

# Shaders and Textures in Artlantis 2.0

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In Artlantis, “Shaders” and / or “Textures” are used to define the aspect of materials.

In Artlantis there are a few procedural shaders that have a color for the diffuse (Basic, Expert, Fresnel Water, etc.) The majority of shaders have images to define the diffuse (Bricks, Wood...).

## 1/ Procedural Shaders

Procedural shaders (Basic or Expert) are recommended:

- for simple surfaces because they use very little memory,
- as a support for texture mapping

Basic and Expert shaders can simulate several surfaces.

“Basic” Shader sample: from matte to lacquer painting by changing the reflection and shininess:



*R=0 - S= 0  
Diffuse=green*



*R=0.2 - S=20  
Diffuse=green*



*R= 0.5 - S= 350  
Diffuse=green*



*R=0.5 - S=1000  
Diffuse=green*

“Expert” shader sample:

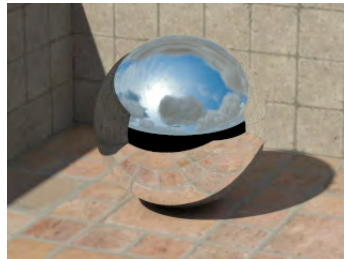
Aluminum, Steel, Chrome, Bubble



*Shininess=160  
Diffuse=Dark-gray  
Reflection=Gray*



*Shininess=400  
Diffuse=Black  
Reflection=Gray-blue*



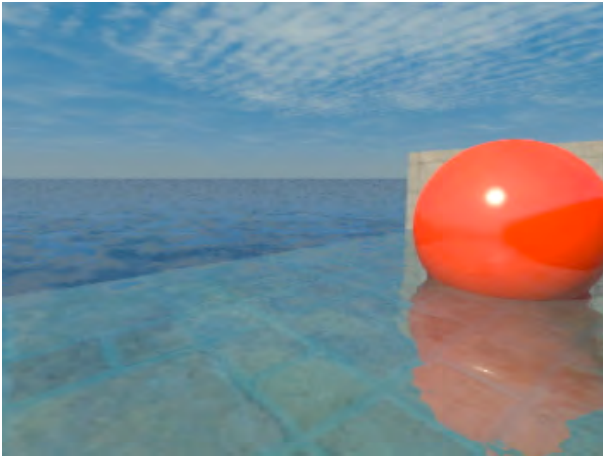
*Shininess=1000  
Diffuse=Black  
Reflection=white*



*Shininess=900  
Diffuse=Black  
Reflection=light gray  
Transparency=light gray*

Other procedural shaders (Fresnel Water, Fresnel Glazing, etc.) are used for specific cases, which cannot be simulated by others.

“Fresnel Water” shader sample:



## 2/ Image Shaders

Image Shaders are "pre-set" materials, ready to use. They have common behaviors:

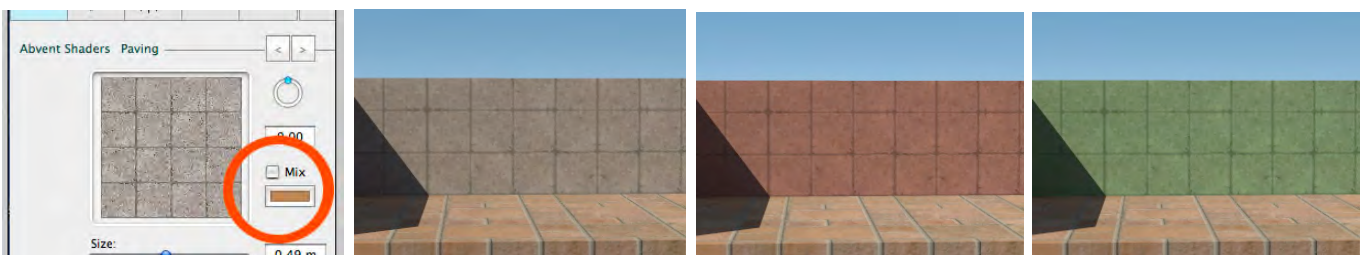
- Automatic repeat of the diffuse image file to cover the entire surface with a perfect tiling
- Sliders with minimum and maximum values are pre-set to prevent faulty settings, i.e. coating shaders have no reflection
- Unique and Simple user interface (Some image channels and parameters are hidden)
- Automatic scaling with the model

### The Mix Color:

The diffuse is defined by an image that has its own colors, but it is possible to modify this color with the "mix color" function.

This is an RGB color, and the neutral color is gray. Gray does not change the original picture aspect, even if the "Mix" box is checked.

Sample: changing the mix color on the wall in the back



*Mix Color in the UI*

*No mix*

*Mix=Brown*

*Mix=Green*

Tip: If your scene illumination is correct except for one material that is lighter or darker than you expect, you can use the Mix Color.

Note: it has a greater effect on direct lighting.



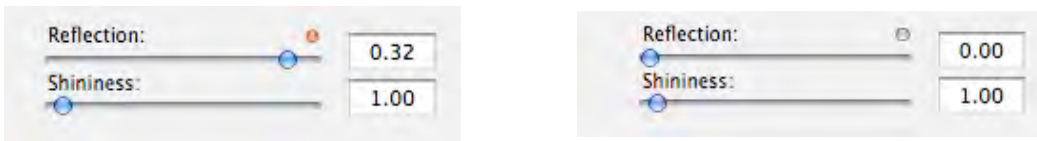
*In this sample, dark gray was mixed with the carpet shader*

### Reflection and Shininess

These work exactly the same way as procedural shaders (see above) but minimum and maximum values can be limited. To change these limits, use “Create Shader” feature.

Note: if Shininess is 0, Reflection does not have any effect on your scene. You have to set a minimum value to Shininess to see Reflection.

Tips: if Reflection > 0 the LED is red; if you click on it, Reflection is reset to 0

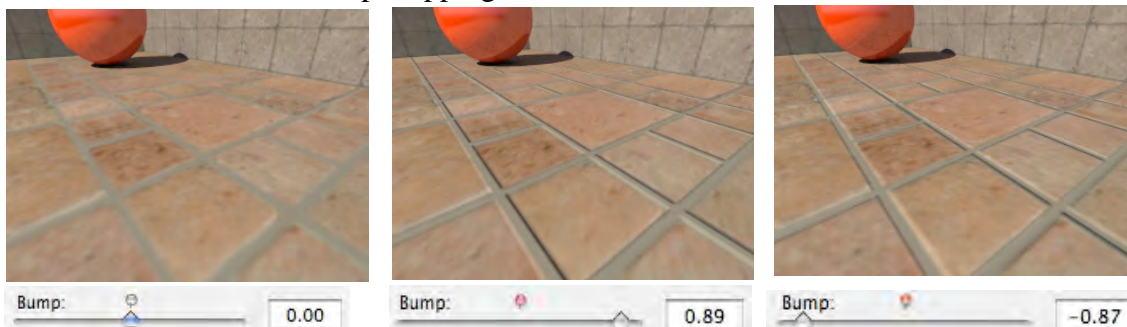


*Here, the maximum value of Reflection is limited to 0.4 (max. possible is 1.0)*

### Bump mapping and/or Normal mapping

These parameters can simulate roughness or relief of the surface. But there is no modification of the geometry.

Relief simulation with Bump mapping:



Tip: if Bump number is 0, the LED becomes red; by clicking on it, the Bump is reset to 0 (neutral position)

(Bump map and Normal map samples are detailed in the “Create Shader” tutorial.)

Note: If the Normal map slider is disabled it means that there is no Normal map in the shader definition.

### Transparency

All shaders are opaque by default. This is the normal use, but it can be useful to have an X-ray vision of some of them in a special view. So it is possible to adjust global transparency for each shader.



*Transparency=0*

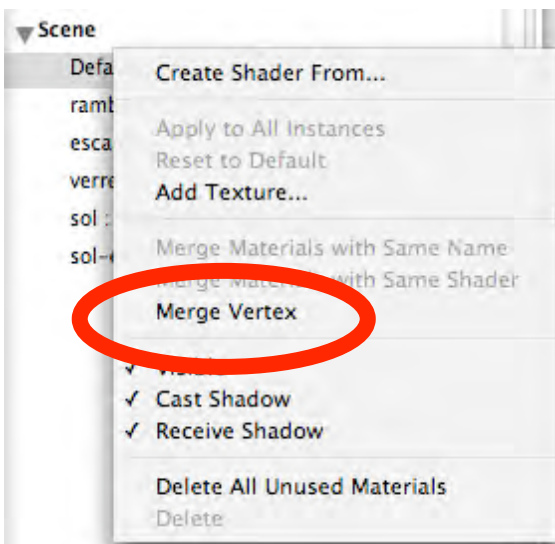
*Transparency=170*

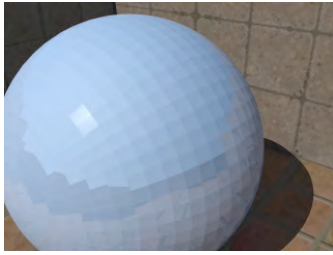
*Transparency=243*

*Transparency=255*

### Material ID parameters: Smoothness

In the “drawer” of the Shader inspector you will find the entire list of materials used in your project. Select a material and right click on it:





Smoothness=0



Smoothness=0.2

### Material ID parameters: Visibility and Shadow casting

In some cases, it is useful to mask a part of the model or to change the shadow processing. In the sample below, the following settings are applied to the sphere:



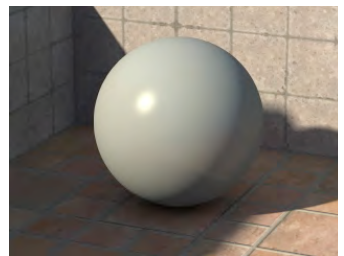
- Material is Visible
- Material Cast Shadows
- Material Receives Shadows



- Material is Visible
- Material Cast Shadows
- Material Receives Shadows

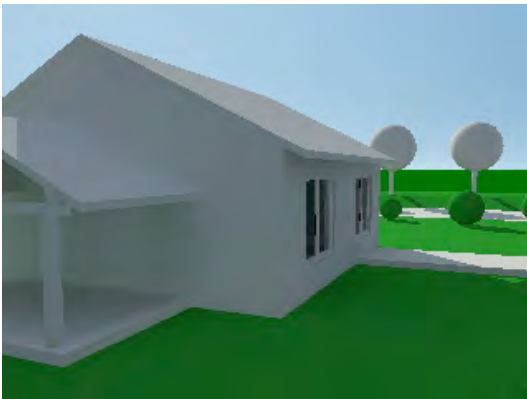


- Material is Visible
- Material Cast Shadows
- Material Receives Shadows



- Material is Visible
- Material Cast Shadows
- Material Receives Shadows

Tip: use “Material Cast Shadows” for the grass to disable the radiosity color bleeding:



- Material is Visible
- Material Cast Shadows
- Material Receives Shadows



- Material is Visible
- Material Cast Shadows
- Material Receives Shadows

- On the left, light is bouncing on the green floor and creates green color bleeding on the wall.
- On the right, light goes through the green floor and there is no green color on the wall

### 3 / Texture mapping

Mapping a texture on a surface does not replace a shader in the material structure; textures are ALWAYS placed over an existing shader.

Texture mapping can be used in various ways:

- 1- to create a specific or repeating ornament
- 2- to modify the shader's aspect
- 3- to cover an entire surface like shaders

Note: In any case you can have several textures mapped on the same shader and they can be used in the same or different ways.

#### 4.1 - Sample 1: create a frieze and a painting on a wall shader

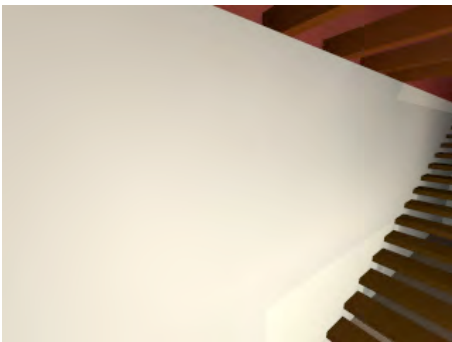


figure 1



figure 2

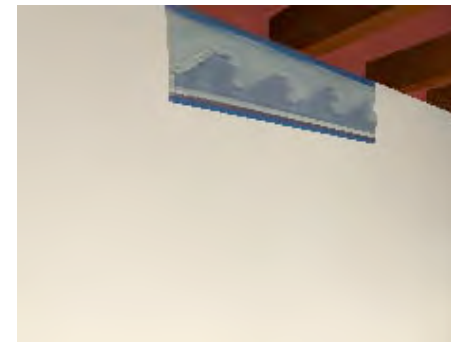
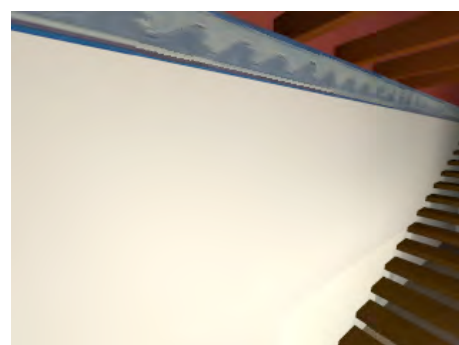
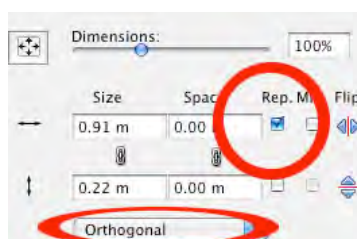


figure 3

Select the wall in the preview (*figure 1*), then put a texture on it by dragging and dropping from the catalog or your hard drive; or by right-clicking on the appropriate shader in the material list and choosing “add texture” from the menu.

Select the Texture (*figure 2*); make some adjustments (size, etc.) in the Texture inspector then move it to the right place (*figure 3*).

Check the Repeat Horizontally box to apply the frieze.



**Note:** *There are three different ways to select a shader or a texture and display it in the appropriate inspector:*

- *click on the shader directly in the preview window*
- *select it from the list of materials*
- *scroll with the arrows until the material is displayed in the inspector*



In Artlantis 2.0, textures are independent; you can select and move them separately. You can link them in the same way you create a hierarchy in the object list.

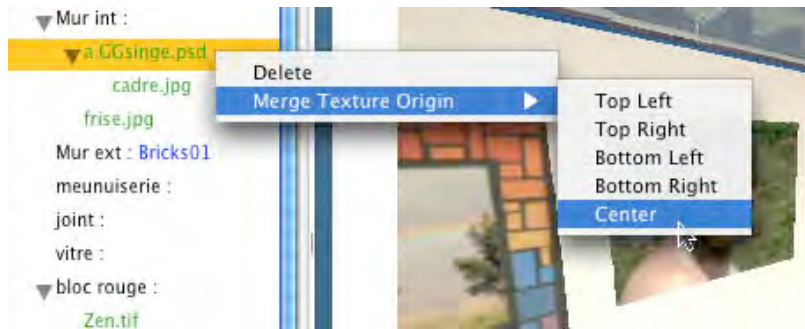
In our sample, after moving “cadre.jpg” over “a GGsinge.psd” in the list, we obtain:



The link means that every manipulation on the main texture will be applied to both (rotation, translation, scaling, etc.).

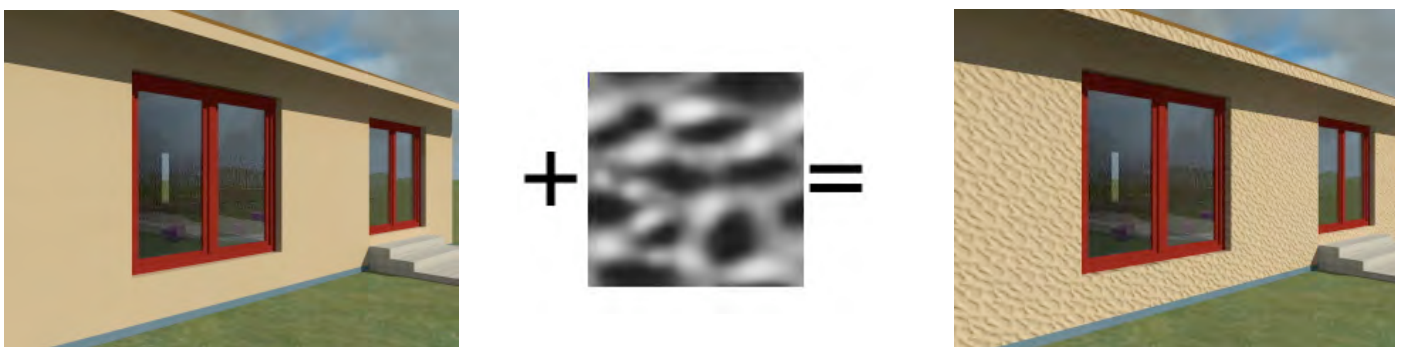
*Note: rendering effects are not concerned.*

It is also possible to merge the origin vertex of all linked textures. The cross in the thumbnail from the inspector defines the origin of the image. To merge the origins, select the appropriate texture in the hierarchy list and choose it from the menu:



#### 4.2 - Texture mapping to modify the surface aspect of an existing shader

Example: Add more relief effect on a Coating shader



*The texture mapping settings are:*

*Bump = 3 - Transparency = 255 - Repeat H = ON - Repeat V = ON*

It is possible to combine with a specific texture to simulate dirt on the bottom of the wall:



*Texture mapping settings are: use Alpha Channel = ON + Repeat H = ON*

*Repeat V = OFF*

Note: This Texture has an alpha channel that creates a progressive transparency from bottom to top.

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#### 4.3 - Texture mapping to simulate a shader

If you do not have the right shader in the library you can use a texture “as a shader.” If you use the same image to map surfaces in several projects, it is highly recommended to transform it into a shader (see Create Shader)

Note: it is recommended having a basic shader under the texture.

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