Why Use Hypochlor Instead of Bleach

There is a striking difference between the Hypochlor chlorine delivery system and bleach. When chlorine gas is added to water it forms hypochlorous acid (HOCl) which is an excellent germ killer. Hypochlorous acid provides free available chlorine.

The reaction is: Cl_2 + H_2O ⇄ HOCl + HCl

Chlorine | **Water** | **Hypochlorous Acid Free Chlorine** | **Hydrochloric Acid**

Problems develop when chlorine gas is added to water and allowed to sit and age. Just as champagne or carbonated water "go flat" on sitting as the bubbly carbon dioxide gas escapes into the air, chlorine escapes from a hypochlorous acid solution thus weakening its germ killing value. In order to slow this escape, bleach manufacturers add sodium hydroxide (lye) to their product causing the pH to rise dramatically. Lye burns animal and plant tissues, it saponifies fats, burns human tissue causes skin dermatitis it corrodes metals and destroys most fabrics. Hypochlorous acid dispensed from Hypochlor contains NO LYE!

Second, Chlorine in water splits into two forms, hypochlorous acid (HOCl) and hypochlorite (OCl^-). At the high pH the chlorine solution provided by bleach, chlorine is in the hypochlorite form. The chlorine provided by Hypochlor is in the Hypochlorus (HOCl).

That reaction is: HOCl ⇄ H^+ + OCl^-

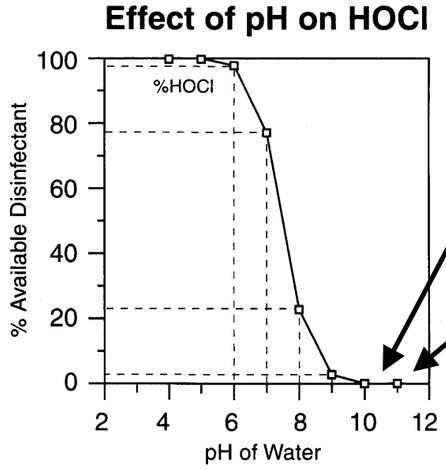
Hypochlorous Acid Strong Germ Killer | **Hydrogen Ion** | **Hypochlorite Ion Weak Germ Killer**

How much of each is present in a chlorine solution is totally dependent upon the pH of the solution. As pH rises, less hypochlorous acid and more hypochlorite is in the solution. As the pH rises, less germ killing power is available. According to a University of Illinois study, HOCl is 120 times more effective as a sanitizer than the -OCl ion.

Even at dilutions as low as 1 ounce of bleach to a gallon of water, the pH of the solution is 10.25 and all of chlorine is in the hypochlorite form (-OCl) ion.

Third, When a chlorine solution is does not contain enough HOCl to satisfy the chlorine demand of the surface to be disinfected, chloramines will form as chlorine and nitrogen-based materials combine. Examples of nitrogen-based materials are proteins and blood. Chloramines are responsible for the obnoxious odor sometimes associated with chlorine disinfection. The obnoxious, pungent, eye-stinging smell of chloramines, mistakenly identified as free chlorine, indicates that the chlorine/water mix is not effective. There is not enough HOCl to satisfy the chlorine demand

Fourth, Bleach has a problem with shelf-life stability. Under normal storage it starts to deteriorate immediately after manufacture and will lose up to 50% of its potency in less than 60 days from date of manufacture as it reverts back to sodium chloride (table salt).



IF WE DILUTE:

1 ounce of bleach to 1 gallon with water (1:128), the pH of the solution is 10.25!

1/2 cup of bleach to 1 gallon with water (1:32); the pH of the solution is 11.00!

AT THOSE pH LEVELS, THERE IS NO HYPOCHLOROUS ACID AVAILABLE FOR GERM KILLING!

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TO PROPERLY DISINFECT AN AEREA, PICE OF EQUIPMENT, BATHROOM, ETC.
YOU MUST FIRST REMOVE AS MUCH ORGANIC MATTER (DIRT) AS POSSIBLE YOU MUST HAVE THE CORRECT Ph, THE CORRECT CONCENTRATION, ppm, or mV, THE CORRECT AMOUNT OF SOLUTION, gpm, AND THE CORRECT AMOUNT OF TIME, min., TO DESTROY ALL ORGANISMS.

UNLESS ENOUGH OF THE PROPER DISINFECTANT SOLUTION COMES IN CONTACT FOR THE REQUIRED TIME WITH THE ORGANISM, THE ORGANISM WILL NOT BE DESTROYED.

IF ANY OF THE AVBOVE FACTORS IS MISSING, PROPER DISINFECTION WILL NOT BE ADCHIVED

THE HYPOCHLOR SYSTEM WILL DO THIS FOR YOU

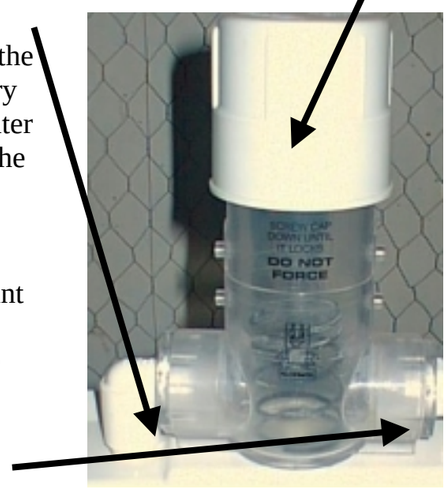
THE HYPOCHLOR SYSTEM PROVIDES STABLE, SOLID 68% AVAILABLE CHLORINE TO ASSURE THAT THE GERM KILLING AND OXIDIZING POWER YOU NEED IS THE STRONGEST AVAILABLE AT THE TIME WHEN YOU NEED IT!
AND, THERE IS NEVER A NEED TO RINSE!!

ALL AT A COST OF ABOUT A PENNY PER GALLON!

The absolute ease of use is the main benefit of using the Hypochlor point-of-use chlorine delivery system. Tablets are furnished in the cartridge shown on the left. The screw top of the Hypochlor dispenser, shown on the right, is removed and the cartridge is inserted into the dispenser.

Simply attach to a water hose. A spring regulates the exposure of individual dry chlorine tablets to the water stream flowing through the dispenser.

Screwing the top up or down regulates the amount of chlorine in the discharged solution. One unit is capable of delivering +/-20 to 100 ppm at +/- 10gpm



After use, the Hypochlor cartridge is simply thrown away and replaced with another. There is no need for you or your personnel ever to come into contact with individual tablets. Because of its point-of-use design Hypochlor eliminates the need for proportioners, complex metering devices and batch mixing of chemicals by your workers. Since there is no batch mixing and negligible clean-up time, Hypochlor limits worker liability while enhancing worker safety.

WHAT COULD BE MORE SIMPLE OR SAFE?

. “The difference between Cal Hypo and “Bleach” as disinfectants” Stanley R. Pickens, Ph. D. PPG Industries, Inc. Chemical Technical Center.

Geo. Clifford White (1992) The Handbook of Chlorination and Alternative Disinfectants, 3rd edition. Van Nostrand Reinhold, NY 1992

S. S. Block Disinfection, Sterilization, and Preservation.5th edition. Lippincott Williams & Wilkinscal, New York,

NOTE TO PUBLIC OFFICIALS: The Hypochlorous Acid delivery system employed by Hypochlor has many other uses in the public health field. For Hazmat use, it can be used to decontaminate equipment of pathogens without the hydroxyl alkalinity found in Sodium Hypochlorite solutions that is damaging to aluminum, rubber or some plastic equipment. Free Available Chlorine levels can be adjusted up to 100 +/- 10ppm with one unit.
WHEN DISINFECTING WITH CHLORINE SOLUTIONS, MAKE SUSRE THAT THE PROPER pH, ppm, AND CONTACT TIMES ARE OBSERVED, AND THAT THE PRODUCTS ARE EPA REGISTERED FOR THE INTENDED USE