

MAKING OF DISINFECTANT FOR DISINFECTING WORKING SERVICES IN COMBATING COVID-19 WITH CALCIUM HYPOCHLORITE 65

Lifewater-Kenya and affiliate of Lifewater-Canada initiated a program of offering disinfectant at water wells they have installed. Householders take a liter (quart) at a time to sanitize dishes, food preparation surfaces, cutlery, utensils, raw food, toilet surfaces, door handles, and similar things at their homes. The same is done at schools to sanitize possible virus transmission points.

Lifewater-Kenya has placed a 250 liter (about 61 gallon) tank at each well:



1. Local well managers initially get 1 kilogram (about 2.2 pounds) of calcium hypochlorite powder labeled as 65% available chlorine. (70% would be satisfactory. Any error would be too small to worry about.). They can be resupplied, as needed. A standard teaspoon is a common item. One level teaspoon holds 5 cubic cm (online conversion). Calcium hypochlorite powder bulk density is 1.0 g/cubic cm (Source: Material Safety Data Sheet online). Therefore, one level teaspoon holds 5g of powder.

CAUTIONS:

1. The chemical powder and liquid in the pre-mix container will damage clothes, skin, and eyes.
2. Be prepared to quickly wash away any that spills on clothing or a person.
3. Water in the 250 liter tank will smell, but should not be dangerous – **HOWEVER, DO NOT DRINK IT.**
4. A little bit of white limey sediment will accumulate in the pre-mix or large tank, but it is not a problem. It may be placed in a small hole and covered with dirt.

PREPARATION METHOD

2. Items needed:
 - a. Container of calcium hypochlorite powder
 - b. A **clean, dry** piece of metal, paper, or board
 - c. A **clean, dry** knife, nail, stick for separating a pile of powder into small piles
 - d. One standard teaspoon
 - e. A container holding one litre of water for pre-mixing the powder and water. Pre-mixing is required to be sure the powder does not simply drop to the bottom of the large tank.
 - f. A 250 litre or 60 gallon tank of water
3. Our tank capacity at the water projects is 250 litres.
4. Now, using the dosage of 10mg/l and our tank's capacity of 250litres we shall need $[(10 \times 250) / 0.65]$ g of the calcium hypochlorite powder, which equals $2500\text{mg} / 1000 \text{ mg per g} / 0.65 = 3.8\text{g}$ of calcium hypochlorite.

5. A level teaspoon will equal 5g of powder, BUT we only want a bit more than three-fourths of that:
 - a. Take one leveled teaspoon of the powder, which will be 5g of powder.
 - b. Place it on a **clean, dry** piece of metal, paper, or board.
 - c. Split the pile into four equal pieces
 - d. Carefully and cleanly put about three-fourths of one small pile back into the original container.
6. Place the remaining three small piles plus the bit of the fourth pile of powder into the one litre (or one quart) of pre-mixing water.
7. Stir well, being careful to not get it on clothes or skin.
8. Add to the large tank.
9. Stir well with a clean stick or pipe.
10. The 250 litre mixture is ready for use.
11. Clean all tools with new water, as a safety measure.
12. **IF we want a 13.5mg/l concentration, which will fall within the common 15 mg/l international maximum dose, we can use the entire level teaspoon of powder.** That will be simpler and allow a little extra to compensate for weakening during the 5 days
13. If other tank sizes must be used, all measurements can be easily changed by simple ratio calculations.

WHEN TO MAKE NEW DISINFECTANT WATER:

IF DISINFECTANT WATER REMAINS IN THE 250 LITRE TANK AT THE END OF FIVE (5) DAYS, IT WILL HAVE LOST SOME OF ITS POWER TO KILL VIRUSES AND BACTERIA, ESPECIALLY IN HOT CLIMATES AND SEASONS.

MAKE A NEW BATCH OF DISINFECTANT WATER ON THE SIXTH DAY, if not done before that.

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“Please do not sell that disinfectant. Give it out free in the spirit of fighting Covid-19 pandemic. Encourage families to take at least 1 litre of the disinfectant and once finished, to come for another one.

Note.

-That disinfectant is not for drinking but is for disinfecting our working surfaces in the houses and at our place of work just as we are sanitizing our hands to protect us from the infection of Corona virus.

-The Householders should be advised to **NOT** further dilute the solution.

May the Good Lord save us from this pandemic of Covid-19.

GOD BLESS YOU ALL.

From: Rev. David W. Maina
 Managing Director
 The Lifewater Kenya

NOTE: This method was developed in Kenya and, any errors in this paper are mine after consultation with Lifewater-Canada and Lifewater-Kenya. Through discussion we raised the chlorine dosage to 10 mg/l, which served my family well for two years in the tropics. I am intrigued by the ingenuity and simplicity of the Lifewater-Kenya method. I believe its use will also reduce intestinal and other chronic food and waterborne problems in using communities. Use after COVID-19 goes away should still be helpful.

Robert Jarrett, Retired Public Health and Water Engineer, 25 Jun 2020