



HOCL Solution EPA Registered No. 92108-1-96303

EPA Est No. 92108-SC-1

In addition to being on **EPA's N-List**  
to be effective against novel coronavirus which causes Covid19  
below is a list of other Pathogens and viruses that HOCL has proven to kill.

### **Viruses Non Enveloped**

**KILLS** Adenovirus (1 or Type 1) (Strain 71) (ATCC VR-1)

**KILLS** Norovirus or Norwalk Virus (as Feline Calicivirus) (Strain F-9) (ATCC VR-782)

**KILLS** Rhinovirus (16 or Type 16) (Strain 11757) (ATCC VR-283)

**KILLS** Rotavirus (A or Group A) (Strain WA) (ATCC VR-2018)

### **Viruses Enveloped**

**KILLS** Canine distemper virus (ATCC VR-1587) [(Strain Snyder Hill)]

**KILLS** [Human] Hepatitis C [Virus] [(as bovine diarrhea virus)] [(HCV)] [(Strain ADL)] [(ATCC VR-1422)]

**KILLS** Human Immunodeficiency Virus Type 1 (HIV-1), strain IIIB (clade B); ZeptoMetrix

**KILLS** Influenza A (H1N1) Virus [(Strain A/Virginia/ATCC1/2009)] [(ATCC VR-1736)] [(flu virus)]

**KILLS** Influenza A Virus (H1N1) A Swine/1976/31 (ATCC VR-99) (flu virus)

**KILLS** Respiratory Syncytial Virus (RSV) (Strain A-2) (ATCC VR-1540)

**KILLS** Swine Flu Virus (H1N1) A Swine/1976/31 (ATCC VR-99)

### **Yeast**

**KILLS** Candida albicans (ATCC 10231)

### **Bloodborne Pathogens**

**KILLS** [Human] Hepatitis C [Virus] [(as bovine diarrhea virus)] [(HCV)] [(Strain ADL)] [(ATCC VR-1422)]

**KILLS** Human Immunodeficiency Virus Type 1 (HIV-1), strain IIIB (clade B); ZeptoMetrix

### **Bacteria**

**KILLS** Bordetella bronchiseptica [Kennel Cough] (ATCC 10580)

**KILLS** Clostridium difficile -spore (C. Diff or C difficile) (spores) (ATCC 43598)

**KILLS** Escherichia coli (E coli) (ATCC 11229)

**KILLS** Klebsiella pneumoniae New Delhi Metallo-Beta Lactamase (NDM-1)

**KILLS** Carbapenem Resistant (CRE)

**KILLS** Listeria monocytogenes (Listeria) (ATCC 7644)

**KILLS** Methicillin-Resistant Staphylococcus aureus (MRSA) (ATCC 33591)

**KILLS** Pseudomonas aeruginosa (Pseudomonas) (ATCC 15442)

**KILLS** Salmonella enterica (Salmonella) (ATCC 10708)

**KILLS** Staphylococcus aureus (Staph) (ATCC 6538)

**KILLS** Vancomycin Resistant Enterococcus faecalis (VRE) (ATCC 51229)

### **Mycobacterium**

**KILLS** Mycobacterium bovis, BCG (Tuberculosis -or -TB)

### **Parvoviruses Non Enveloped**

**KILLS** Canine parvovirus (ATCC VR-2016) [(Strain Cornell)]

### **Food-Contact Surface Bacteria**

**KILLS** Salmonella and Staphylococcus



## Fact Sheet

# Disinfection Using Chlorine Bleach

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## Efficacy

Chlorine kills microorganisms by oxidizing free sulfhydryl groups, disruption of cell membrane and wall components, and degradation of a variety of cellular macromolecules.

The efficacy of the various forms of chlorine in water at killing microorganisms is as follows:

$\text{HOCl} > \text{OCl}^- > \text{inorganic chloramines} > \text{organic chloramines}$

The above hierarchy clearly shows that free chlorine is more efficacious than combined chlorine. Also, as noted above, **HOCl is 100 times more effective as a disinfectant than  $\text{OCl}^-$ . Consequently, free chlorine is most effective at a pH of 5 to 7, where HOCl is the predominant form.** The efficacy declines with increased pH.

- At a pH of 7.5, it is about 50/50 HOCl and  $\text{OCl}^-$ .

- At a pH of 8.0, it is about 20 percent HOCl and 80 percent  $\text{OCl}^-$ .

**HOCl is 80 to 300 times more effective than  $\text{OCl}^-$ . For instance, it is more than 100 times more effective than  $\text{OCl}^-$  against cysts and 60 to 70 times more effective against *E. coli*. The activity of  $\text{OCl}^-$  as a sanitizer therefore can be compared to that of chloramines, (i.e. much below that of HOCl).**

For good bacteriological quality, it is therefore essential to maintain a proper HOCl level in the water at all times. Total free chlorine readings, which combine both HOCl and  $\text{OCl}^-$ , cannot be depended upon for proper water maintenance.

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