

Explanation of Properties

Click the checkboxes labeled “Pro Time Controls,” “Pro Physics Controls,” and “Pro Spawn Patterns” to enable all properties. Since particles have so many properties, it’s useful to use the search bar at the top of the properties window.

Image Index

The image index changes what image is used to draw particles. Click on the thumbnail to select an image.

Draw Mode

Changes the way particles are drawn. There are four modes:

- **Add** is the simplest mode. Particles are emissive, and the brightness of the system increases as the number of particles increases.
- **Blend add** is similar to Add, except in that when particles overlap, the total brightness does not increase.
- **Alpha** particles are darker and can be opaque or transparent.
- **Solid** mode makes particles completely opaque. They cast and receive shadows and reflect light sources. Because of this, solid particles have a few extra parameters:
 - Shininess changes the brightness of light reflected.
 - Hardness changes how diffuse the reflection is.
 - Specular colour changes the saturation of the reflection (when set to 0, reflected light is white).

Colour

Particles fade between start, middle, and end colours throughout their lifetime. The alpha channel for colour does different things in different draw modes:

- In Add mode, the alpha channel is a multiplier for brightness.
- In Blend Add mode, lowering the alpha channel causes particles to behave more like additive particles.
- In Alpha mode, the alpha channel affects transparency.
- In Solid mode, the alpha channels for colour start, middle and end affect shininess, hardness, and specular colour respectively.

Brightness

The base brightness of each particle. In any draw mode, particles can be effectively made emissive by increasing the brightness.

Fade Sharpness

Fade sharpness controls how quickly a particle fades in and out at the beginning and end of its lifetime. A greater value corresponds to a shorter fade time.

Scale

Affects the size of particles.

Particle Count

The number of particles in the system.

Lifetime

The lifetime of a particle in seconds.

Respawn Time (Pro Time Controls)

The time in seconds between when a particle disappears and respawns.

Lifetime Variance (Pro Time Controls)

Affects the range of possible lifetimes. A variance of 0 means that the lifetime of each particle will be exactly the input value for lifetime. A variance of 1 means that the lifetime of each particle will be a random value ranging from 0 to the value for lifetime.

Respawn Time Variance (Pro Time Controls)

Similarly to Lifetime Variance, this affects the range of possible respawn times.

Spawn Time Variance (Pro Time Controls)

Affects the range of possible spawn times.

Reverse Time

Causes time to move backwards for the system.

Spawn Bounds Type

Changes the shape of the spawn area.

<https://giant.gfycat.com/MasculineClassicBrahmanbull.gif> (lost)

- **Box** spawns particles in a rectangular prism.
- **Cylinder** spawns particles in either a cylinder or a cylindrical shell shape with adjustable inner and outer radii and height.
- **Sphere** spawns particles in either a sphere or a spherical shell shape with adjustable inner and outer radii. The height variable stretches the spawn bounds. Set it equal to the outer radius for a uniform sphere.
- **CameraXYZ** distributes particles in a volume centered on the camera whose size is determined by Fade Far. Because of this, increasing the size of the spawn bounds will not reduce the density of particles, but increasing Fade Far will. This is useful for effects with many dense particles in a large volume, such as rain or snow.

- **CameraXY** is similar to CameraXYZ, but spawn positions are restricted to within the Z bounds. This is useful for effects with many dense particles in a large surface area, such as the RainSplats preset.
- **Track Attached Box** causes the spawn bounds to conform to the curve of a spline object the particle object is attached to. To attach objects to a spline, press shift+A.
- **Track Attached Cylinder** is similar to Track Attached Box, but a small perpendicular slice of the bounds looks like a cylinder or cylindrical shell. In this case, Bounds Height is actually the length of the bounds along the spline.

Spawn Bounds

Adjust the size of the spawn bounds.

Gravity

The magnitude of a constant acceleration in a fixed direction in meters per second squared (one unit of distance in the editor is equal to one meter).

Gravity Latitude and Longitude (Pro Physics Controls)

The direction of gravity in degrees.

Local Gravity (Pro Physics Controls)

Enabling Local Gravity causes gravity to align with the local coordinates of the system (if the object rotates, gravity will rotate with it).

Particle Velocity

The initial speed of a particle in meters per second.

Velocity Variance (Pro Physics Controls)

This affects the range of possible initial speeds.

Acceleration (Pro Physics Controls)

The magnitude of a constant acceleration in the same direction as a particle's initial motion in meters per second squared.

Look at Camera

Particles always face the camera.

Is Directional

Directional particles are stretched longitudinally along their trajectory. The amount of stretching depends on speed. Directional particles cannot rotate.

Directional Length (Enabled for systems with directional particles)

Adjust the amount directional particles are stretched.

<http://web.archive.org/web/20191116071605/https://thumbs.gfycat.com/CompassionateHighHoneybadger-mobile.mp4>

Subdivision Count (Enabled for systems with directional particles)

Directional particles can be subdivided to more closely approximate the curve of their trajectory. Subdividing particles decreases the maximum allowed particle count.

<http://web.archive.org/web/20191120202032/https://thumbs.gfycat.com/MerryWhisperedDodo-mobile.mp4>

Twirl (Disabled for systems with directional particles)

The angular speed at which a particle rotates in radians per second.

Cone Emitter

Allows more control over the direction particles are spawned in.

Cone Angles

The 'angle' of a particle here refers to the direction of its initial motion. The range of angles particles are spawned at depends on these values. Angles are in degrees.

Cone Latitude and Longitude

The direction of the cone emitter in degrees.

<https://giant.gfycat.com/NimbleDaringAdouri.gif> (lost)

Is Static

Causes particles to freeze in time.

Time Offset

Displaces time for the system.

One Shot

Particles start moving only when a trigger is hit. Depending on time values, particles either haven't spawned or are visibly frozen in place before the trigger is hit. Particles do not respawn.

Trigger Distance (Enabled for one-shot systems)

The radius at which one-shot systems are triggered.

Seed

The seed with which random values are determined. A negative seed will be randomized while positive seeds are fixed values.

Fade Near

The distance at which particles begin to fade into transparency.

Fade Far

The maximum draw distance for particles.

Quantization

In this context, quantization means that a variable is restricted to a given number of discrete, evenly spread values. This allows spawn positions to be restricted to a grid of points, lines or planes. Velocities, spawn times and angles can also be quantized.

<http://web.archive.org/web/20230824092801/https://thumbs.gfycat.com/SlipperyDelightfulDore-mobile.mp4>

Repeaters

The repeater settings can be used to correlate otherwise independent variables.

Increment the spawn time for particles and/or the position of particles on a given axis. Think of each particle as having an index number. Repeaters position, angle, and time particles in order of their index. There must be variance in the spawn time for Time Repeater and Time Quantize to have an effect.

Custom Name

Renames the object so that it can be found more easily.