

Fire

This page provides general information about the Fire sub-section of the Rendering tab of the V-Ray Volumetric Grid.

Overview

This window controls the emissive (fire) color of the volumetric shader and the light emitted by the V-Ray Volume Grid. There are controls for the color and intensity of the emission and to gradually transition between a physically correct and artistic look of the fire. Unlike the smoke color which needs an external light to become visible, fire will be visible immediately.

Parameters

Based on | *emSource* – Specifies the source channel that will be rendered as fire. By default, the **Temperature** channel is used.

- **Disabled** – the emission component of the shader is disabled.
- **Temperature**
- **Smoke**
- **Speed**
- **Fuel**
- **Texture** – the emission is based on the texture map specified in the Texture parameter
- **RGB**

Texture | *emTexture* – If **Based on** is set to **Texture**, this slot specifies the texture from which fire is rendered. This slot can also specify a texture to be used with the **Modulate** option.

Modulate | *emModulate* – Enabling this option multiplies the **Based on** channel by the map in the **Texture** slot. This is only effective when **Based on** is not set to **Texture**.

Reset to Defaults – Resets the rollout settings to their default values.

Fire Opacity Mode | *emIgnoreAlpha* – While smoke has its own opacity in the Smoke Opacity tab, the Fire opacity can be determined in either one of the following three ways:

Use Smoke Opacity – Fire uses the same opacity that is set to the smoke in the Smoke opacity tab. This means the fire is not visible in cells where there is no smoke.

Fully Visible – Fire will always render as if it has full opacity, but will not produce alpha. This way fire will be visible even in cells that have no opacity. This mode is intended for use with Phoenix simulations, such as simulations with sources that emit Temperature but do not emit Smoke. During rendering, Phoenix internally composes the fire with the scene using additive blending, and such blending must be used when compositing fire manually. However, this mode is not suitable for compositing fire mixed with smoke.

Use Own Opacity – Custom varying opacity for the fire using the **Opacity** diagram and/or using a texture.

Physically Based | *emBlackBody* – Transitions between an artistic look of the fire (when set to 0) and a realistic physically-based Intensity (when set to 1). The realistic mode multiplies the fire intensity by the [Black Body Radiation](#) model, which gives strong brightness to the hot parts of the fire. See the [Physically Based example](#) below.

Opacity Texture Mode | *emAlphaSrc* – Available only when the **Fire Opacity Mode** is set to **Use Own Opacity**.

Don't Use Opacity Texture – The Fire Opacity is based entirely on the **Color and Opacity Curve** below.

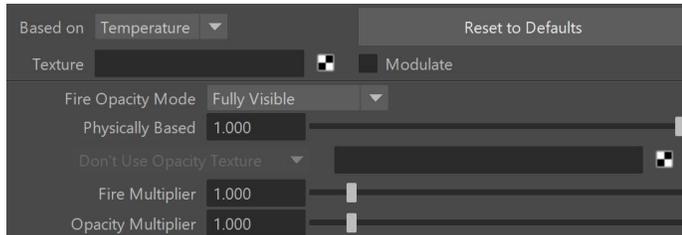
Multiply Opacity By Texture – The **Color and Opacity Curve** is multiplied by the specified **texture** to produce the final Fire Opacity.

Fire Opacity From Texture – The Fire Opacity is based entirely on the specified texture - the Color and Opacity Curve are ignored.

Opacity Texture | *emAlphaTexture* – If **Opacity Texture Mode** is set to **Multiply Opacity By Texture** or **Fire Opacity From Texture**, this slot specifies the texture used to modulate the Fire Opacity.

Fire Multiplier | *emMult* – General multiplier for the fire color's intensity.

Opacity Multiplier | *emAlphaMult* – Multiplier for the fire's own opacity when it is detached from the Smoke Opacity. Visible only when the **Opacity Mode** is set to **Use Own Opacity**.



Color and Intensity Ramp

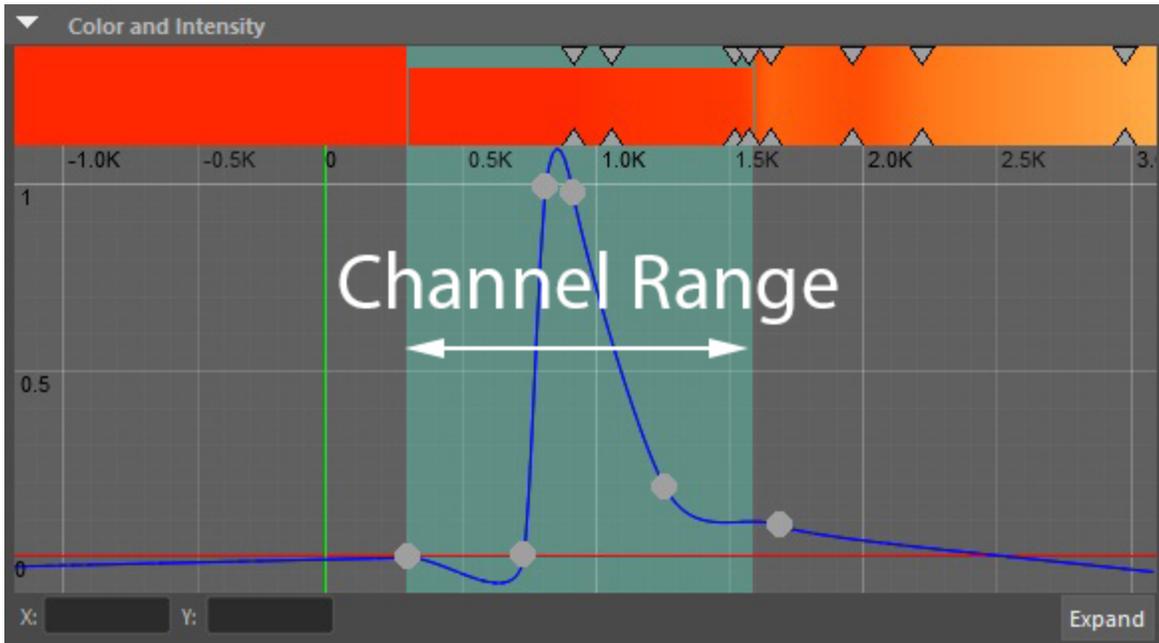
When the **Based on** option is set to a grid channel, this grid simulation data must be remapped to render data. The sim data channel is laid out horizontally along the X axis in the color gradient and intensity/opacity curve. The color gradient remaps the sim data from the **Based on** channel to fire color. The curve remaps the sim data to fire opacity (in **Use Own Opacity mode**), or to fire intensity otherwise. The opacity/intensity is mapped vertically on the Y axis.

Simulation data has different ranges, depending on the solver it came from - Phoenix Smoke usually goes from 0-1; Fuel goes from 0-1; Temperature is in Kelvins, so it goes from 300-2000, or a few thousand; Speed is in Voxels/sec, so it depends on the grid size and resolution, but usually goes from 0 to several hundred. Data from other solvers often differs a lot from Phoenix ranges. The channel data range is shown in the gradient and curve with a light-blue range which can change as you scroll the timeline as the temperature in a cache file rises, smoke dissipates, speed changes, etc., so keep in mind that the data range for one frame might not be representative for the entire cache sequence. You can also check the data ranges for the currently loaded cache file under the Input roll-out of the V-Ray Volume Grid.

Color | *emRampColor_t, emRampColor_s, emRampColor_v, emRampColor_f* – Controls the color of the light as a function of the selected channel's value. This color is multiplied by the Fire Multiplier to achieve the final value that is used. The selected channel's data range is highlighted in light blue.

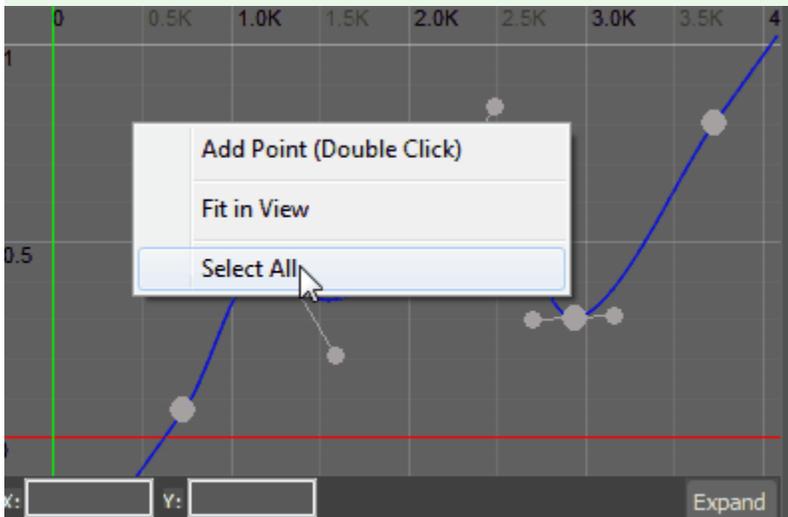
Intensity | *epower_t, epower_s, epower_v, epower_f* – Visible when the **Fire Opacity Mode** is set to **Use Smoke Opacity** or **Fully Visible**. The luminance of the emitted light is determined by the function represented in the diagram control. Along the X axis is the value of the selected **Based on** source channel (Temperature, Fuel, etc.). The color of the light is set by the gradient control above. The selected channel's data range is highlighted in light blue.

Opacity | *epower_t, epower_s, epower_v, epower_f* – Visible only when the **Fire Opacity Mode** is set to **Use Own Opacity**. The opacity of the emitted light is determined by the function represented in the diagram control. Along the X axis is the value of the selected **Based on** source channel (Temperature, Fuel, etc.).



You can use the following controls in the color gradients and diagrams:

- Double click** – Creates a new point or changes an existing one.
- Left button drag over a point** – Moves the point. If several points were selected beforehand, they move the same amount.
- Left button drag over several points** – Selects several points.
- Middle button drag over the background** – Drags the visible area. If the Shift key is pressed, scales the diagram in the corresponding direction.
- Mouse wheel** – Zooms in/out.
- Right-click** – Displays a drop-down menu where you can add a point, edit or delete a selected point, and fit the entire diagram or gradient into the view. If multiple points are selected, they can be edited simultaneously. Multiple selected points can also be scaled and flipped with the **Scale Selection** option as seen below.



Example: Physically Based

This example illustrates transitioning from a darker artistic look (0) to a photorealistic look (1) using the **Physically Based** parameter to alter the apparent brightness of the fire



Physically Based = 0



Physically Based = 0.1



Physically Based = 1