

# FireSmoke Interaction

This page provides information on the Interaction rollout for a Fire/Smoke Simulator.

## Overview

It is strongly recommended that each geometry interacting with the fluid simulation:

- has no open edges or holes;
- does not self-intersect;
- has normals pointing outwards.

Phoenix will try to handle any geometry that does not comply with these conditions, but the simulation might not behave properly. For example, in the case of fire/smoke simulations, some areas of the simulation may lose velocity and freeze for no apparent reason, whereas in liquid simulations, particle explosions can appear.

This dialog is used to enable/disable the interaction with objects in the scene. There are several different types of objects that may affect the simulation: Sources, Solid objects, Forces, etc.

By default, all these scene elements will interact with the simulator unless otherwise specified by the **Include/Exclude list**. If you want to disable the interaction, you have to put the objects in the **Exclude list**. If there are more objects that don't need to interact with the simulator, you may alternatively switch to the **Include list** mode. In this mode, you will need to add to the list all the objects that you want to interact with the simulator.

Since all forces affect the simulation by default, adding a force in your scene to be used by PFlow, for example, will also automatically affect your simulation and this might not be desirable. In the Active Forces list, you can check which 3ds Max forces interact with the simulator, and you may exclude forces if you wish to.

UI Path: ||Select Fire Smoke Simulator object|| > **Modify panel** > **Interaction rollout**

## Parameters

**Expand** – Opens a floating dialog that contains the selected rollout and automatically folds the command panel rollout.

**Re-Center** – Resets the position of the floating rollout.

? – Opens up the help documents for the Fire/Smoke Interaction.

**Include/Exclude List** | *ielist\_new iemode\_new* – Determines which objects will be ignored or processed by the simulation. Use the radio buttons to switch between **Include list** and **Exclude list**. When **Exclude list** is active (the default), all objects in the scene will interact with the simulator unless they are added to the exclusion list. In **Include list** mode, no objects will interact with the simulator unless they are added to the list. Note that in **Include list** mode, in order for a Source to work in a simulation, you must add the Source and also all of the geometries or particles it emits from.

**Exclude Hidden Objects** | *exclhidden\_new* – When enabled, the hidden objects will be excluded no matter if they are in the list or not.

**Add** – Adds the selected object to the Scene Interaction list.

**Add Many** – Adds many objects to the Scene Interaction list allowing to quickly add a list of nodes.

**Remove** – Removes the selected object from the Scene Interaction list.

**Geom Border Voxels** | *objvox* – The Fire/Smoke simulator is a grid-based simulator, and geometry is converted into voxel form in order to interact with the fluids. The voxels overlapped by Solid geometry obstacles are frozen and processed in a different way. When a given voxel is half-way inside the geometry, this option helps you choose whether this voxel is going to be frozen or not. Even if this does not produce significant changes in the simulation, in rendering you might see a gap between the fire/smoke and obstacles in **Circumscribed** mode. On the other hand, very thin obstacles might be missed by the simulation if you use **Inscribed** mode, so it would be better to use **Circumscribed** for such geometries. You can also override the voxel mode per object from its [right-click Phoenix FD properties](#). For more information, see the [Object Voxels example](#) below.

**Circumscribed** – All voxels that intersect the surface are considered solid.

**Center** – The surface voxels are considered solid only if their bigger part lies in the object.

**Inscribed** – All voxels that have intersection with the surface are considered non-solid.

The **Geom Border Voxels** setting is a simulation option. If its value changes, the simulation must be calculated again for the changes to take effect.

▼ Scene Interaction

Expand

Re-Center

?

☐ Include List

☐ Exclude List

☒ Exclude Hidden Objects

Add

Add Many

Remove

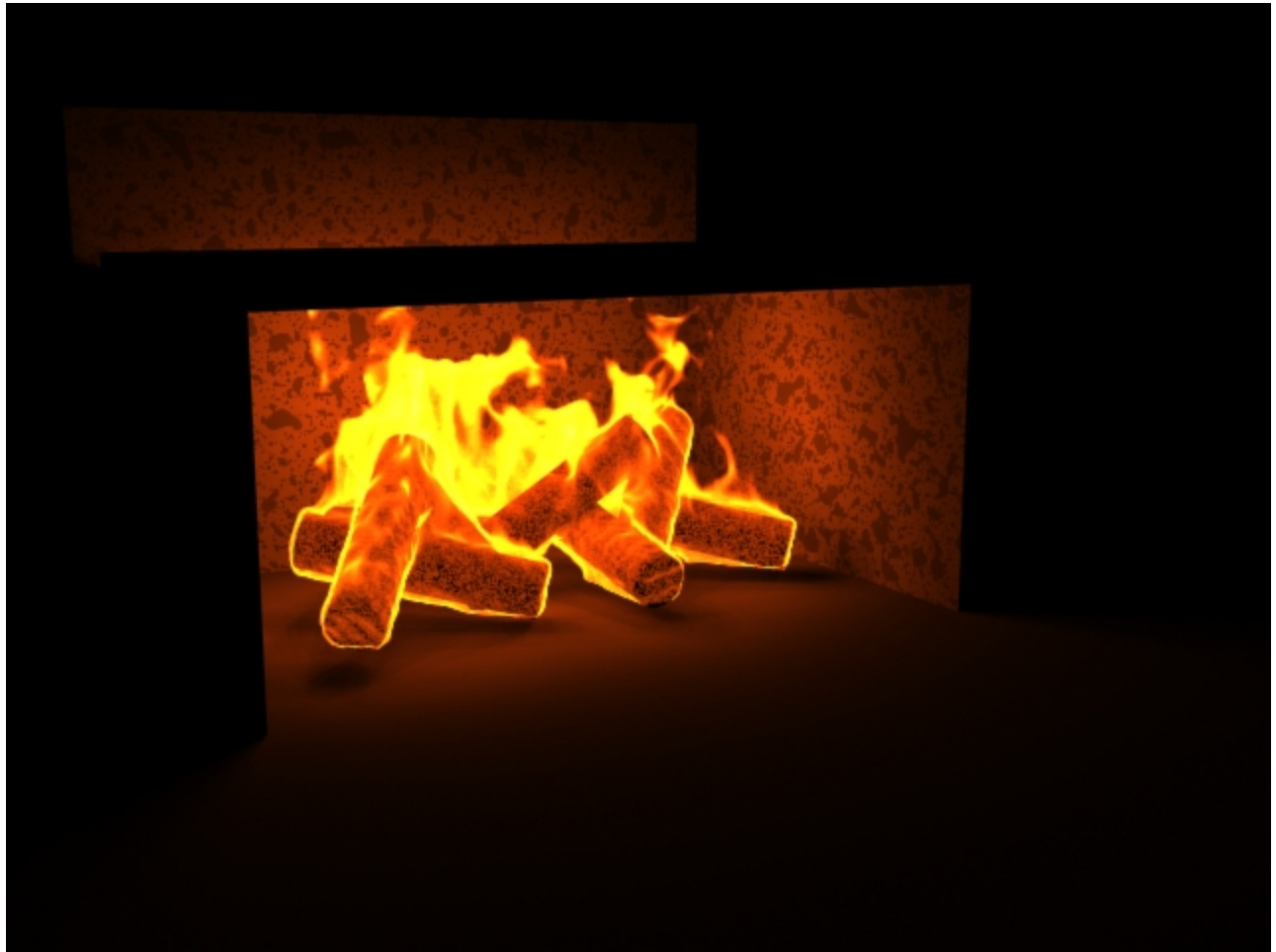
Geom Border Voxels:

Circumscribed ▼

### Example: Geom Border Voxels

The example below shows the difference in emission when the object uses Inscribed (voxels intersecting the surface are non-solid therefore do *not* emit) vs Circumscribed (voxels intersecting the surface are solid) voxelization.





Inscribed  
Circumscribed