



USING ON-SITE GENERATED CHLORINE AS A SANITIZER

WARNING: DO NOT INGEST OR INJECT SODIUM HYPOCHLORITE INTO HUMANS!

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 in the 0.4% to 0.8% (4,000 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, as well as household applications such as clothes bleaching. It is also used as a sanitizing agent in health care settings to clean floors, counters, 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 4,000 to 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.

Aqua Research commercial electro-chlorination systems are designed to produce the strong solution (approximately 5,000 ppm) directly from the system. The mild solution (500 ppm) is made by diluting the strong solution by adding about 10 parts of water to each part of the solution coming directly from the Stream system. More dilute solutions such as 200 ppm are made by diluting with 25 parts of water for each part of the straight disinfectant from the on-site generator.

As alcohol-based hand sanitizers with glycerin and other softening agents become scarce in outbreak situations, chlorine-based disinfectants are simple to make effective alternatives. However, without the softening agents, chlorine-based disinfectants are more harsh on the skin when used over extended periods of time.