

## Dry Calcium Hypochlorite

Powdered or granulated chlorine, such as calcium hypochlorite, has a ten year shelf life if stored in a cool, dark place. Be careful where you store it. It is a hazardous chemical which can cause chemical burns to the skin, eyes and mucous membranes. Take precautions by wearing gloves and protective eyewear when handling. The amount of available chlorine is important. Calcium hypochlorite can be purchased in several concentrations. Purchase a brand which has at least 68 percent available chlorine. A one pound bag can disinfect thousands of gallons of water. Do not store large amounts. One pound is plenty for an entire family.

The Departments of the Army, Navy, and Air Force released a publication entitled, *Sanitary Control and Surveillance of Field Water Supplies*, on 1 May 2010 where they set standards for use of calcium hypochlorite for water disinfection in the military (U.S. Army Center for Health Promotion and Preventive Medicine 2003). The calculations to create a stock solution from dry calcium hypochlorite on the table below are taken from those military standards.

They recommend, *"If your measuring device is not as precise as the number you come up with, it is generally advisable to round the calculated number up to ensure you get at least the dose you intended to provide."* To simplify measurements the calculations on the table have been rounded up with the exact amount in parenthesis to the right. The standard calculation for a 5 percent stock solution is based on dissolving one teaspoon of 68-70 percent dry calcium hypochlorite in 1 ½ cups of water.

<b>5 % Chlorine Stock Solution Recipe Homemade Liquid Bleach -- Do not drink!</b>	
<b>Water</b>	<b>Dry Calcium Hypochlorite</b>
1 ½ cup	1 teaspoon
1 quart	1 Tablespoon (2.7 teaspoons)
2 quarts	2 Tablespoons (5.3 teaspoons)
1 gallon	4 Tablespoons (10.7 teaspoons)

Liquid chlorine is volatile and will gradually reduce in strength over a short period of time in storage. Dry calcium hypochlorite is stable and can be stored for many years. Making up small, fresh batches of homemade liquid chlorine bleach will ensure its effectiveness in deactivating pathogens in drinking water. The solution can be used to disinfect water following the same directions provided for liquid household bleach.

<b>Household Bleach Water Disinfection</b>		
<b>Amount of Water</b>	<b>Amount of Bleach Clear Water</b>	<b>Amount of Bleach Cloudy or Questionable Water</b>
<b>1 quart</b>	2 drops	4 drops
<b>2 quarts</b>	4 drops	8 drops
<b>1 gallon</b>	8 drops	16 drops
<b>5 gallons</b>	½ teaspoon	1 teaspoon
<b>15 gallons</b>	1 ½ teaspoon	1 tablespoon
<b>30 gallons</b>	1 tablespoon	2 tablespoons
<b>55 gallons</b>	5 ½ teaspoons	11 teaspoons

When using the stock solution to disinfect drinking water, the military standard recommends mixing and allowing water to stand for a minimum of 30 minutes to ensure adequate disinfection time prior to consuming. Extremely cold water may require additional chlorine or longer contact time to deactivate pathogens in the water.

Dry calcium hypochlorite can be used to disinfect a 55 gallon barrel of water. Fill the barrel with at least 50 gallons of clarified water. Add 1/8 teaspoon of dry bleach powder. Seal the barrel and wait at least 24 hours before consuming. The water should have a slight chlorine odor. If not, repeat the process.