

9.8.8 Physics - Soft Body - Soft Body Settings

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Soft Body settings

Soft Body

This creates the soft body modifier on the selected object

Render

Enable soft body during render

Display

Display soft body in real time.

Soft Body

Friction

The friction of the surrounding medium. Generally friction dampens a movement.

Mass

Mass value for vertices. Larger mass slows down acceleration, except for gravity where the motion is constant regardless of mass. Larger mass means larger inertia, so also braking a Soft Body is more difficult.

Vertex Group Mass

Use a specified vertex group for mass values

Speed

You can control the internal timing of the Softbody system with this value.

Soft Body Cache

Note

Start- and Endframe

The *Start* and *End* settings in the *Collision* panel are not only valid for the baking, but for all Soft Body simulations. So if your animation lasts longer than 250 frames, you have to increase the *End* value.

Cache

Select cache to use for simulation. Add, and remove caches.

Cache Name

Specify the name of the cache.

Start / End

First and last frame of the simulation. Always valid, not only for *baking*.

Cache Step

Number of frames between cache steps.

Disk Cache

Save cache files to disk. Blend file must be saved first.

Use Lib Path

Use this files path when library linked into another file.

Compression

Compression method to be used

No

No compression.

Light

Fast but not so effective compression.

Heavy

Effective but slow compression.

Bake

Calculates the simulation and protects the cache. You need to be in *Object* mode to bake.

Free Bake

Clears the cache.

Calculate to Frame

Bake physics to current frame

Current Cache to Bake

Bake from Cache.

Bake All Dynamics

Bake all physics

Free All Bakes

Free all baked caches of all objects in the current scene

Update All To Frame

Update cache to current frame

If you haven't saved the blend file the cache is created in memory, so save your file first or the cache may be lost.

Soft Body Goal

Use Goal

Soft Body Goal acts like a pin on a chosen set of vertices; controlling how much of an effect soft body has on them. Enabling this tells Blender to use the position / animated position of a vertex in the simulation. Animating the vertices can be done in all the usual ways before the Soft Body simulation is applied. The *goal* is the desired end-position for vertices. How a softbody tries to achieve this goal can be defined using stiffness forces and damping.

Default

A *Goal* value of 1.0 means no Soft Body simulation, the vertex stays at its original (animated) position. When setting *Goal* to 0.0, the object is only influenced by physical laws. By setting goal values between 0.0 and 1.0, you can blend between having the object affected only by the animation system, and having the object affected only by the soft body effect.

Minimum / Maximum

When you paint the values in vertex-groups (using *Weight Paint* mode), you can use the *G Min* and *G Max* to fine-tune (clamp) the weight values. The lowest vertex-weight (blue) will become *G Min*, the highest value (red) becomes *G Max* (please note that the blue-red color scale may be altered by User Preferences).

Stiffness

The spring stiffness for *Goal*. A low value creates very weak springs (more flexible “attachment” to the goal), a high value creates a strong spring (a stiffer “attachment” to the goal).

Damping

The friction for *Goal*. Higher values dampen the effect of the goal on the soft body.

Vertex Group

Use a vertex group to allow per-vertex goal weights (multiplied by the *Default* goal).

Soft Body Edges

Use Edges

The edges in a Mesh Object can act as springs as well, like threads in fabric.

Pull

The spring stiffness for edges (how much the edges are stretched). A low value means very weak springs (a very elastic material), a high value is a strong spring (a stiffer material) that resists being pulled apart. 0.5 is latex, 0.9 is like a sweater, 0.999 is a highly-starched napkin or leather.

Push

How much the Softbody resist being scrunched together, like a compression spring. Low values for fabric, high values for inflated objects and stiff material.

Damp

The friction for edge springs. High values (max of 50) dampen the edge stiffness effect and calm down the cloth.

Plastic

Plasticity, permanent deformation of the object.

Bending

This option creates virtual connections between a vertex and the one after the next. This includes diagonal edges. Damping applies also to these connections.

Length

The edges can shrink or been blown up. This value is given in percent, 0 disables this function. 100% means no change, the body keeps 100% of his size.

Stiff Quads

For quad faces, the diagonal edges are used as springs. This stops quad faces to collapse completely on collisions (what they would do otherwise).

Shear

Stiffness of the virtual springs for quad faces.

Aerodynamics

Simple

If you turn on *Aero* the force is not confined to the vertices, but has an effect also on the edges. The angle and the relative speed between medium and edge is used to calculate the force on the edge. This force results that vertices with little connecting edges (front of a plane) fall faster than vertices with more connecting edges (middle of a plane). If all vertices have the same amount of edges in a direction they fall with equal speed. An edge moving in its own direction feels no force, and an edge moving perpendicular to its own direction feels maximum force (think of a straw moving through air). Try it with an *Factor* of 30 at first.

Lift Force

Use an aerodynamic model that is closer to physical laws and looks more interesting. Disable for a more muted simulation.

Factor

How much aerodynamic effect to use

Edge

Checks for edges of the softbody mesh colliding.

Face

Checks for any portion of the face of the softbody mesh colliding (compute intensive!). While *CFace*

enabled is great, and solves lots of collision errors, there doesn't seem to be any dampening settings for it, so parts of the softbody object near a collision mesh tend to "jitter" as they bounce off and fall back, even when there's no motion of any meshes. Edge collision has dampening, so that can be controlled, but Deflection dampening value on a collision object doesn't seem to affect the face collision.

Soft Body Self Collision

Self Collision is working only if you have activated *Use Edges*.

Self Collision

When enabled, allows you to control how Blender will prevent the Soft Body from intersecting with itself. Every vertex is surrounded with an elastic virtual ball. Vertices may not penetrate the balls of other vertices. If you want a good result you may have to adjust the size of these balls. Normally it works pretty well with the default options.

Manual

The *Ball Size* directly sets the ball size (in BU).

Average ("average")

The average length of all edges attached to the vertex is calculated and then multiplied with the *Ball Size* setting. Works well with evenly distributed vertices.

Minimal / Maximal

The ball size is as large as the smallest/largest spring length of the vertex multiplied with the *Ball Size*.

AvMiMax

$\text{Size} = ((\text{Min} + \text{Max})/2) \times \text{Ball Size}$.

Size

Default 0.49 BU or fraction of the length of attached edges. The edge length is computed based on the algorithm you choose. You know how when someone stands too close to you, and feel uncomfortable? We call that our "personal space", and this setting is the factor that is multiplied by the spring length. It is a spherical distance (radius) within which, if another vertex of the same mesh enters, the vertex starts to deflect in order to avoid a self-collision. Set this value to the fractional distance between vertices that you want them to have their own "space". Too high of a value will include too many vertices all the time and slow down the calculation. Too low of a level will let other vertices get too close and thus possibly intersect because there won't be enough time to slow them down.

Stiffness

Default 1.0. How elastic that ball of personal space is.

Dampening

Default 0.5. How the vertex reacts. A low value just slows down the vertex as it gets too close. A high value repulses it.

Collisions with other objects are set in the (other) *Collision panel*. To collide with another object they have to share at least one common layer.

Soft Body Solver

These settings determine the accurateness of the simulation.

Min Step

Minimum simulation steps per frame. Increase this value, if the Soft Body misses fast moving collision objects.

Max Step

Maximum simulation steps per frame. Normally the number of simulation steps is set dynamically (with the *Error Limit*) but you have probably a good reason to change it.

Auto-Step

helps the Solver figure out how much work it needs to do based on how fast things are moving.

Error Limit

Rules the overall quality of the solution delivered. Default 0.1. The most critical setting that says how precise the solver should check for collisions. Start with a value that is 1/2 the average edge length. If there are visible errors, jitter, or over-exaggerated responses, decrease the value. The solver keeps track of how “bad” it is doing and the *Error Limit* causes the solver to do some “adaptive step sizing”.

Fuzzy

Fuzziness while on collision, high values make collision handling faster but less stable.

Choke

Calms down (reduces the exit velocity of) a vertex or edge once it penetrates a collision mesh.

Print Performance to Console

Prints on the console how the solver is doing.

Estimate Matrix

Estimate matrix... split to COM, ROT, SCALE