



What is PPM Testing?

ECA Technology - PPM

PPM in HOCl technology measures **parts per million of free available chlorine (FAC)**, which includes both active HOCl and the weaker OCl^- form (1 ppm = 1 mg/L chlorine).

Why Aren't PPM Readings Alone Enough

A PPM reading tells you the ppm quantity (E.g. 100 ppm) but not quality of disinfection power.

Always Use PPM and ORP Readings

Always verify ORP >750 mV alongside PPM. Example: High PPM + low ORP = ineffective solution. As HOCl PPM levels vary by application, with regulatory limits and safety considerations.

PPM by Application

Application	PPM Range	Authority/Notes
Skin/Wounds	20-50 ppm	Medical grade, non-irritating
Produce Wash	20-60 ppm	FDA no-rinse max 60 ppm
Food Contact Surfaces	50-200 ppm	Health Canada/FDA/EPA standard
Hand Sanitizer	100-200 ppm	Effective, skin-safe
General Surfaces	100-200 ppm	Household/commercial
Heavy Sanitation	200-500 ppm	Floors, equipment
High Level Disinfection/Biofilm	500+ ppm	Hospitals, max strength

Key Guidelines

Always verify ORP >750 mV alongside PPM for true efficacy

- Lower PPM prioritizes safety (skin/food); higher PPM prioritizes speed
- 60 ppm max on edible produce (FDA FCN 1811)
- 200 ppm max food contact surfaces (EPA)

Know Your Risks Within PPM Settings

Safety Limits by Exposure

PPM	Skin/Eyes	Inhalation	Ingestion	Regulatory Max
20-50	Safe	Safe	Safe	Medical/wounds
50-200	Safe	Safe (ventilated)	Avoid	Food contact
200-500	Irritation possible	Eye/throat irritation	Nausea/vomiting	Industrial
>500	Burns	Respiratory distress	Gastric damage	Not for human contact

How to Test PPM Settings

Method	Description	Photo
Test strips (easiest)	Dip Hydrion or LaMotte strips (10-2000 ppm range) for 1-2 seconds, match color to chart within 10 seconds	
Colorimeter (accurate)	DPD test kits or photometric meters read absorbance at 530nm. Example: Hanna HI 97771C	
Titration (precise)	Iodometric method with starch indicator and sodium thiosulfate. Example: Hach Company Nitrogen, Nitrite Test Kit, Model NI-15	

Side Effects of High PPM (>500) Settings

- Skin: Redness, irritation, chemical burns (>1000 ppm)
- Eyes: Conjunctivitis, corneal damage
- Inhalation: Cough, throat irritation, pulmonary edema at very high vapor (>200 ppm mist)

HOCL PPM Guidelines for Healthcare Disinfection

HOCl ppm requirements for healthcare disinfection typically range from 100-500 ppm, depending on the specific application and regulatory standards.

Application	PPM Range	Contact Time	Notes
Patient Rooms/Surfaces	100-200 ppm	1 min	EPA standard surfaces
High-Risk Areas	200-500 ppm	30 sec	Hospitals, labs, 80x > bleach
Wound Care	50-150 ppm	Continuous	FDA cleared, skin-safe
Medical Devices	100-200 ppm	1-5 min	Non-critical instruments
Airborne Fogging	200-300 ppm	5-10 min	HVAC, ventilation systems

HOCl PPM Guidelines for Agriculture and Irrigation

For agriculture and irrigation, optimal HOCl PPM is typically 0.5-3 ppm for continuous use, balancing pathogen control with plant safety.

Application	PPM Range	Purpose	Notes
Irrigation Water	0.5-2 ppm	Pathogen control	Safe residual at emitters
Hydroponics	0.3-2.5 ppm	Line cleaning	Prevents biofilm, low phytotoxicity
Foliar Spray	100-200 ppm	Disease prevention	Routine crop protection
Spot Treatment	200-400 ppm	Active infections	Higher dose, limited exposure
Equipment Cleaning	200-500 ppm	Sanitizing tools	Between crop cycles

HOCl PPM Guidelines for Poultry

A common working range in poultry biosecurity is 50-100 ppm for sprayed or liquid surface disinfection, with some final disinfection steps going higher depending on the task and label directions. Research cited in poultry settings showed 50 or 100 ppm, pH 6, inactivated E. coli and Salmonella within 5 seconds on surfaces.

Why Poultry Operators Like HOCl

HOCl is attractive in poultry because it acts fast, leaves little to no toxic residue, and can be used around animals and equipment when properly applied. It is especially useful where you want repeated biosecurity steps without harsh caustic or persistent chemical residues.

HOCl PPM Guidelines for Dairy

HOCl is used in dairy for barn sanitation, milking equipment cleaning, teat sanitation, water treatment, and CIP/process-water hygiene.

Where HOCl is Used in Dairy Operations

- Milking equipment and pipelines: HOCl can be used to sanitize teat cups, hoses, pipelines, and stainless-steel contact surfaces to help lower bacterial counts in milk.
- Barns, stalls, and calf areas: It's used on calf pens, stalls, walls, floors, boot baths, and entry points to reduce pathogen load.
- Water systems: Dairy operations use HOCl to disinfect drinking and process water and to help control biofilm in water lines.
- CIP and process hygiene: Some dairy systems use HOCl as part of CIP or as a substitute/reduction strategy for other disinfectants such as peracetic acid.

Typical Dairy Concentrations

For food-contact and dairy surface sanitation, the sources point to 20–30 ppm as effective, with up to 200 ppm allowed for food-contact surfaces depending on application and compliance context. For broader farm sanitation and equipment disinfection, higher working strengths like 50–100 ppm are commonly discussed in dairy and livestock settings.

Why Dairies Use It

HOCl is attractive because it is fast acting, leaves little residue, and can be used around animals and equipment when applied correctly. It is also used to improve milk hygiene by reducing microbial contamination in the environment and on surfaces that touch milk.

HOCl PPM Guidelines for Swine / Pig

HOCl is widely used in swine/pig operations for barn disinfection, fogging, water sanitation, and biosecurity.

Swine / Pig HOCl Applications

- Empty barns/pens: Spray or fog walls, floors, slats, feeders to kill Salmonella, E. coli, APP, PRRS
- Water lines: Sanitize drinking water systems (0.5-2 ppm continuous)
- Fogging/misting: Aerosol disinfection of air (0.25-1 ppm fog concentration) reduces airborne pathogens
- Footbaths/vehicles: Entrance biosecurity stations
- Equipment: Feeders, tools, transport

Swine / Pig Recommended HOCl PPM Levels

Application	PPM Range	Contact Time	Notes
Barn fogging	50-200 ppm	10-30 min	Safe around animals
Surface spray	100-200 ppm	5-10 min	Empty buildings
Water lines	0.5-2 ppm	Continuous	Biofilm control
Aerosol	0.25-1 ppm	3-5 hrs	Pig farm air studies



**Where to Read PPM on a
Kirkmayer HOCl Generator**
(The PPM Sensor is an option)

Ready to Upgrade Your Disinfection?

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GENERATORS**

**SYSTEM
CAPACITIES**

**SYSTEM DATA
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