

# Advanced Fluid/cum Simulation with FLIP-Fluids add-on. (1.7.3)

*This guide is inspired by the one @bell\_nsfw made for the community.*

FLIP-fluids change a lot since the original @bell\_nsfw .pdf, now the viscosity acts differently and with the newer versions we sadly have few issues with some default settings like floating Particles.

I will do my best to share my knowledge with everyone, since fluid simulation is 90% trial and error, I would like to help others and hopefully save some time and pains

I don't claim this to be the best way to do this, I will share what I find works the best for me.

[FLIP Fluids documentation](#)

**If I made a mistake or there is a better alternative, make sure to contact me.**

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## FLIP Fluids

FLIP Fluids add-on is perfect for simulating small scale liquid simulation, the technique used is also used in many other fluid simulation tools.

Fluid simulation can be intimidating, complex and the truth is - IT IS, unlike what the official WIKI would say, since you will always run into issues with FLIP Fluids, and unless you know how to fix them you will constantly go through trial and error or just give up.

Despite all this, FLIP Fluids are one of the better choices when it comes to simulating cum/lube and other naughty fluids.

## Fluid Domain Settings

### **MUST READ**

- When creating your domain, make sure that your domain covers everything that is visible and is a part of your simulation.  
**Obstacles:** It's mostly ok for the domain to cover them PARTIALLY, from my knowledge this is not a problem.
- **Inflows:** It's **NOT OK** for your inflow object to go out of the boundaries of the domain (even partially), since this can mess up the simulation and fluid velocity calculations.

The domain object should be created from a cuboid shaped object.

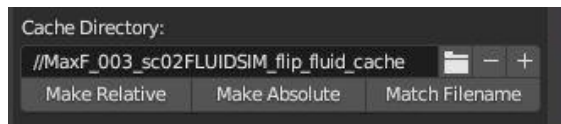
- The domain object should be created from a cuboid shaped object.
- The domain object must be aligned to the Blender X/Y/Z axis' and cannot be rotated.
- The location and scale of the domain object cannot be keyframed or animated.
- The domain object should not contain any modifiers.
- There can only be one domain object in a single Blend file.
- Scale should always be 1, so always apply to scale. (Not sure about this one, I always do it.)

### **Domain optimization:**

This is important and can possibly save you A LOT of time, make the Domain as small as possible, this will help in saving memory and baking time.

### **Don't be afraid of making multiple setups for one animation:**

Sometimes it's better to make multiple fluid simulations for one animation than one long fluid bake, this way you will always keep the domain as small as possible instead of making a huge domain with high resolution.



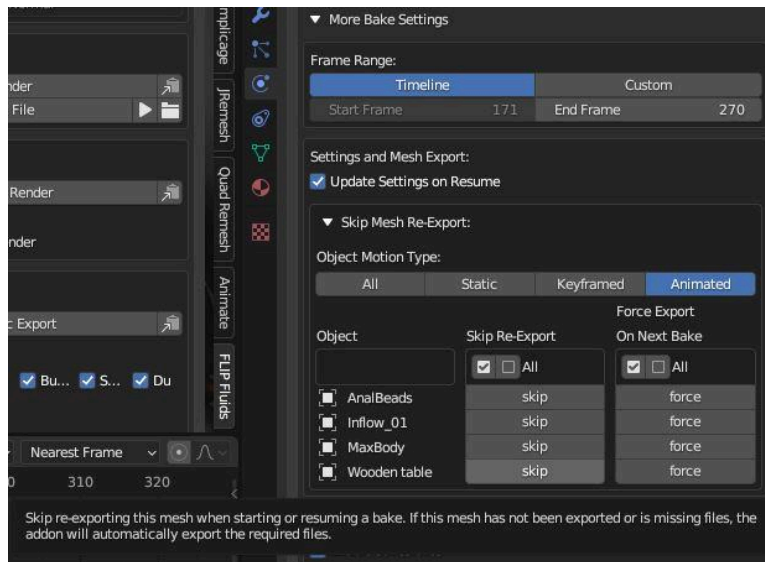
I find it better to do this by saving multiple .blend files and just adjusting the domain / simulation settings for what is the best for you, then just click "Match filename" so the new bake cache won't override the old one.

## FLIP Fluid Simulation

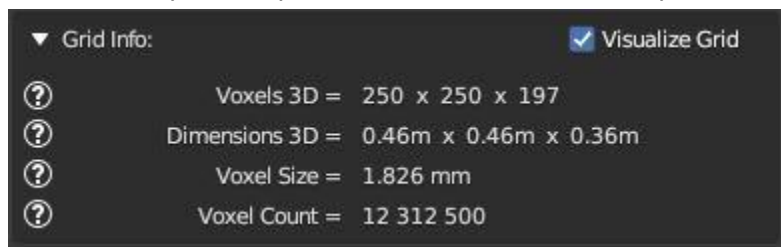
In fluid simulation > More bake settings, make sure to keep an eye for "Skip Mesh Re-Export", always skip meshes that are the same **when resuming the bake.**

When using FLIP, you can pause simulation and change animation mid-bake for example, and resume the bake.

However, in this case you will have to export animated obstacle, skipping this saves you a lot of time especially with longer fluid simulations.



Another super useful thing is grid info, especially when you are doing multiple simulations in one animation, helps to keep on the same voxel size as the previous simulations.



Voxel size depends on the resolution AND the domain size, so it's always recommended to always concentrate more on the voxel size instead of the simulation resolution like most people do.

Tick the "Visualize grid", will help you understand this better in 3D viewport.

## Grid Resolution:

Grid resolution should **DEPEND ON YOUR DOMAIN SIZE**, the larger your domain the higher resolution you need your bake to be for smaller voxels.

I usually aim for 1.5mm - 2mm voxel size, I find it the best and most optimal for quality.

Tho my memory usage sometimes peaks over 40-45gb, so if you are short on ram, just aim for larger voxel size.

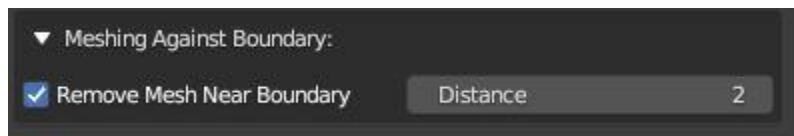
Another thing you won't find in FLIP-fluid documentation is that voxel size also affects the viscosity solver, and overall simulation in some way.  
(needs more info)

## Simulation Method: APIC

APIC is always better for smaller scale and viscous simulations, it's more stable than FLIP



## Meshing Against Boundary:

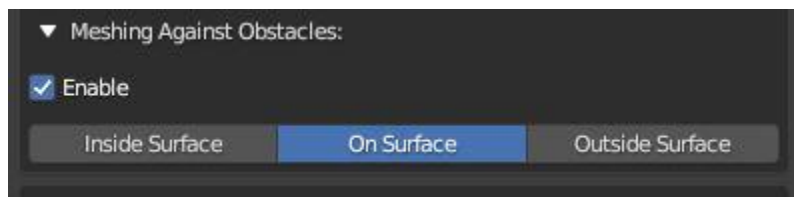


This removes the fluid near the boundary of the mesh, without this flying fluid that might hit the edge of the domain will collide with invisible boundaries, this should always be on.

Also helps to remove mesh that is near boundaries, **HOWEVER** for the bottom of the domain I sometimes use **wider Outflow** objects to REMOVE the mesh before the particles start stacking on top of each other (if this is not visible in the camera).

**Outflow** removes particles and therefore contributes to your fluid simulation efficiency tremendously sometimes.

## Meshing Against Boundary:



People generally use "Inside Surface" but I use "On surface" for my simulations, i find it working better than inside Surface and don't see any artifacts mentioned in official documentation, might have been a little different if it was more transparent material.

Here is how these are described in the wiki:

### On Surface

Generate fluid-solid interface directly on the obstacle surface. This may lead to rendering artifacts if using a transparent material due to overlapping triangles between the fluid and obstacle object.

### Inside Surface

Generate fluid-solid interface on the inside of the obstacle. The fluid surface will penetrate the obstacle.

### Outside Surface

Generate fluid-solid interface on the outside of the obstacle. This will leave a gap between the fluid surface and obstacle.

### Viscosity / Surface Tension / Sheeting:

In “Flip fluid world” go ahead and enable Viscosity, Surface Tension and Sheeting.

### Viscosity properties:

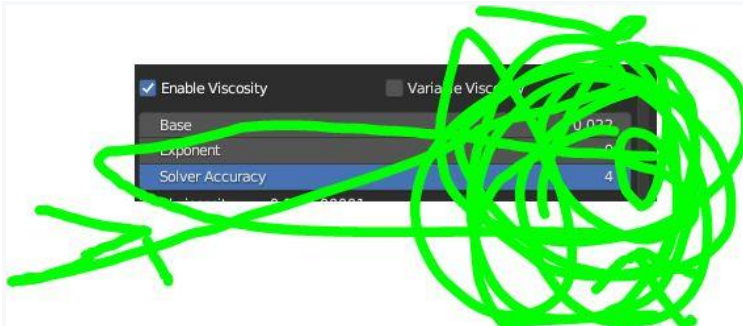
Base: 0.0215 (polished jade bells setting still valid in 2024 )

## Solver Accuracy: 4

**THIS IS IMPORTANT, THE DEFAULT IS 2, CHANGE IT TO 4.**

I had to stay awake multiple nights to fix an issue I was having, when aiming for a high resolution bake and having viscosity enabled, you might come see some smaller particles starting to float midair despite not being attached to anything, yet somehow the bigger blobs affect the speed of those “Floating particles”, it’s this setting.

**ALWAYS have Solver Accuracy set to 4.**



This is a problem with the newer versions of FLIP-Fluids, I can see this exact same problem with some other creators.

### Surface Tension:

Base: 0.0015

Keep the recommended “Estimated substeps” in mind, this will be your maximum substep property or else your particles might explode.

### Sheeting Effect:

Sheeting Strength: 0.01

Sheeting Thickness: 0.01

Obstacle sheeting: 0.125+ (This one is mostly up to you to decide per scene/object)

## Flip Fluid Materials:

Some materials for your fluids, I mostly adjust to my liking, but this is something not that related to the fluid simulation IMO, so here is something that you can start with.

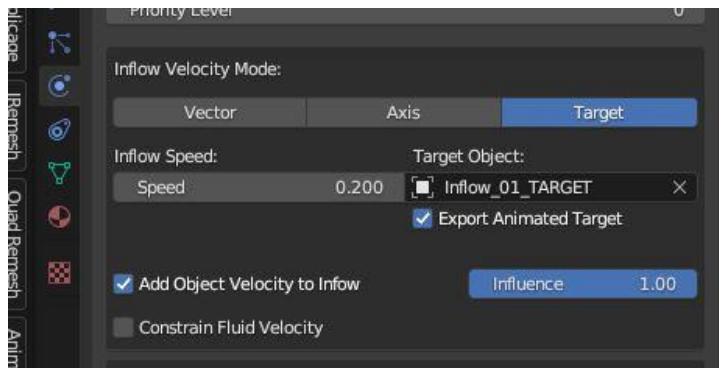
[SmutBase • Ultimate Cum Library v2](#)

[SmutBase • Ultimate Cum Pack By YudaJuda](#)

## Inflows:

### Requirements:

- Object geometry is required to be [Manifold/Closed/Watertight](#) in order to work correctly and predictably within the FLIP Fluids simulator. The objects are required to have volume and planar surfaces cannot be used.
- The object should be sufficiently large/thick in order to be resolved on the simulation grid. The smallest/thinnest geometry features of the object should cover at least one voxel on the simulation grid ([What is the simulation grid?](#)).
- If the object is animated, the mesh geometry must not change topology between frames if the *Add Object Velocity to Inflow* option is enabled. This means that each frame of the animation must have the same number of vertices and triangles and that the vertices are always connected to the same neighboring vertices.
- If the object animation is more complex than keyframed location/rotation/scale, enabling the [Export Animation Mesh](#) option will be required.
- It's mostly a good idea to use a Target instead of vectors, with cleverly using parenting.  
**Keep in mind to also Export Animated Target**



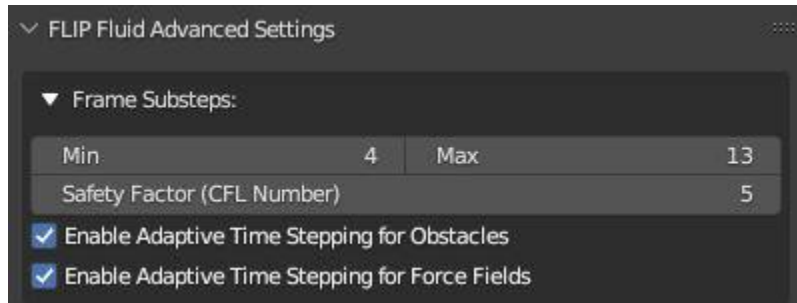
There is no right or wrong way of doing this, since i usually mix things up with how i use inflow in my animations, I don't have one way of doing this.

- Inflow speed 0 -> 1.7/2 -> 0 for cum shots, for everything else I use other speeds, so it really depends on what you are trying to simulate/make.
- **“Add object velocity to inflow”** should be on when thrusting or simulating fluid with moving dildo squirt gun, for example.

When enabled, the object velocity will also be considered in speed calculations

- Skip re-export: This should be on unless you paused the bake, changed the inflow animation and resumed it.

## FLIP Fluids advanced settings:



Minimum Substep should always be at least 4, and maximum at least the recommended “Estimated substep” value from “Surface Tension” tab.

Enable Adaptive Time stepping for Obstacles, it’s a must-have for obstacles with fast motion (Slayed.com level of aggressive fuck kind of obstacles for example)

## FLIP Fluids advanced settings:

The developers recommend to keep “Remove particles with extreme velocities” enabled but we shouldn’t have any of these with recommended frame substeps.

What will this do is instead remove any fast moving particles even if they are meant to be fast, and stuff will look weird, will update this if they do something about this in later builds, for now keep it off.

## Obstacles:

### Friction:

For cum I mostly use 0.80–1, it’s mostly sticky.

For squirting, I end up with a lower 0.4–0.6 value.

It’s always a good idea to play around with these settings and test bake before making a final bake.

**Sheeting strength multiplier:** Should match the setting in the domain settings.

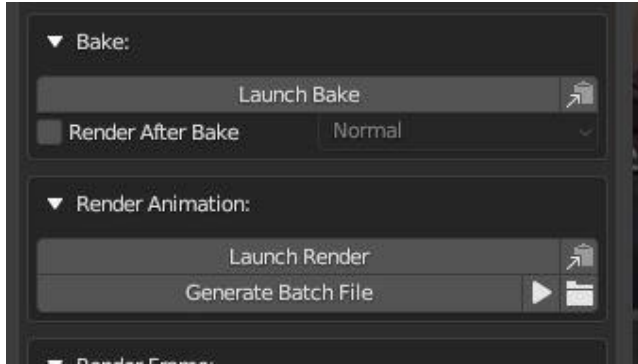
**Export Animated Mesh:** On (Unless you paused the bake, changed the animation of the obstacle and resumed)

### Fluid surface modifier:

By default, fluid surface will have “Smooth” modifier, but the default repeat is 0, make sure to crank it up to 20.

## FAQ:

**Running out of memory, what can I do to reduce memory usage ?**



- It's ALWAYS a good idea to save your .blend file and bake with the command line using the "Launch Bake" button, make sure to quit Blender to get back those precious GBs of memory blender is inhaling from your system.
- Reduce the Domain size and bake resolution, 32gb memory is a must for the voxel size mentioned above, tho for better quality bakes it's always recommended 64gb of memory. It's always a good idea to have a lot of reserved memory when doing a large scale bake, since the memory consumption might grow mid-way through the bake.
- Check your windows task manager and close everything that consumes a lot of memory, yes chrome included with 13 tabs of Twitter Porn.

### **Inflow not spawning any fluids, why ?**

- Apply to scale, always apply to scale.
- "The object should be sufficiently large/thick in order to be resolved on the simulation grid. The smallest/thinnest geometry features of the object should cover at least one voxel on the simulation grid"
- Make sure to export animated mesh if the inflow is animated.

### **Fluid going through obstacles, why ?**

- Obstacle is not manifold
- Fluid voxels are thicker than the obstacle thickness
- Make sure that you ticked the "Export animated mesh" tick box.

### **Viewport performance is terrible after bake, what can I do ?**

- Change "Fluid particle display" in "Quick Viewport Display" tab to "Preview" or "None", and click on the "Reload Frame" button.



Thanks for reading through, I will keep supporting and updating this article, will post the updates in my website:

[MadihsonNSFW.com](https://MadihsonNSFW.com) or and in my [Discord server](#).

I have put spend of time and effort into figuring all this out, feel free to support me in [Patreon](#) if you wish to do so.