinates. No mesh UV coordinates are required.

Edge

Controls visual appearance of the edge.

- **Width** – Controls dissolve edge size.
- **Shape** – Edge color can be solid or smooth (blending with background).

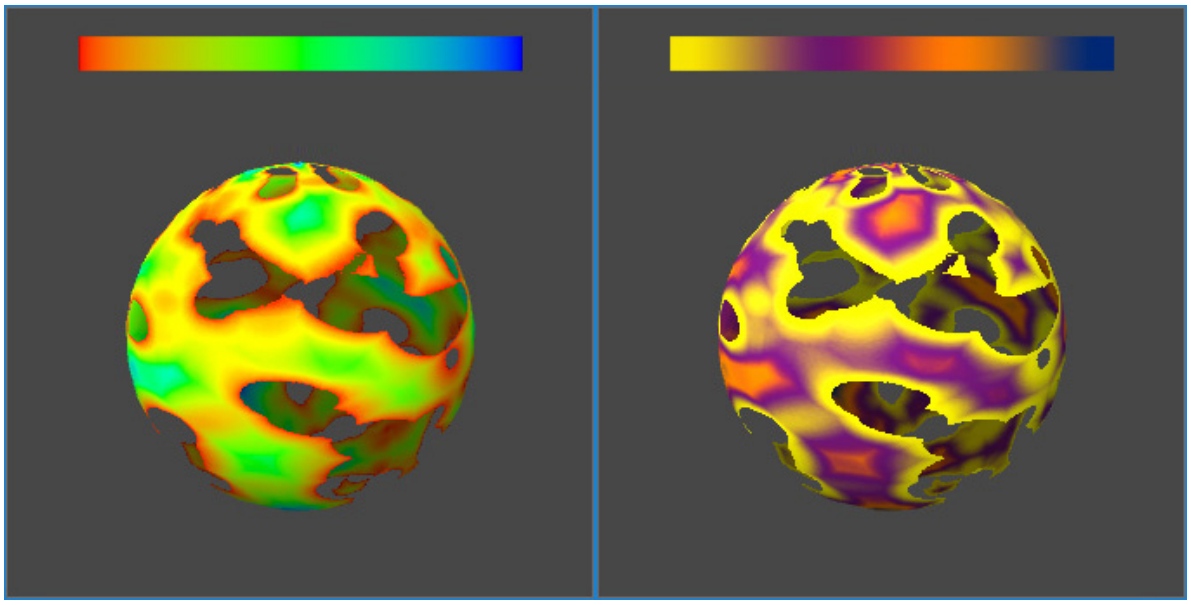


(Solid) (Smooth)

- **Color** – Dissolve edge color. Alpha channel effects transparency.
- **Intensity** – Makes dissolve edge color emissive.
- **Texture** – Additional control over dissolve edge color.

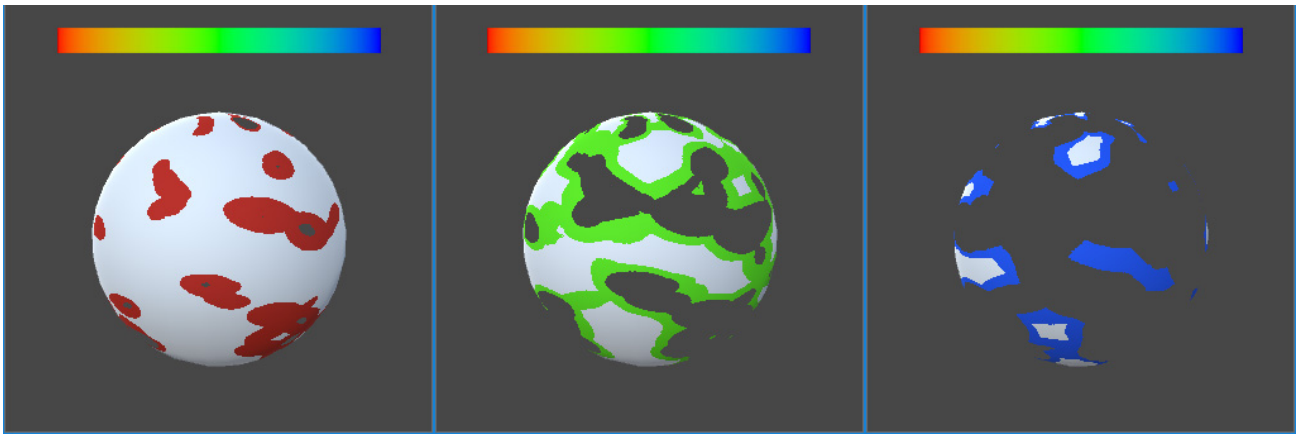
  Note: All textures alpha channel effects edge transparency. It can be adjusted by **Alpha Offset** parameter.

  1. **Gradient** – Ramp texture is used for calculating edge color.



  Texture can be animated with **Phase Offset** parameter, but it needs texture with **Repeat** wrap mode inside Texture Import settings.

If **Is Dynamic** checkbox is enabled and **Mask** is not used, then edge color depends on **Dissolve** parameter value read as a **V** (from uv) coordinate of a Ramp texture.



(Dissolve: 0.1) (Dissolve: 0.5) (Dissolve: 0.9)

If **Mask** is enable dynamic gradient effect can be achieved by animating **Dissolve** property `_DissolveCutoff` from custom script.

2. **Main Map** – Dissolve edge color is multiplied by MainMap color.
3. **Custom** – Custom color texture. UV coordinates are the same as MainMap.

- **Emission** – Shader participates in Global Illumination system. Mesh must be **Static**. If option is enabled shader will need `_Dissolve_ObjectWorldPos` variable update from a custom script (dissolve color illumination is calculated inside shader Meta pass that has no info about mesh position).

  Check **1. Show room (Global Illumination)** and **AnimateCutout** script used there. It updates shader `_Dissolve_ObjectWorldPos` parameter and GI system.

Main UV Distortion

Distorts main UV coordinates used by MainMap, BumpMap and other default textures.
Noise UV direction is read from MainMap or Cutout Source textures Red and Green channels.

Note: Textures alpha channel is used for dissolve effect.

Global Control

All material properties in Advanced Dissolve shaders can be controlled from custom scripts. If multiple materials need similar shader values it is better to use **Global** properties.

Check **8. Global Controller** example scene.
All objects here use the Plane mask. By default we would need to create “for” loop inside script and update mask parameters for all scene materials.
But mask parameters (position and normal direction) are the same for all materials.
By setting global controller to **Mask Only** we have to update Plane mask properties only once and all materials will use that values.

Shader global parameters are updated by Shader.SetGlobalVector and Shader.SetGlobalFloat methods from script.

Package includes scripts for updating global properties for all groups of Advanced Dissolve shaders (path: `Assets\VacuumShaders\Advanced Dissolve\Example Scenes\Files\Scripts\Controllers`).

Global variable has the same names as non-global but with “**_Global**” in the end.
E.g. `_DissolveMaskPosition` and `_DissolveMaskPosition_Global`,
`_DissolveMaskNormal` and `_DissolveMaskNormal_Global`

Note: Global controller updates only variable parameters, they will be disabled (grayed out) inside material editor.
Shader keywords cannot be controlled globally and need to be modified manually using Material.EnableKeyword and Material.DisableKeyword methods.

Mask type keywords:

- **None -** `_DISSOLVEMASK_NONE`
- **XYZ Axis** - `_DISSOLVEMASK_XYZ_AXIS`
- **Plane** - `_DISSOLVEMASK_PLANE`
- **Sphere** - `_DISSOLVEMASK_SPHERE`
- **Box** - `_DISSOLVEMASK_BOX`
- **Cylinder** - `_DISSOLVEMASK_CYLINDER`
- **Cone** - `_DISSOLVEMASK_CONE`

Mask count keywords:

- **One** – `_DISSOLVEMASKCOUNT_ONE`
- **Two** – `_DISSOLVEMASKCOUNT_TWO`
- **Three** – `_DISSOLVEMASKCOUNT_THREE`
- **Four** - `_DISSOLVEMASKCOUNT_FOUR`

Cutout source:

- **Main Map Alpha** – `_DISSOLVEALPHASOURCE_MAIN_MAP_ALPHA`
- **Custom Texture** – `_DISSOLVEALPHASOURCE_CUSTOM_MAP`
- **Two Custom Textures** - `_DISSOLVEALPHASOURCE_TWO_CUSTOM_MAPS`
- **Three Custom Textures** - `_DISSOLVEALPHASOURCE_THREE_CUSTOM_MAPS`

Cutout source textures mapping keywords:

- **Normal** – `_DISSOLVEMAPPINGTYPE_NORMAL`
- **Triplanar** – `_DISSOLVEMAPPINGTYPE_TRIPLANAR`
- **Screen Space** - `_DISSOLVEMAPPINGTYPE_SCREEN_SPACE`

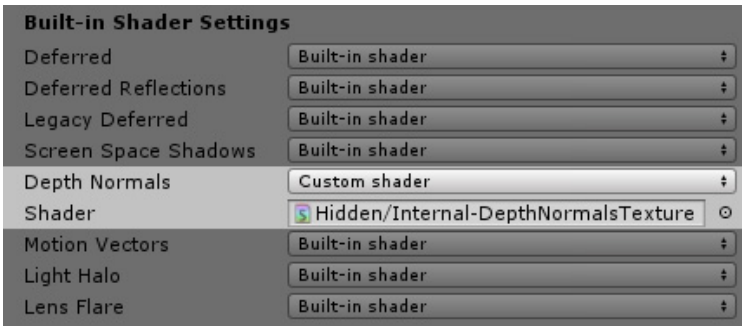
Edge color textures:

- **None** – `_DISSOLVEEDGETEXTURESOURCE_NONE`
- **Gradient** – `_DISSOLVEEDGETEXTURESOURCE_GRADIENT`
- **Main Map** - `_DISSOLVEEDGETEXTURESOURCE_MAIN_MAP`
- **Custom** - `_DISSOLVEEDGETEXTURESOURCE_CUSTOM`

Post Processing

Advanced Dissolve shaders are using custom RenderType described inside `Advanced Dissolve/Shaders/Internal/Internal-DepthNormalsTexture.shader` file.

To make Advanced Dissolve shaders work with Unity Post Processing and Image effects use above shader instead of Unity's built-in one inside Graphics Settings.



Integration with Curved World (http://u3d.as/awm)

To integrate Advanced Dissolve shaders with Curved World follow steps described in **Advanced Dissolve/ Shaders/ cginc/ Integration_CurvedWorld.cginc** file.