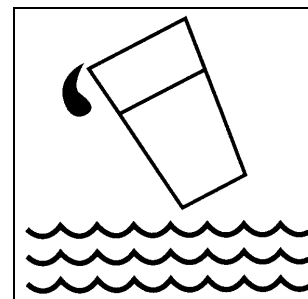


HTH® Dry Chlorinator for Use in: PRIVATE WATER SUPPLIES

Everyday and Emergency Guidelines



Advantages of HTH® Dry Chlorinator: *HTH® Dry Chlorinator, which contains 68% available chlorine, is calcium hypochlorite, one of the most effective sanitizers known. It is convenient, easy to use and handle, doesn't require expensive, complex metering equipment or large storage tanks, and doesn't lose strength rapidly during storage. Be sure to comply with all government regulations for use.*

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INTRODUCTION

Whether camping in the woods or camping out at home, fresh clean water is a necessity for life. Outdoor enthusiasts roughing it at a remote retreat may use running water from nearby streams or rainwater collected

in cisterns to fulfill this need. Many homes use natural spring well water kept in storage tanks, and those who are supplied with public water just turn the tap for fresh H₂O. But storms and other natural occurrences, broken water mains, pollution, etc., will contaminate a water supply, allowing harmful organisms to grow and prosper.

All these water sources need some sort of sanitization to safeguard health. Today nearly all public and private water supplies are made potable by treating with some form of chlorine. HTH® Dry Chlorinator contains 68% available chlorine in a convenient granular form.

When treating with HTH Dry Chlorinator, it is essential to add a sufficient amount to destroy all organic matter present and at the same time leave some available chlorine in the water.

The amount of available chlorine consumed in destroying the organic matter is commonly referred to as the "chlorine demand" of the water. The free available chlorine (that amount of available chlorine left over after destruction of germs and organic matter) is commonly known as the "chlorine residual" which must always be present for the water to be potable.

Some health authorities recommend that water be treated to give a "chlorine residual" of at least 0.2 parts per million (ppm) available chlorine. To accurately determine this treatment, a standard chlorine test should be used.

Consult your local public health officer on proper treatments or individual problems pertaining to local water supply.

CISTERNS AND STORAGE TANKS **Manual Methods**

While hypochlorination equipment may be used for treatment of storage tanks and cisterns, hand dosing may be adequate where disinfection is needed to assure the water is potable.

Initial Chlorine Dosage

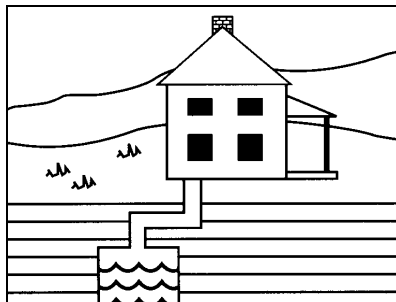
Calculate the volume of water to be treated (see below). Add the required amount of HTH[®] Dry Chlorinator to give a dosage of approximately 1 ppm available chlorine. *(Note that up to 10 ppm initial dose may be required depending on the levels of contamination in the water.)* Stir water slightly, let stand at least 20 minutes, then test for residual chlorine. If test does not show a chlorine residual, repeat the HTH Dry Chlorinator dosage until a satisfactory chlorine residual of at least 0.2 ppm is obtained.

Routine Chlorine Dosage

After the initial treatment, daily dosing with HTH Dry Chlorinator will help maintain water quality. Each day, add the required amount of HTH Dry Chlorinator to give a dosage of approximately 0.5 ppm available chlorine (Again, dosage depends on water quality). Maintain the chlorine residual at a satisfactory level. To make sure that the chlorine residual is maintained, test the water at least once a day.

NEW and RE-STARTED SUPPLIES

When new sources of water are first utilized, equipment and pipe should be sanitized with solutions of HTH[®] Dry Chlorinator to free them of contaminants. After this initial cleansing, testing for the presence of bacteria will



determine whether routine chlorination of the well water will be required to assure safe drinking water. In addition, occasionally, after periods of disuse or when the well has been contaminated through flooding or other problems, a treatment with sanitizing solutions will restore the lines and well to good condition.

Dug Wells

Upon completion of the casing (lining) wash the interior of the casing (lining) with a 100 ppm available chlorine solution using a stiff brush. This solution can be made by thoroughly mixing 15 grams of HTH Dry Chlorinator into 100 liters (1 oz./ 40 gallons) of water. After covering the well, pour the sanitizing solution into the well through both the pipe sleeve opening and the pipeline. Wash the exterior of the pump cylinder also with the sanitizing solution. Start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24

hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Contact your local Health Department for further details.

Drilled, Driven & Bored Wells

Run pump until water is as free from turbidity as possible. Pour a 100 ppm available chlorine sanitizing solution into the well. This solution can be made by thoroughly mixing 15 grams of HTH[®] Dry Chlorinator into 100 liters (1 oz./ 40 gallons) of water. Then add 20 to 40 liters (5 to 10 gallons) of clean, chlorinated water to the well in order to force the sanitizer into the rock formation. Wash the exterior of pump cylinder with the sanitizer. Drop pipeline into well, start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Deep wells with high water levels may necessitate the use of special methods for introduction of the sanitizer into the well. Consult your local Health Department for further details.

Flowing Artesian Wells

Artesian wells generally do not require disinfection. If analyses indicate persistent contamination, the well should be disinfected. Consult your local Health Department for further details.

PRIVATE SUPPLIES

Private water supplies may be found on farms, estates, and in homes located beyond the limits of the public distribution system. Camps, resorts, institutions and other similarly isolated groups are also often supplied by private water systems. The two most common sources of water for private supplies are wells and natural springs. Both deep and shallow wells are subject to contamination through many sources. These range from seepage of surface water to pollution of the underground stream by abandoned wells or sewage disposal facilities. Normal springs are also affected by underground sources, and they are particularly susceptible to pollution at the point where they come to the surface or where their surface waters are impounded by means of a reservoir or cistern.

Everyday treatment

Private water supplies serving single homes or small establishments may be easily protected by using small hypochlorinators, or simple gravity feeders. When feeding HTH[®] Dry Chlorinator solutions by this means, the point of introduction should be located preferably at the intake side of the pump and ahead of the gravity or pressure storage tank in the line of flow so that sufficient mixing and contact time may be allowed. It is best to maintain a residual of about 0.2 ppm after a 30-minute contact period with the solution.

Larger estates, summer camps, resorts, industrial supplies, etc., may be adequately and inexpensively served by a small, simple mechanical HTH Dry Chlorinator solution

feeder. It is preferable that the hypochlorinator feed into the suction side of the pump delivering water to the gravity or pressure storage tank. Where a constant speed pump operated by a float valve or pressure device is used, best results may be derived by connecting a constant feed-type hypochlorinator to the pump so that both may operate simultaneously. The degree of treatment required should be checked at regular intervals by sub-mitting water samples to a reliable laboratory. A 0.2 ppm residual after a 30-minute contact period is ordinarily employed.

A Continuous Method of Treating Water

In a clean plastic polyethylene or earthenware container, prepare a 1 or 2% available chlorine stock solution by adding HTH® Dry Chlorinator granular to the water while stirring with a clean wooden or plastic paddle. Let the small amount of insolubles settle to the bottom of the container then feed the upper solution by placing the plastic suction intake line with filter above the settled insolubles. Hypochlorite feeding equipment should be set up and maintained according to manufacturer's directions to automatically feed the HTH Dry Chlorinator hypochlorite stock solution into the water line to be treated so that a satisfactory chlorine residual is obtained. Test the chlorine residual at least once a day.

To make certain that the chlorine residual is at least 0.2 ppm, it is advisable to initiate a regular testing routine which should be carefully followed. Simple test kits for measuring the chlorine residual may be purchased from a local HTH Dry Chlorinator dealer.

EMERGENCY DISINFECTION

Calcium hypochlorite is a convenient and effective chlorine sanitizer used to destroy harmful bacteria which can contaminate water supplies. It is essential to add sufficient amounts to destroy all organic matter present, and at the same time leave some free chlorine available in the water. Free chlorine should be present in potable water during flood conditions. HTH® Dry Chlorinator is approved by the USEPA and meets AWWA standards for the treatment of water supplies.

Precautions when handling calcium hypochlorite

Proper use of calcium hypochlorite renders water safe from bacteria. Use clean utensils when measuring. Do not mix calcium hypochlorite with anything except water. Avoid contact with eyes and skin, and breathing dust. Store calcium hypochlorite in a cool, dry, well-ventilated area. DO NOT allow calcium hypochlorite to get wet. Keep out of children's reach.

Before initiating any procedure involving the use of calcium hypochlorite to treat water supplies or for disinfection purposes, contact your local health

department or local water department for advice and acceptance.

Drinking Water Disinfection

During periods of floods, exposure to disease is greater than normal. If there is any doubt about water purity, boil the water at least ten minutes then sanitize with a chlorine solution. Initially a total chlorine dosage of 10 ppm may be necessary. A chlorine residual of 0.2 to 5 ppm, after 30 minute contact time, is usually sufficient to disinfect most water supplies.

Treatment of Small Quantities

When boiling of water is not practical, water can be made potable by using HTH® Dry Chlorinator. Prior to addition of the sanitizer, remove all suspended material by filtration or by allowing it to settle to the bottom. Decant the clarified, contaminated water to a clean container and add 1 grain of this product to 4 liters of water. One grain is approximately the size of the letter "o" in this sentence. *Alternatively, the stock solution prepared below may be used at the rate of 1 milliliter per liter (or roughly 1 teaspoon per gallon.)* Allow the treated water to stand for 30 minutes. Properly treated water should have a slight chlorine odor, if not, repeat dosage and allow the water to stand an additional 15 minutes. The treated water can then be made palatable by pouring it between clean containers several times.

Dosage Rates for Potable Water

1. First determine the volume of water to be treated and the amount of product or solution required. (See below)
2. Add an initial dosage of 10 ppm.
3. Add HTH® Dry Chlorinator slowly to water supply. NEVER ADD WATER TO CHEMICAL. Stir with clean utensils.
4. Let stand for at least 30 minutes, allowing ample contact time for chlorine to combat contaminants.
5. After a minimum of 30 minutes, test water for chlorine residual. A reliable pool test kit with DPD reagents should be used. DPD reagents produce a pink/red color. Do not use water unless a pink/red color is visible. If no pool test kit is available, verify the presence of a slight chlorine odor as above.
6. If no color is present with the DPD test kit, repeat addition of calcium hypochlorite. Residual should be 0.2 - 5.0 ppm. DO NOT CONSUME WATER IF RESIDUAL IS BELOW 0.2 PPM FREE CHLORINE or NO CHLORINE ODOR IS DETECTED.
7. Stored water should be treated routinely by addition of a 0.5 ppm dose to ensure chlorine residual is maintained. Test water supply frequently.

Preparation of Stock Solution

As an alternative to addition of solid HTH[®] Dry Chlorinator, a stock chlorine solution can be prepared by dissolving calcium hypochlorite in water. Prepare a 1 % available chlorine solution by adding 15 g HTH Dry Chlorinator to 1 liter of clear water. (2 oz/gallon) One teaspoon of this stock solution, when added to one gallon of water, (1 mL/Liter) will render clear water safe for drinking purposes under most conditions.

Chlorine solutions deteriorate gradually when standing; therefore, it is necessary to store in a covered container away from direct sunlight. Fresh solution should be prepared as needed to meet the required chlorine residual in the treated water.

Well Water Disinfection

If the well is contaminated by flood waters, add sufficient stock solution (see above) to give a residual of at least 0.2 ppm free chlorine. Once established, DO NOT use for 8 hours, then pump out muddy water. Have your water supply tested by local health authorities as soon as possible.

Swimming Pool Disinfection

To ensure that pool water remains bacteria- and algae free during power outages or after flooding, manual addition of HTH[®] Dry Chlorinator is recommended. Adjust pH (7.2-7.6) and add 15 g/ m³ of HTH (2 ozs. of calcium hypochlorite per 1,000 gallons of water).

General Disinfection Procedure

When water recedes, all surfaces should be cleaned and disinfected. Remove silt and refuse by washing with

detergents then rinse with stock solution of calcium hypochlorite containing 2% available chlorine. A musty odor indicates additional washing is required. For mildew or algae, a stronger stock solution (60 g / liter or 7.5 ozs / gallon) should be used.

Calculating Volumes of Tanks and Dosages

For the volume of a rectangular tank (in cubic meters or cubic feet):

Volume = Length x Width x Height (all in either m or ft)

For the volume of a circular tank (in cubic meters or cubic feet):

Volume = 3.14 x Radius x Radius x Height (all in either m or ft)

Number of liters = Volume in cubic meters x 1000.

Number of gallons equals Volume in cubic feet x 7.48

Dosage in grams of calcium hypochlorite = (desired ppm) x volume in cubic meters x 1.5

For a dosage in pounds of calcium hypochlorite:

Dosage = [(desired ppm) x (Volume in gallons) x 8.34] divided by 650,000

NOTE: 1 lb. = 454 grams = 16 ounces (1 Ounce = 28 grams)

1 Teaspoon of calcium hypochlorite = approx. 0.12 ozs. 1 teaspoon of solution is approximately 5 mL)

RELATED INFORMATION

HTH[®] Dry Chlorinator -- Product Data Bulletin
AD6158-297

HTH[®] Dry Chlorinator for Use in: Cleaning and
Sanitizing HTHADS97-6

HTH[®] Dry Chlorinator for Use in: Municipal Water and
Wastewater HTHADS97-7

Please refer to the Material Safety Data Sheet (MSDS) for complete information on Storage and Handling, Toxicological Properties, Personal Protection, First Aid, Spill and Leak Procedures, and Waste Disposal. To order an MSDS, call your Olin sales office. Review the MSDS thoroughly before handling product.

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