



## USING THE H<sub>2</sub>gO DISINFECTANT AS A HAND SANITIZER

Liquid chlorine is made from the electrolysis of sodium chloride (salt) brine. It is commonly referred to as bleach. Commercial bleach is typically 12 to 15% (120,000 to 150,000 mg/l) chlorine with the balance being water. Household bleach is typically 6% (60,000 mg/l) chlorine. On-site generated chlorine is generated at 0.5% to 0.8% (5,000 to 8,000 mg/l) concentration, much lower than commercial or household bleach. A milligram/liter (mg/l) is commonly also referred to as a part per million (ppm).

Liquid chlorine has been used for decades for drinking water disinfection, wastewater treatment, aquatics, cooling towers, industrial settings and households. It is also used as a sanitizer in health care settings to clean floors, surgical areas, and many other applications.

During the Ebola outbreak in Africa in 2014-2016, the Center for Disease Control and Prevention (CDC) recommended strong and mild chlorine disinfectants for use in a variety of applications. For surface cleaning and in health care settings where it is not directly exposed to skin, the CDC recommends a chlorine concentration of 5,000 mg/l. For washing or rinsing hands, they recommend 500 mg/l. <https://www.cdc.gov/vhf/ebola/pdf/2.6-percent-chlorine-bleach-solution.pdf>. Other studies by well-known manufacturers of cleaning products have shown that 200 mg/l dose is adequate for normal household surface cleaning resulting in 99.9% or greater kill of virus and bacteria.

The Aqua Research H<sub>2</sub>gO Global and Prime small hand-held devices are designed to produce the correct concentration for the volume of drinking water the user wants to treat. The following chart shows the number of cell chamber volumes, at the maximum device setting (20 liters for Global or 10 liters for Prime) that have to be added to the volume of water shown to produce the corresponding concentration. The number of applications is the same for both the Global and the Prime since both have the same cell chamber concentration at the maximum volume setting. For 5,000 ppm solution, it is probably impractical to add enough doses to make that concentration since it takes 10 times the number of doses as the 500 ppm solution. Without softening agents, chlorine-based disinfectants at 500 or 200 ppm may be harsh on the skin when used over extended periods of time.

<u>Volume of Water</u>	<u># of H<sub>2</sub>gO treatments at the max setting to add to water to make a 500 ppm solution</u>	<u># of H<sub>2</sub>gO Treatments at the max setting to add to water to make a 200 ppm solution</u>
1 cup (~250 ml)	3	1
1 pint (~500 ml)	5	2
1 quart (~1 liter)	10	4
1 gallon (~4 liters)	40	15