Particle Texture

This page provides information on the Phoenix Particle Texture (PhoenixFDParticleTexture).

Overview

The **Particle Texture** is a **3D texture**, which reads particles and colors the positions of each particle in a particle system. It can be created from the **Hypershade** in **Maya**.

The Particle Texture can also shade a **Particle's color** based on **Particle Channels**, such as its **Age** or **Speed**. As a result, you can change the Particle's color over time, based on the behavior of those Particle Channels.

Note that the Particle Texture is generated so that each particle is white by default, with the area around each particle having soft edges, that fade to black with further distance from each particle's position. This area can also use color from another texture, or even use different pieces of a texture for each particle.

If a constant color is used, it can either be the same for all particle areas, or it could come from a certain Particle Channel - Age, Velocity, RGB, etc.

You can also plug the Particle Texture into a Phoenix Particle Shader's **color map slot**, which would enable you to shade particles as different colors, based on their Particle Channels.

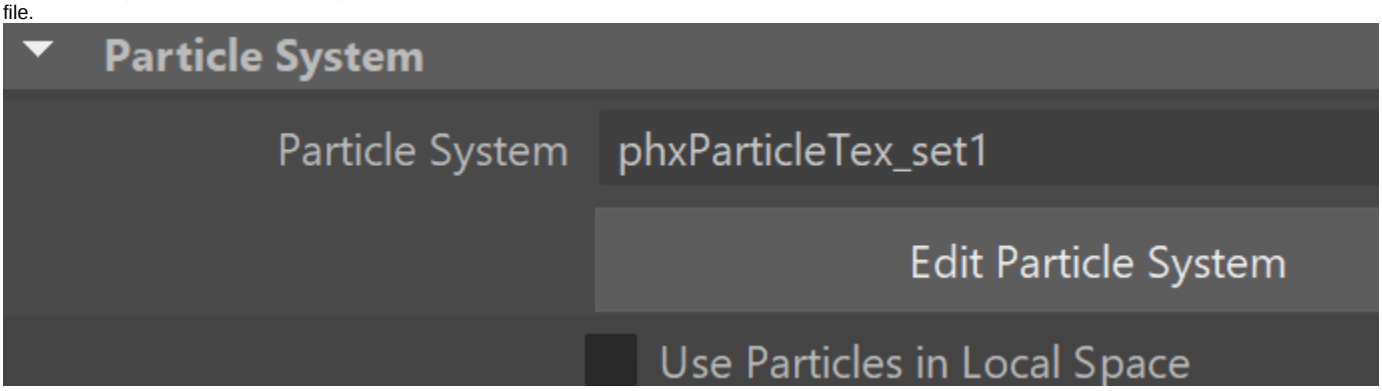
The Particle Texture can also be plugged into a material, and used to shade the surfaces of geometry objects. If you are simulating liquid that creates a **WetMap** particle system over geometries, you can use the Particle Texture as a grayscale mask to blend between two materials, for example, a wet material and a dry surface material. This way, the geometry that is covered by the WetMap particles will appear wet, and the rest of the geometry will appear dry.

You can also turn particles into a **3D mesh**, by using the Particle Texture as a Surface Channel texture in the Rendering rollout. This gives you additional flexibility for shading particles, to achieve more advanced effects. For example, you could use the Particle Texture to mesh specific particles based on their RGB color, which would make it possible to create effects like mixing together a solid and transparent liquid, using two meshes.
UI Path: ||Hypershade|| > **Create panel > Maya section > 3D Textures**
UI Path: ||Create Render Node|| > **Maya section > 3D Textures**

Parameters

Particle System | *particleSystem* – Specifies the particle system that will be used. Note that only the first system in the set will be used. The rest will be ignored.

Use Particles in Local Space | *localSpaceParticles* – When enabled, the icon transformation can be used to move, scale, and rotate the particles. When disabled, the particles are directly represented in the world space as they are in the file.



Particle Areas

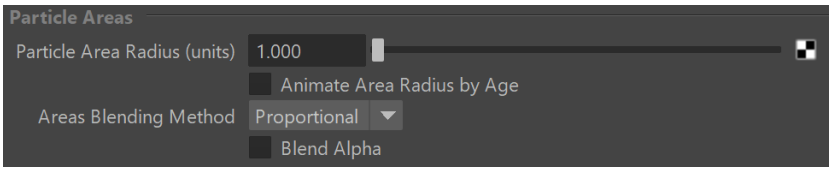
Particle Area Radius (units) | *blendRadiusUnits* – Specifies the size of the particle area. This option is critical to the performance. The larger the **Particle Area Radius**, the longer it would take for the Particle Texture to render. In case you are using the Particle Texture as a **Color Map** in a Phoenix Particle Shader, always start with a very small **Particle Area Radius** - this way the particles would render with black edges. Keep increasing the **Particle Area Radius** until the black edges are no longer visible, and this way you would get the best render speed for your setup.

Animate Area Radius by Age | *animateBlendRadiusByAge* – You could use this option only when you have animated the **Particle Area Radius**. When **Animate Area Radius by Age** is off, the animation of **Particle Area Radius** affects all particles simultaneously. When you enable **Animate Area Radius by Age**, the animation of **Particle Area Radius** will be read using the Age of each particle. This way the animation curve will start from the birth time of each particle, instead of the first timeline frame. This way at one point in time different particles could use different moments of the animation, if they were born at different times. Note: The particle ages must be exported from the Output rollout of the Phoenix Simulator.

Areas Blending Method | *blendingMethod [0 1 2 3]* – Specifies the method for blending particles that have overlapping areas.

> **Equal** | *blendingMethod [0]* – All particles add the same contribution to the end result.
> **Proportional** | *blendingMethod [1]* – The contribution of each particle is determined by the distance to the particle.
> **Biggest** | *blendingMethod [2]* – The particle with the biggest contribution determines the end result.
> **Voronoi** | *blendingMethod [3]* – The nearest particle is used.

Blend Alpha | *blendAlpha* – When enabled, the alpha of the sampled color texture is blended. Otherwise, it is set to 1.



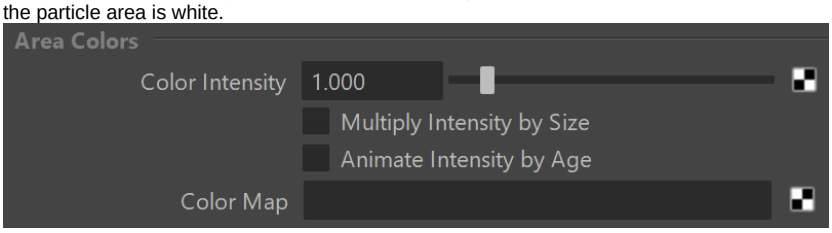
Area Colors

Color Intensity | *amplitudeAmount* – The color strength in the particle area.

Multiply Intensity By Size | *multiplyByParticleSize* – When enabled, the **Color Intensity** value is multiplied by the particle's Size channel. This option can be used when blending wet and dry materials when using WetMap particles (when **Wetting** is enabled in the Dynamics rollout) because the WetMap particles shrink with time.

Animate Intensity By Age | *animateAmplitudeByAge* – You could use this option only when you have animated the **Color Intensity**. When **Animate Intensity By Age** is off, the animation of **Color Intensity** affects all particles simultaneously. When you enable **Animate Intensity By Age**, the animation of **Color Intensity** will be read using the Age of each particle. This way the animation curve will start from the birth time of each particle, instead of the first timeline frame. This way at one point in time different particles could use different moments of the animation, if they were born at different times. Note: The particle ages must be exported from the Output rollout of the Phoenix Simulator.

Color Map | *texture* – Specifies a texture map connected to the particles. The contribution of each particle is the color from the texture in the **Particle Area Radius**, fading to black with soft edges or blending with overlapping particle areas using the **Areas Blending Method**. If no texture is specified, the particle area is white.

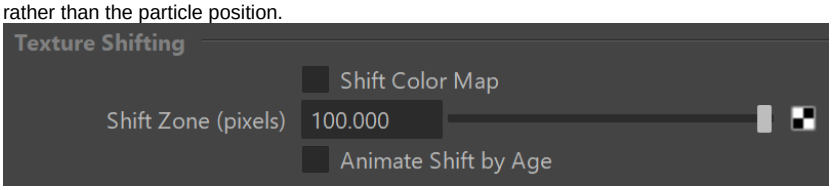


Texture Shifting

Shift Color Map | *shiftMode* – Enabling this option changes the calculation algorithm. Instead of contributing to the resulting colors, the particles instead give shifted coordinates for the texture specified in the **Shift Zone** field. When the simulation starts, each particle relates to a pixel on the texture, and also to a number of pixels around it using the radius specified by the **Shift Zone** parameter. As the particles move, they "pull along" the related part of the texture. If the **Animate Shift By Age** option is enabled, particle age is used to shift the texture rather than particle position. This mode has no effect if no texture is specified in the **Shift Zone** field.

Shift Zone (pixels) | *shiftAmount* – Specifies the radius used in **Shift Color Map**.

Animate Shift By Age | *animateShiftByAge* – When enabled, the particle age will be used to shift the texture rather than the particle position.



Color From Particle Channel

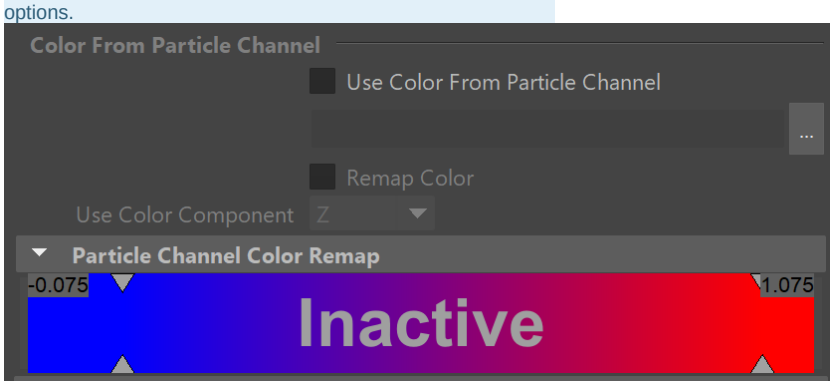
Use Color From Particle Channel | *colorFromPartChan* – When enabled, the particle areas are colored using a specified particle channel of the connected particle system, such as Age, Size, Velocity, Position, etc. Note that if the particle channel is a vector channel, such as RGB, Position and Velocity, it can directly be shown as color in each particle area, but if the channel is a scalar such as the Size, Age or ID of the particles, it will produce grayscale color, unless you use the **Remap Color** option.

Remap Color | *partColorRemap* – This option remaps a different color for scalar particle channels such as the Size, Age or ID of the particles, or a component from vector particle channels such as RGB, Position, or Velocity. For example, you can remap the particle Age which ranges from 0 (black) for newborn particles to several tens or hundreds (seconds), to a gradient from blue color for newborn particles to red color for old ones - you can do this by placing the blue color at position zero in the color gradient, and placing the red color at a value that is the maximum particle Age (in seconds). You need to know the value ranges of the particle channels in order to remap them correctly - check the Particle Channel Ranges page for more information. When remapping vector channels, you have to set the **Use Color C omponent** option to one of the vector components of the channel.

Use Color Component | *remapColorComponent* – Specifies the vector component of channels such as RGB, Position, or Velocity to be used when remapping.

X – Uses the X axis of positions or velocities, or the Red channel from RGB color.
Y – Uses the Y axis of positions or velocities, or the Green channel from RGB color.
Z – Uses the Z axis of positions or velocities, or the Blue channel from RGB color.
Length – Uses the length of the particle channel. Can be used with the Velocity channel when you need to remap the Speed of the particles to colors. If X, Y or Z are used with Velocity, this will remap the Speed respectively in the X, Y or Z directions.

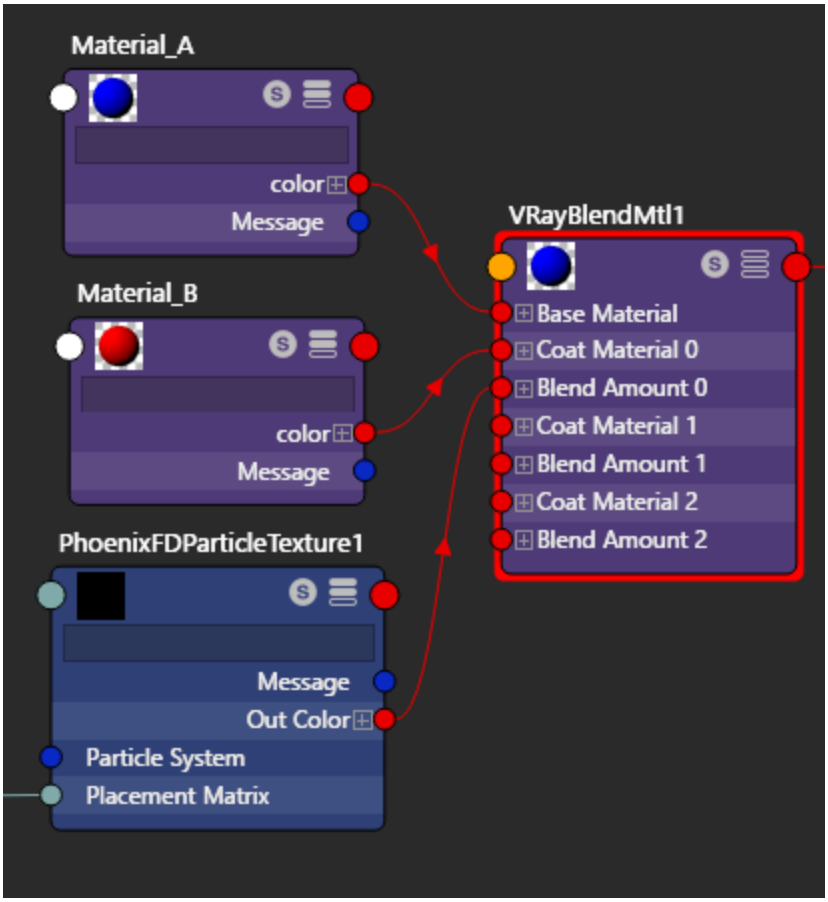
The **Remap Color** gradient stores its attributes with the *partc olor_p*, *partcolor_c* and *partcolor_i* script names.
You can render out the **Color From Particle Channel** as a separate render element by using the Phoenix Particle Texture as an input for the Extra Texture render element and turning on **Render as Geometry** in the Particle Shader's options.



Setup for shading dry and wet materials

The PhoenixFDParticleTexture can be used to blend between two materials. In the example below, two different V-Ray Materials are set as the **Base Material** and **Coat Material** of a V-Ray Blend Material. The PhoenixFDParticleTexture node's Out Color is set as the **Blend Amount** map.

This setup can be used when rendering the **Wetmap** particles of the Phoenix simulation. You can use a PhoenixFDParticleTexture to read the **Wetmap** par ticle system and then blend between two materials - a dry and a wet one.


Material_A
color
Message
Material_B
color
Message
PhoenixFDParticleTexture1
Message
Out Color
Particle System
Placement Matrix
VRayBlendMtl1
Base Material
Coat Material 0
Blend Amount 0
Coat Material 1
Blend Amount 1
Coat Material 2
Blend Amount 2