

# Particle systems

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## 1 General

The central element of a particle system is the so-called "emitter". In English this means "emitter" or "radiator" and it represents the unit that defines on the one hand the properties of the way the particles are created, their appearance and their behaviour. It is also the "starting point" of the emitted particles, which is why they can be assigned to a specific animation.

Particle systems always belong to a certain scenery object or vehicle.

## 2 Configuration

### 2.1 Creating

Particle systems are created and configured in the Object & Vehicle Tool; this is done in the "Particles" section on the left. There, any number of particle emitters can be created. This section contains the list of the created emitters with their controls and the button with which the particles can be assigned to an animation.

To create a new particle the button "+" is used. Then the name of the emitter is to be entered, with which it is listed. With the rectangle button the properties of the particle emitter can then be defined, which will be explained in the following section.

The remaining list buttons have the following functions:

- Arrow up/down: Moves the selected list element up or down.
- Double rectangle: Creates a copy of the selected element
- "X": Delete element

### 2.2 Properties

Variable	Meaning	Range
Origin: x, y and z	Coordinates of the emitting point	-

Variable	Meaning	Range
Direction For Speed: x, y and z	Direction vector at exit - only then do the physical principles apply	each [0-1]
Active	Couple activation to boolean variable, e.g. "Sanding"	boolean 😊
Color: red, green, blue	The 1 corresponds to 255 on the channel	each [0-1]
Rate	emissions per second, normally not exceeding 10	-
InitSizeM	Initial size in meters (approximately)	-
InitTransparency	Initial transparency	[0-1]
InitSpeedMPS	Initial speed	m/s
InitDurationS	Duration of the particles in seconds	-
AdditionalWindVeloc: x, y and z	With this option an additional (!) wind can be defined, which influences the movement of the particles. But the "normal" wind works in all cases!	m/s
GrowingRate	Growing rate	-
Friction	Friction: how much are the particles slowed down by the air?	-
FrictionOnEmitter	Friction: how much are the particles slowed down <i>relative to the emitter</i> ? The higher the value, the more the emitter "pulls" "its" particles with it	-
GravityInfluence	Gravity: 1 - parabola of a solid, 0 - unaffected, <0 - particles have buoyancy	-
SpeedVariation	Differences in the outlet velocity	[0-1[
TransparencyVariation	Differences in transparency	[0-1[
DirectionVariation	Differences in direction	>=0
DurationVariation	Differences in duration	[0-1[
SizeVariation	Differences in size	[0-1[
RateVariation	Differences in the rate	[0-1[

## 2.3 Animations

To assign an animation to the emitter, simply select the desired animation in the "Animations" section and then select the particle emitter in the "Particle" section and then click the "Uses selected animation" button.

## 2.4 Performance

In general, it is better to have a few, more intensive particles than many, more transparent particles - to protect the graphics card.