



Fluid Dynamics v2.0

For Adobe® After Effects® 7.0/CS3

User Guide

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• WHAT'S NEW IN VERSION 2.0

[Layer Force \(Force Vectors Field\)](#)

[Layer Emitter](#)

[Two methods of computation](#)

[Fluid velocity vectors preview](#)

[Calculation Steps](#)

Start Frame simulation parameter removed

• REQUIREMENTS

Fluid Dynamics version 2.0 runs under Windows XP/Vista or MacOS X operating system, as a plug-in for Adobe After Effects 7.0/CS3 software.

• INSTALLATION

Windows

Unpack zip file and start setup program. Follow its instructions.

You must accept license agreement to install this software on your computer.

If you have serial number, choose *Install registered version* and type it in *Serial number* field or you can try demo mode but along with an effect a water mark will be rendered.

During installation you will be asked to enter the path to install to.

For Adobe After Effects 7.0/CS3, the default location for plug-ins is:

C:\Program Files\Adobe\Adobe After Effects 7.0\Support Files\Plug-ins

C:\Program Files\Adobe\Adobe After Effects CS3\Support Files\Plug-ins

Mac

Unpack zip file and copy all plug-ins to After Effects plug-ins folder. For Adobe After Effects 7.0 the default location for plug-ins is:

/Applications/Adobe After Effects 7.0/ Plug-ins/

/Applications/Adobe After Effects CS3/ Plug-ins/

When you have completed installation restart After Effects.

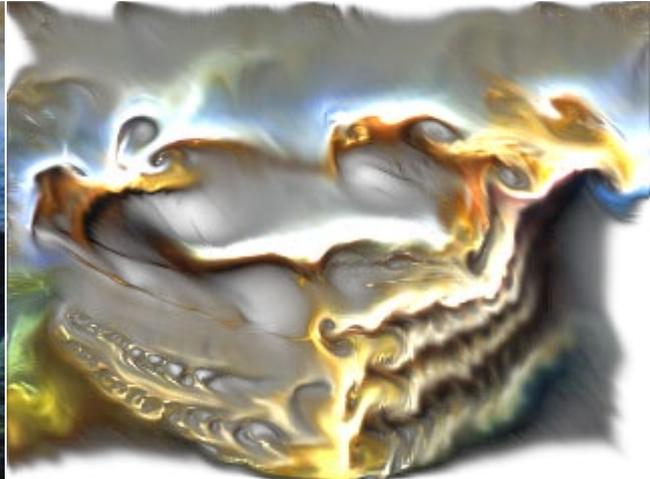
All effects will appear in [*Effects > Electrocolor - Fluid Dynamics >*] submenu.

• QUICK START

Apply **Fluid** effect to a picture layer and hit "*RAM preview*" (0 on numeric keypad).



Original Layer



Fluid Effect

• SUPPORT FOR FLUID DYNAMICS

If you have problems using **Fluid Dynamics**, please check this user guide to verify the correct way to use it. If you do not find the answer to your problem here, you may email: support@electrocolor.com

• INTRODUCTION

This plug-in simulates fluid dynamics. You'll be able to create smoke, paint, transitions and other wonderful effects easily. It's possible to manipulate such fluid parameters as viscosity, diffusion, density and so long. Parameters can be animated. Also you can add as much fields and fluid emitters as you want. 16 bit per color supported.

Notice!

Consider this effect is dynamic. So each successive frame is computed basing on the previous one. That means only sequential rendering is possible. You can't render the frame alone in the middle of the sequence. If you want to see the effect at certain frame you have to render all sequence till that frame. For the same reason it doesn't support animation in layer. See **Fluid (Source parameter)** for more detail.

The effect is resolution dependent. When you select "Half" in the composition window computations will be faster but the final look will be slightly different.

Do not retime the layer the effect is applied to.

If you want to restart computation just turn the effect off and on again. That will remove rendered frames from cache.

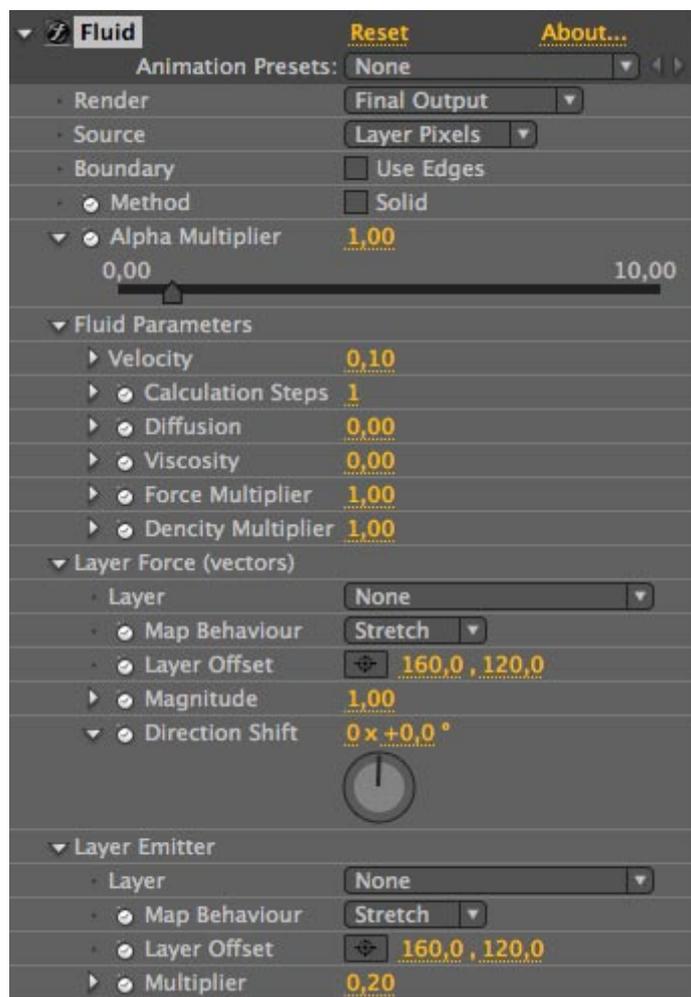


• FLUID

The main effect which does all work is **Fluid**.

(*Effects > Electrocolor – Fluid Dynamics > Fluid*)

But without fields it does nothing. So to see some movement you have to add at least **Fluid** and **Field** effects.



Parameters:

Render – Has three choices: **Final Output**, **Velocity Vectors** and **Combine**.

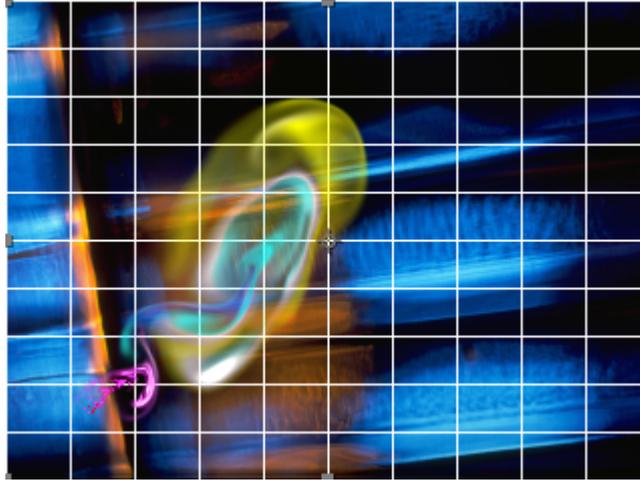
Final Output – Renders final fluid

Velocity Vectors - Renders just velocity vectors of fluid

Combine – Renders velocity vectors over final fluid

Source – Has two choices: **None** and **Layer Pixels**.

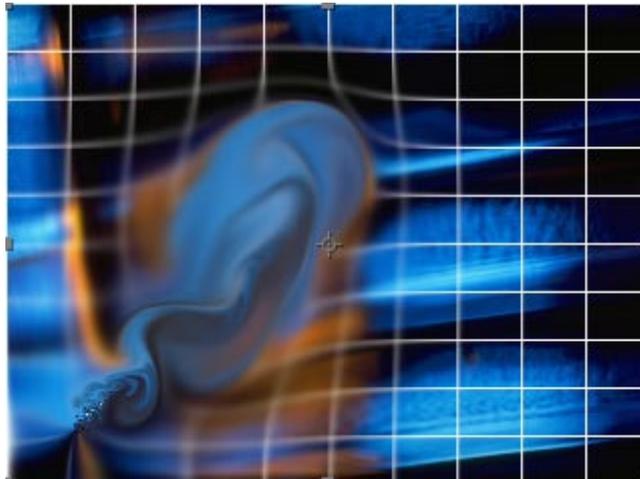
None means no source pixels will be used. Before computations layer is totally transparent and contains no density. You have to add at least one emitter to see fluid in that case. This choice is suitable for smoke and fluid effects.



Transparent fluid over another layer.

Layer Pixels means layer already contains density represented its source pixels. This choice is suitable for interesting fluid distortions.

If there is an animation in a layer (i.e. the layer is not a still picture) the first frame will be used as a source for density.



Layer distorted by fluid.

Boundary – if checked layer edges will be used as fluid collision object.

Method – if checked solid (old) method is used. If not - alpha become transparent more quickly.

Alpha Multiplier – considered if **Method** is not **Solid** (unchecked). The more the value, the denser the fluid.

Fluid Parameters

Velocity – time step for fluid computations. The smaller the value, the slower the fluid.

Calculation Steps – specifies the number of sub-steps for each frame of fluid dynamics simulation. A value of greater than 1 causes plug-in to oversample fluid dynamics simulations by the specified value.

Increasing calculation steps slows down performance but increases the quality of fluid dynamics.

Diffusion – controls how fast the fluid will dissolve by the lapse of time.

Viscosity – viscosity of the fluid. Bigger values give gluey movement.

Force Multiplier – all forces' magnitude will be multiplied by this value.

Density Multiplier – all emitters' density will be multiplied by this value.

Layer Force (vectors)

Layer - specifies layer to be used as source for motion vectors.

Layer of motion vectors:

Each pixel of a layer represents a force vector $\langle F_x, F_y \rangle$ that will affect the fluid.

F_x – Horizontal component of a vector corresponds to the Red component of a pixel color.

F_y – Vertical component of a vector corresponds to the Green component of a pixel color.

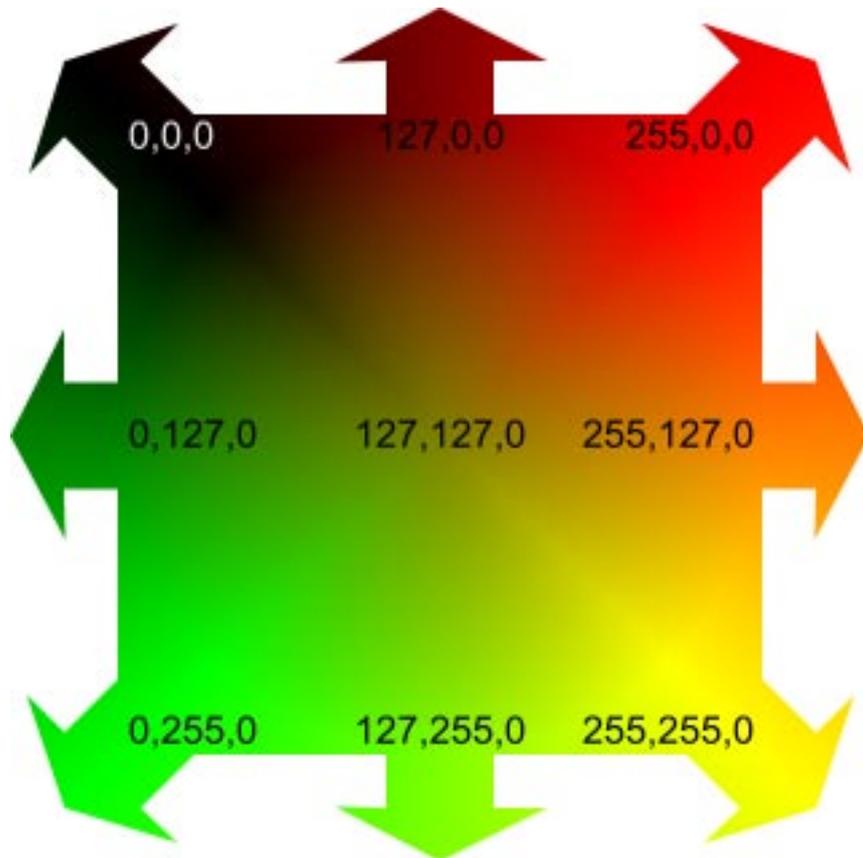
Blue component of a pixel color is ignored.

A color of $\langle 127, 127, \text{any value} \rangle^*$ represents the zero $\langle 0, 0 \rangle$ vector (means no force will be applied in that particular point to the fluid). (See picture below)

A color of $\langle 0, 0, \text{any value} \rangle^*$ represents the $\langle -1, -1 \rangle$ vector (directing the force to the upper left corner). (See picture below)

A color of $\langle 255, 255, \text{any value} \rangle^*$ represents the $\langle 1, 1 \rangle$ vector (directing the force to the lower right corner). (See picture below)

* 127, 255 is for 8 bit project. For 16 bit the values would be 16383 and 32768 (32768 is the maximum (white) value in After Effects for 16 bit projects).



Correspondence between colors and vectors

Map Behavior – Could be one of the following:

Stretch. Map Layer will stretch up to size of the layer an effect applied to.

Tile. Map Layer will tile all over the layer preserving its size.

Center. Map Layer will be placed at the center of the layer preserving size.

Layer Offset – Controls the offset of motion vectors.

Direction Shift – Controls the angle offset of motion vectors.

Layer Emitter

Layer - specifies layer to be used as source for density emitting.

Map Behavior – Could be one of the following:

Stretch. Map Layer will stretch up to size of the layer an effect applied to.

Tile. Map Layer will tile all over the layer preserving its size.

Center. Map Layer will be placed at the center of the layer preserving size.

Layer Offset – Controls the offset of layer emitter.

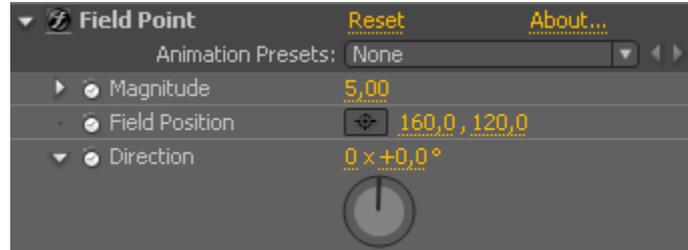
Multiplier – amount of density that will be emitted in a fluid.

• FIELDS

There is only one type of field yet – **Point Field**.

(*Effects > Electrocolor – Fluid Dynamics > Field Point*)

But you can add as much of them as you like.



Parameters:

Magnitude – controls how much the force will affect the fluid.

Field Position – position of the field in a layer. If it exceeds a layer boundary it will not affect the fluid.

Direction – force will move the fluid in this direction.

• EMITTERS

There is only **Point Emitter**.

(*Effects > Electrocolor – Fluid Dynamics > Emitter Point*)

But as well as fields you can use as much of them as you like.



Parameters:

Density – amount of density that will be emitted in a fluid.

Emitter Position – position of the emitter in a layer. If it exceeds a layer boundary it will not affect the fluid.

Color – color of the emitted fluid.

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