Hypochlorous Acid (HOCl) Features, Approvals, and Uses

Educational information on **Hypochlorous Acid** (**HOCl**) can be found at **www.hypochlorousacidinfo.com**

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THE PROBLEM:

- Many disinfectants include cleaning agents which require that surfaces be wiped and, in some cases, rinsed after application thus causing extra labor, especially in large areas like stadiums, classrooms, and lobbies.
- Many disinfectants contain quaternary ammonium compounds (quats) or phenolics which can be harmful to the user and the environment. In fact, per the Safety Data Sheets (SDS), many quats and phenolics contain warnings regarding protection of eyes, skin, and lungs and therefore require extensive personal protective equipment (PPE) as a precaution. And should there be an inadvertent spill, those SDSs outline the multiple steps that must be taken for proper cleanup.
- Given the high demand for disinfectants and virucides, many quats and phenolic-based products are in short supply.
- And finally, many disinfectants sold are NOT properly registered with the Federal or state agency putting the user at risk of a fine.

BACKGROUND ON HOCl:

- Made in white blood cells of every mammal to kill germs
- Made outside of body using salt, water and electricity.
- Available for purchase pre-packaged in bottles, pails, drums, and totes
- Made on-the-fly using HOCl generators *(use as it's produced in drinking water and for swimming pools)*

FEATURES:

- Eco-Friendly: HOCl is made from salt and once deactivated, it turns back into saline
- Safe on most fabrics: HOCl is less aggressive on fabrics than chlorine bleach
- 100 times more powerful than bleach
- No rinse required, even on food contact surfaces
- Very effective disinfecting large areas using ultra low fogger, electrostatic foggers, or drum mounted foggers: Formulated for use with mechanical, manual, or battery/power operated sprayers
- Given the abundance of salt, water and electricity, there are never shortages of HOCl products
- Effective against a wide range of bacteria and viruses including human Corona Virus (see EPA claims)
- Extremely safe to use: SDS typically indicates:
  * Safe for eyes, skin, ingestion, or inhalation
  * Non-Flammable – No Harmful Chemicals
  * No signal words or warnings needed on SDS
  * No Personal Protective Equipment (PPE) Needed
  * HMIS ratings of 0-0-0-0 which is the same as WATER
- Included on the USDA Generally Regarded As Safe (GRAS) list of edible substances
- Can be used in the eyes, mouth and on the skin for medicinal purposes
- Safe for humans: HOCl is safe enough to disinfect personal items for a baby
- Free from chlorine and phosphates
- Safe for everyday use
- Very low to no odor.
- Used as a surface disinfectant/sanitizer which does not need to be rinsed (Save time: no need to spray, rinse and wipe)
- Kills odor causing bacteria
- Kills bacteria that can cause food poisoning
- Non-abrasive and non-corrosive

PUBLICATIONS

New! June 2020 Hypochlorous Acid: A Review

Block MS, Rowan BG. Hypochlorous Acid: A Review. J Oral Maxillofac Surg. 2020;78(9):1461-1466
doi:10.1016/j.joms.2020.06.029

Hypochlorous Acid (HOCl): Summary of United States Regulation

FDA Food Contact Notification 1811

Hypochlorous Acid at up to 60 ppm for Produce, Fish & Seafood, Meat and Poultry Sanitation

Hypochlorous acid may be used in processing facilities at up to 60 ppm for use in process water or ice which comes into contact with food as a spray, wash, rinse, dip, chiller water, and scalding water for whole or cut meat and poultry, including carcasses, parts, trim, and organs; in process water, ice, or brine used for washing, rinsing, or cooling of processed and pre-formed meat and poultry products as defined in 21 CFR 170.3(n)(29) and 21 CFR 170.3(n)(34), respectively; in process water or ice for washing, rinsing or cooling fruits, vegetables, whole or cut fish and seafood; and in process water for washing or rinsing shell eggs. Visit https://www.fda.gov/food.

FDA Guidance for Industry

Guide to Minimize Microbial Food Safety Hazards of Fresh-cut Fruits and Vegetables

The antimicrobial activity of a chlorine-based disinfectant depends on the amount of hypochlorous acid (also called "free chlorine") present in the water. The amount of hypochlorous acid in the water depends upon the pH of the water, the amount of organic material in the water, and, to some extent, the temperature of the water. If the amount of hypochlorous acid is not maintained when the amount of organic material increases, the antimicrobial agent may lose effectiveness in maintaining water quality. If a fresh-cut processor uses a chlorine-containing compound as a disinfectant, it is recommended that the processor monitor the processing water for free chlorine or hypochlorous acid concentrations. Visit https://www.fda.gov/food.

EPA Food-Contact Surface Sanitizing Solutions

Allowance of Hypochlorous Acid at up to 200 ppm

The following chemical substances when used as ingredients in an antimicrobial pesticide formulation may be applied to food-contact surfaces in public eating places, dairy-processing equipment, and food-processing equipment and utensils. When ready for use, the end-use concentration of all hypochlorous acid chemicals in the solution is not to exceed 200 ppm determined as total available chlorine. Visit https://www.epa.gov/.

FDA

FCN 1811 - Hypochlorous acid
October 13, 2017

Chapter V. Methods to Reduce/Eliminate Pathogens from Produce and Fresh-Cut Produce - Dec. 16,2014 C

Guide to Minimize Microbial Food Safety Hazards of Fresh-cut Fruits and Vegetables - February 2008

USDA

Memorandum updates the status of electrolyzed water (hypochlorous acid) under the U.S. Department of Agriculture (USDA) organic regulations at 7 CFR Part 205

USDA FSIS Directive: Safe and Suitable Ingredients used in the Production of Meat, Poultry, and Egg Products

USDA National Organic Program - Hypochlorous Acid Updates

EPA

National Primary Drinking Water Regulations - Hypochlorous Acid at up to 4 ppm

Food-Contact Surface Sanitizing Solutions: Allowance of Hypochlorous Acid at up to 200 ppm.

Substance Registry Services (SRS) - Hypochlorous Acid

Applications

Produce Processing
Seafood Processing
Meat Processing
Poultry Processing
Food Contact Surfaces
Beverage Manufacturing
Biofilm Control
Livestock Health
Agriculture
Water Treatment
Medical
Dental
Hospital Sanitation

Where Used

Attics
Basements
Crawl Spaces
Public Buildings
Common Areas
Automotive
Public Transportation
Multi-Family Housing
Residential Housing
Commercial Real Estate
Hotels and Motels
Institutional Facilities
Correctional Facilities
Military Installation Offices
Athletic Facilities
Retail Stores
Churches
Colleges
Kitchens
Veterinary Premises
Barber Shops
Farms
Airports
Cruise Ships
Schools
Day Care Centers
Nurseries
Hospitals
Aging Care Facilities
Nursing Homes
Ambulances
Surgery Centers
Health Care Facilities
Clinics
Medical and Dental Offices
Restaurants
Cafeterias
Institutional Kitchens
Food Processing Plants
Dormitories
Classrooms
Bathrooms
Public Restrooms
Tanning Salons

Hypochlorous Acid (HOCl): Summary of United States Regulation

EPA CERTIFIED CLAIMS FOR HOCl *(pH-neutral Hypochlorous Acid) AS ACTIVE INGREDIENT*

SANITIZER FOR FOOD-CONTACT SURFACES
Efficacy >100PPM HOCl - 1 Minute

- Escherichia coli – ATCC 11229
- Klebsiella pneumoniae – ATCC 10031
- Proteus mirabilis – ATCC 7002
- Salmonella Enterica – (Subspecies Enterica Serovar Typhi) – ATCC 6539
- Salmonella typhi – ATCC 19430
- Salmonella enterica (tested as Salmonella choleraesuis) – ATCC 14028
- Staphylococcus Aureus – ATCC 6538
- Streptococcus pneumoniae – ATCC 6305

SANITIZER FOR FOOD-CONTACT SURFACES
Efficacy <200PPM HOCl – 2 Minutes

- Escherichia coli – ATCC 11229
- Salmonella typhi – ATCC 6539

SANITIZER FOR FOOD-CONTACT SURFACES
Efficacy <200PPM HOCl – 5 Minutes

- Enterobacter aerogenes – ATCC13048
- Escherichia coli – ATCC 11229
- Salmonella entérica – ATCC 10708
- Staphylococcus aureus – ATCC 6538
- Staphylococcus aureus (HA-MRSA) – ATCC 33591
- Streptococcus pneumoniae – ATCC 19615
- Vancomycin Resistant Enterococcus Faecalis (VRE) – ATCC 51575

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DISINFECTANT FOR HARD NON-POROUS SURFACES
Efficacy >250PPM HOCl – 10 Minutes

- Acinobacter baumannii – ATCC 19606
- Escherichia coli O157: H7 – ATCC 35150
- Escheria Coli – ATCC 11229
- Escherichia coli (NDM) – ATCC BAA-2469
- Clostridium difficile spore (C. Diff) – ATCC 43598
- Herpes Simplex virus Type 1 – ATCC VR-733
- Herpes Simplex virus Type 2 – ATCC VR-734
- HIV Type 1 (HIV) – Strain HTLV-IIIb
- Human Immunodeficiency Virus Type 1 (HIV-1), strain IIIB (clade B); ZeptoMetrix
- Human corona virus – ATCC VR-740, stain 229E
- Influenza A (H1N1) – ATCC VR-1469
- Klebsiella pneumonia New Delhi MetalloBeta Lactamase (NDM-1) Carbapenem Resistant, CDC 10002
- Listeria monocytogenes – ATCC 19111
- Listeria monocytogenes – ATCC 7644
- Mycobacterium bovis, BCG (Tuberculosis or TB) – ATCC 35734
- Propionibacterium acnes – ATCC 6919
- Pseudomonas aeruginosa – ATCC 15442
- Rhinovirus Type 37 – ATCC VR1147, Strain 151-1
- Respiratory Syncytial Virus (RSV) – ATCC VR-26
- Salmonella entérica – ATCC 10708
- Staphylococcus aureus – ATCC 6538
- Staphylococcus aureus (HA-MRSA) – ATCC 33591
- Staphylococcus aureus (HA-MRSA) – ATCC 33592
- Serratia marcesens – ATC 14756
- Streptococcus pyogenes – ATCC 19615
- Trichophyton mentogrophytes – ATCC 9533
- Swine influenza Virus (H1N1) – ATCC VR 99
- Vancomycin Resistant Enterococcus feacalis (VRE) – ATCC 700221
- Vancomycin Resistant Enterococcus faecalis (VRE)- ATCC 51229

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