

Recommended Procedure for Disinfection of Small Quantities of Drinking Water

Many occasions arise which require the disinfection of small quantities of drinking water. Disinfection may be necessary because of temporary contamination of a supply which is satisfactory under normal conditions. It may be necessary to disinfect water that is contaminated during transportation.

Boiling is a very effective means of disinfection drinking water, but the process is bothersome and not often used. Chemical disinfection of small quantities of water for human consumption is much more popular, and if carefully accomplished is as effective as boiling.

Four items must be considered if chemical disinfection is to be effective: (1) the water must be free of turbidity or dirt, (2) the chemical must be applied in a sufficient amount to guarantee disinfection and must be uniformly distributed to contact every particle of water, (3) at least 30 minutes of contact time must be provided between the chemical and water to allow time for the chemical to destroy any disease causing bacteria or viruses, and (4) the water after treatment must be protected from further contamination.

The most widely used chemical for water disinfection is chlorine. This chemical is used by most municipal water systems and effectively destroys disease causing bacteria and viruses when applied in dosages far below the amount harmful to humans. The chemical can be purchased in the form of chlorine gas, chlorine powder, or liquid chlorine. Household bleaches such as Clorox and Hilex are liquid chlorine. This form is best for treatment of small quantities of water because no equipment is required and the liquid can be easily measured by a dropper, spoon, or measuring cup.

Typically household bleaches will be 5.25% available chlorine, although it is possible to have slightly different solution strengths depending on the particular product. The first step in disinfecting drinking water is to determine the % available chlorine in the solution that can be obtained from grocery stores.

The next step is to determine the amount of chlorine to use in properly treating a quantity of water. The following table gives the amount of chlorine necessary to treat given quantities of water. By knowing the amount of water to be treated, the amount of solution can be determined from the table.

Strength of Solution	Brand Name of Solution	Amount of Solution for Disinfection of Drinking Water				
		1 gal	2 gal	3 gal	4 gal	5 gal
5.25%	Clorox, Hilex, Purex	3 drops	6 drops	9 drops	12 drops	15 drops

The water to be treated should be placed in a clean container. After the chlorine solution is introduced into the water, it should be agitated slightly to mix the chlorine and water. The container should then be covered and the water allowed to stand for at least 30 minutes before using. An odor and taste of chlorine should be apparent. These will disappear with time, are entirely harmless to humans, and are your guarantee of safe drinking water.

**Recommended Procedure for Chlorine Disinfection of Spring Box,
 Elevated Storage, Ground Reservoir, Cistern, Water Treatment Plant Basin**

Introduction

A ground reservoir, elevated tank, spring box, cistern, or water treatment plant basin should be thoroughly cleaned and then disinfected with a strong chlorine solution after:

1. Original Construction
2. Any Repair or Maintenance
3. Flooding
4. A Period of Non-use
5. Two or More "Unsafe" Bacteriological Water Samples that are Traced to the Well

Adequate chlorine requires a certain chlorine dosage for a minimum contact time - 100 parts per million for 2 hours, or 50 parts per million for 8 hours, or 25 parts per million for 24 hours.

Chlorine for disinfection for these water systems can be either 5.25% sodium hypochlorite solution or 65% calcium hypochlorite powder. A 5.25% hypochlorite solution is common house-hold bleach such "Hilex", "Clorox", or "Purex" available at grocery stores and supermarkets. The 65% calcium hypochlorite powder is available from chemical supply houses and is known commercially as "HTH", Perchloron", or "Pitchlor".

Recommended Procedures

1. The unit to be disinfected should be full of water.
2. Determine recommended chlorine disinfection dosage for the desired contact time from the following table:

AMOUNT OF CHLORINE NECESSARY FOR DOSAGE AND TIME COMBINATIONS						
Volume of Box, Basin, Reservoir or Cistern	5.25% Sodium Hypochlorite (Bleach)			65% Calcium Hypochlorite		
	100ppm* for 2 hrs	50ppm* for 8hrs	25 ppm* for 24 hours	100 ppm* for 2 hrs	5 ppm* for 8hrs	25ppm* for 24 hours
50 gal	1½ cups	¾ cup	⅜ cup	--	--	--
100 gal	3 cups	1½ cups	¾ cup	--	--	--
200 gal	6 cups	3 cups	1½ cups	--	--	--
500 gal	1 gal	7½ cups	3 ¾ cups	9½ oz	--	--
1,000 gal	2 gals	1 gal	7½ cups	1 lb 3 oz	9½ oz	--
2,000 gal	4 gals	2 gals	1 gal	2 lb 6 oz	1 lb 3 oz	9½ oz
5,000 gal	--	5 gals	2½ gals	6 lbs	3 lbs	1 lb 8 oz
10,000 gal	--	--	5 gals	12 lbs	6 lbs	3 lbs
20,000 gal	--	--	--	24 lbs	12 lbs	6 lbs
50,000 gal	--	--	--	60 lbs	30 lbs	15 lbs
100,000 gal	--	--	--	120 lbs	60 lbs	30 lbs

*ppm = parts per million

3. Completely mix the chlorine dosage throughout the unit to be disinfected
4. Leave the chlorine solution in the unit for the recommended contact time.
5. Do not use the heavily chlorinated water.
6. At the end of the contact time, remove the water from the unit and discharge to waste.
DO NOT ALLOW THE WATER TO ENTER A RIVER, LAKE OR STREAM.
7. Fill the unit with clean water and collect a water sample for bacteriological testing after one or two days of use.