

VARIOUS METHODS OF BUILDING A FOG MACHINE

METHOD 1 –

- 1) Make sure to immerse the CO2 into heated water.
- 2) Modify your mist outlet to be a little closer to the water level, rather than trying to suck it out the top (CO2 fog is heavier than air, naturally, and you'll have an easier time of extracting it near the lower end of the mist.)
- 3) Dry ice is a very short term effect. To be most efficient, you should probably break the chunk ice up into smaller fragments. Large chunks will form a jacket of water ice around themselves, cutting down the effect after about 10 minutes. Small chunks will evaporate faster before they become shielded by the water ice. Thus, more fog per pound of dry ice.
- 4) Make sure there's a vent of some sort at the top of your barrel, so that the fans can have a draw of fresh air, and won't be working against a vacuum.
- 5) I've found it works much better if you have several smaller units than one or two really big units. The ones I've built were based around some 5 gallon buckets. One five gallon bucket with a heater for the water supply, and a second one upside down on top of it, which held the blower, the ice cage, and the "T" handle, for raising and lowering it into the water. I modified the lids, cutting circles out of their centers, and screwing them together, back to back, so the buckets can be snapped together for use. Plastic buckets work fine for heating the water in, so long as there's an inch or two of water between the bucket wall and the heating element. These foggers are cheap to make, easy to store, and two of them will cover a 20 X 30 stage for about 10 minutes before needing to re-heat and reloaded with CO2.

METHOD #2

You can make a small fog Maker using a crock pot, a plastic paint bucket, and a mesh basket taken from a deep fat fryer. This was the cheapest I've been able to make one, buying the pot at a flea market for \$5, the fan for about \$2 and the bucket was something I found in a junk pile. The hose was the tough part... had to pay about \$8 for that. A crock pot fogger won't cover a stage, but they are wonderful for fog leaking out from under a window, or door, from behind a set piece (like a grave stone, or some sort of prop machine going haywire.)

METHOD #3

We have built one using a 50 gallon drum and a 7000w heating element. The basket was made out of a number 3 washtub that was drilled full of holes. The lid on the drum had a door cut into it so that it could be opened to load the machine and then closed and locked when it was time to create fog. The drum was filled until the water was just below the level of the basket. We heated the water to about 190 degrees. It took a long time to heat that much water but it did allow us to produce some sustained fog effects. For a local high school project graduation, a big get together for the seniors after graduation put on by all the parents, we kept a 4 to 6 inch layer of fog in a room about 20' x 40' for over an hour. The room was constructed out of black plastic and pvc pipe suspended from the ceiling in the school football building. There were two openings for the students to enter and exit through. Just remember to be careful because when the dry ice comes into contact with the hot water it produces a rather violent reaction. We overloaded the machine once and it blew the hoses off. It did make for an amazing effect on the stage though.

METHOD #4

A tankless rapid-recovery water heater of the type often used in remote restrooms in small garage-size industrial spaces for a single shower can often 'keep up' with the water heating load. Some are even recirculating. A variable-height dry ice basket need not be fabricated. A quarter-turn valve allows you to quickly turn on and off, and adjust the volume of, the pressurized not-quite-boiling water coming out of a variable mist showerhead aimed at gravel-sized dry ice at the bottom of the drum. The heating systems designed for hot tubs normally can not achieve the sustained temperature required for fog machines, and often demand 30-50 amps

at 240 volts, rather than the 120 volt 20 amp, undersink units which can be powered by car batteries if required for inaccessible locations. This plan has a higher cost, but it will work continuously as long as you keep feeding it crushed dry ice, since the water can recirculate, if required.

METHOD #5

When I did this last year I used a tried and true method. I used a fifty gallon (steel) drum. The drum needs a "lockable" lid. In the bottom of this drum I put two 220V electric water heater elements. I drilled a one inch hole in the center of the lid. Near the edge of the lid I cut a hole to accommodate some dryer vent hose. I made a basket of metal mesh, and connected it to a rod that was about one inch in diameter. This rod goes in the one inch hole in the lid. The rod allows the basket to be lowered in the steel drum. I filled the drum about half full of water. I broke 20 pounds of dry ice into chunks and loaded it into the basket. I put the basket through the lid, and locked the lid onto the drum. I had also drilled two holes in the basket rod... for bolts. One allowed the basket to hang from the closed lid, above the hot water. When time came for the effect, we removed this bolt and lowered the basket with the dry ice chunks into the hot water. The second hole in the rod was placed so the basket would not "bottom out" on the heater elements. We put the bolt in this second hole after lowering the basket into the water.

We used no fans, and got a prodigious amount of fog. The fogger does need to be plugged in well beforehand to allow the water to heat up. The trick is submerging the dry ice chunks. Total cost of materials... \$40 for two of these machines. I bought two used but clean fifty gallon drums with locking lids for \$8 each from a local barrel recycler. I bought four heating elements online for \$12 total. I made the baskets myself, from "hardware cloth" purchased at True Value for about \$5 for both. I had the rod and some of the other electrical components already. I also made some "dollies" out of 2" x 2" x 1/8" angle iron and casters.

METHOD #6

To generate fog from dry ice all you need to do is to actually immerse the solid CO₂ in the hot water. This will cause the desired reaction and the mist will form nicely. The water must be hot, but NOT boiling. The outlet for the fog produced needs to be high enough so it's above the maximum water line, but low enough so that the fog effect will get out of the container. So if you have a pipe out of the trash can at waist level, that's probably too high. The idea of a grid in the bottom of the can is fine as long as it allows the CO₂ to become immersed. An expansion on a fixed grid is a wire bucket that can be lowered/raised as required, which means you can more easily prep and trigger the effect on demand. You shouldn't need fans on the device, but if you do, I'd a) recommend they're low voltage as you tend to generate a lot of condensation and b) run them at a fairly low speed. Most dry ice machines feed the fog at it's own pace. As for how to use the CO₂, it can depend on the effect you want. Granules, or broken up blocks, can often produce a much higher volume because of the greater surface area that is exposed to the water, although this can sometimes mean the water cools too fast. (Ideally use a thermostat on the water to keep it topped up to the best temp).

METHOD #7

Boiling the water serves only to heat up the resulting fog, making it react more like steam, and thus rising a little more than I'd expect from the effect. I've found that a constant sub-boiling temperature is best - not the easiest thing to do, but I'd say a thermostatically control element would work best. One thing that might sway your argument is if you load the basket with large amounts of the CO₂, which may in fact counteract the higher temp. However, doing that can render the fog tank a little uncontrollable in output and also use up more supplies than necessary. Fog from boiling water doesn't linger as long or as low. If you can put an adjustable thermostat on the machine you can tweak the temperature for the effect you want. Hotter water gives thicker fog -- great for hiding ballerinas. Lower temps thin out the fog, good for a creepy graveyard. If you have the time and budget to make a machine that sprays the water over the ice, I've found that they use ice more efficiently. Complete immersion creates a great initial effect but doesn't always have the legs that a spray machine will.

