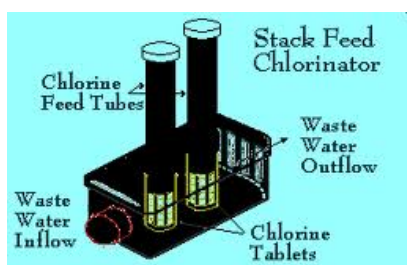
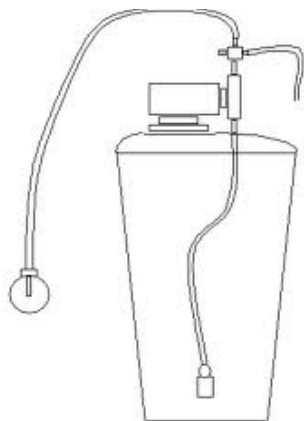


Disinfection Devices - Chlorinators

Chlorination is the most common form of disinfection as it is inexpensive to install and simple to manage. Following are two methods of chlorination most common in DEWATS.



Typical erosion style chlorinator. Chlorine is added to the wastewater as the tablets dissolve. TIP: chlorine tablets tend to cake in the moist environment. Remove and clean stacks every 2-3 months for best results.



Schematic diagram of a liquid chlorinator. The basin contains the chlorine solution, which can be made up from household bleach mixed with water (a 2:1 ratio of water to bleach is sufficient). The metering pump at the top of the basin sends doses of chlorine to the effluent where it is mixed to achieve the desired concentration. Use a swimming pool test kit to verify chlorine dose.

Background

Chlorine is available in solid, liquid and gaseous forms. Large municipal treatment plants may choose gaseous chlorine due to the cost savings, but there are many special health and safety requirements. For the purposes of small to medium sized DEWATS, chlorine in the form of liquid or solid is presented. Solid pellets or liquid bleach are more popular for smaller systems.

Chlorination requirements: Whichever form is used, three factors are important when designing chlorination systems: mixing, detention time and dosage:

- **Mixing:** thorough mixing is important for chlorination to ensure that the chemical comes in contact with the water as much as possible. The better the mixing the more effective the chlorination process will be. Often a series of baffles in the mixing pipe thoroughly mixes the effluent and chlorine together as it flows through to the contact chamber.
- **Detention time:** 15 to 25 minutes of contact time depending upon the temperature must be provided for chlorination to function properly.
- **Dosage:** A proper dose of between .2 to 2 mg/l is required to disinfect effluent to proper levels that are suitable for discharge. The proper dosage is determined by the amount of suspended solids in the wastewater effluent. Bacteria tend to be protected from the effect of the chlorine if there are many solids.

Erosion chlorinators. Chlorine in the solid form is commercially available in tablets that can be loaded into feeders plumbed in-line with the effluent piping. As the effluent passes through the feed tube and contacts the pellets, a dose of chlorine is imparted to the effluent as the pellets erode.

Liquid chlorinators: Liquid chlorine is readily available in the form of household bleach, or sodium hypochlorite, usually available at a 5 % concentration. The chlorine solution for the liquid disinfection unit is prepared in a product tank where the operator mixes a predetermined amount of water and bleach together to achieve the proper concentration. A metering pump is placed in the tank and a feed line connected to the effluent discharge pipe. The dosing pump has a variable discharge so the operator can cause more solution to be mixed with the effluent to be disinfected. Total Coliform tests will verify the results.