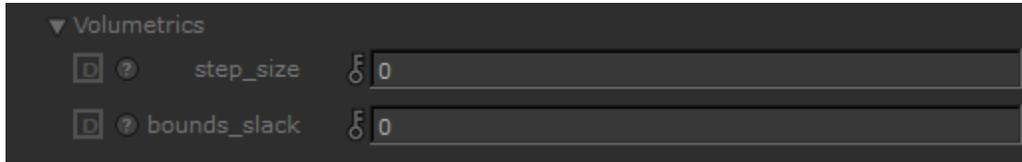# Volumetrics

step_size

Sets the size for sampling inside the volume. It should be small enough to capture the smallest feature in the volume (aka the Nyquist limit). If the size is too large, aliasing, bias, or banding will appear. Smaller (and therefore more accurate) sizes will increase render times while larger sizes will render more quickly.

Step_size basically controls the rate at which the volume shader gets called. The value indicates the average distance between adjacent volume shader samples along a given ray, in world space units. Generally, you will want this setting to be as large as possible before visibly noticeable artifacts occur, and in the case of voxelized volumes no smaller than about half the size of your voxels (in world space). A low *step_size* will increase render times. For example, when the *step_size* is 0.1 and the volume is 10 units big in world space, there are approximately 100 primary samples and therefore the volume shader is called 100 times.

> ⓘ   The *step_size* has a fixed size, therefore, the larger the container the more steps will be taken and the longer it will take to render. Also, beware that if the *step_size* is too small your render times will increase. If you cannot see the rendered volume, you may need to reduce the *step_size* value.
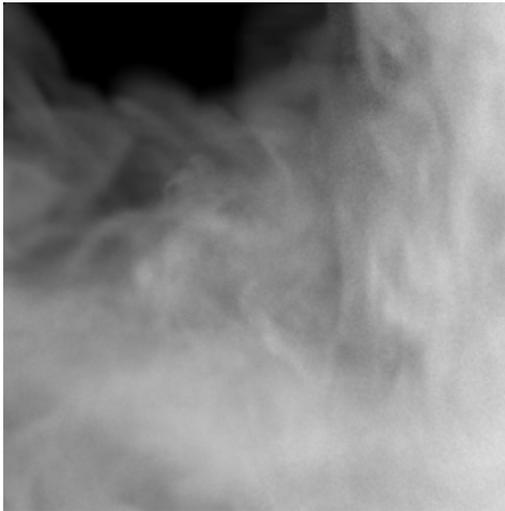
| 0.1 | 2 | 5 |
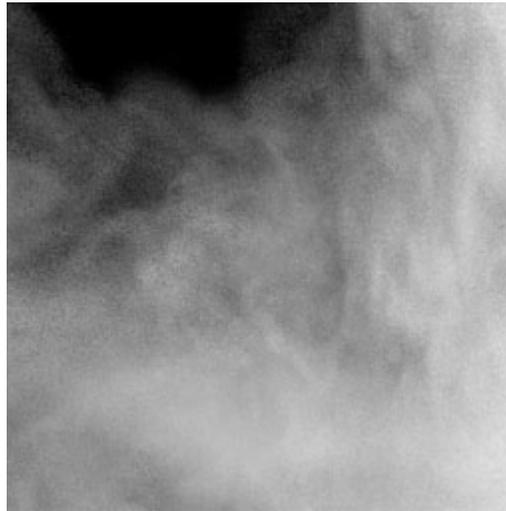
> ⓘ   More information about volume Step Size can be found here.

volume_padding

Enlarge the volume by *Padding*. This is useful when displacing a volume with a noise for example. Note that this slack applies not only to the bounding box but also to the voxels used for ray extents inside the bounding box. When velocity motion blur is enabled, some extra padding is computed, based on the maximum value of the velocity field, and the maximum of the velocity padding and user padding is applied. When padding exceeds the bounding box maximum dimension, the ray extents acceleration makes little sense and is disabled, so you should set the padding as tightly as possible.

> ✓   For best performance, this should be set as low as possible, while still covering the maximum displacement amount.

0   10

The amount of padding to add to the volume bounds for displacement