

## Why the Hospital Disinfecting Spiral Hasn't Worked and How We Can Finally Fix the Problem

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### 1. The Disinfection Game

The hospital disinfection game is a deceptively simple one. Bacteria occur naturally, and some cause disease. Humans try to kill the bacteria. The bacteria evolve to resist each method of killing. Humans create a more potent way of killing the bacteria. The bacteria evolve again. Coincidentally, many companies profit from the game by marketing new and more powerful products. Meanwhile, the humans are already losing, because during the process, 'superbugs' are harming people while the humans are busy designing better killing solutions. And the humans who apply these deadly products are at an ever-growing occupational health risk.

The situation health care facilities face seems to be a no-win situation. It is generally accepted that more frequent and thorough cleaning of the health care environment reduces the number of hospital-acquired infections. However, reliance on disinfecting to decontaminate the health care environment has encouraged poor cleaning practice, and outbreaks of hospital-acquired infections like C difficile are increasing rather than decreasing.

### 2. The Switch to Sporicidals

Health facilities have responded by demanding more potent disinfectants. New products have been offered by industry with kill claims of astronomical proportion - 31 different pathogens in one minute for some bactericidal disinfectants, and five-minute claim for some sporicidal disinfectants.

Unfortunately, there is a limit to the cycle of increasing disinfectant toxicity to match pathogen resistance. In the effort to increase effectiveness, this approach has increased damage to human health, by stimulating the production of resistant bacterial strains, and by exposing cleaning staff to harmful materials. More potent disinfectants also cause physical damage to equipment and surfaces, which in turn makes cleaning more difficult.

Up until now, sporicidal disinfectants have been the last line of defense against pathogens. Before, this class of disinfectants was only used as a chemical sterilizing agent. In fact, the CDC 2008 guidelines recommended that such high-level disinfectants should not be used on environmental surfaces.

### 3. The Downside of Sporicidals

The emergence of spore forming bacteria as a major class of hospital acquired infections has stimulated many corporations to bring to market a variety of new disinfectants, some of which are registered to kill bacterial spores:

- *4.5 % hydrogen peroxide disinfectants*
- *Peracetic acid (hydrogen peroxide, acetic acid and a catalyst like sulfuric acid)*
- *5000 to 5500 parts per million of sodium hypochlorite.*

All of these chemicals have long-term occupational health issues. Reactive byproducts of high concentrations of these oxidizers can contaminate the indoor environment and pose real occupational health and safety issues for cleaning staff, medical staff and patients. The high chemical concentrations also damage many equipment and hospital surfaces. When the porosity of surfaces increase, they are far more difficult to clean, even with high-level sporicides.

When cleaning is inadequate, there is soil remaining on environmental surfaces that makes disinfecting less efficient. When live vegetative bacteria remain on surfaces, they are exposed to residual surfactant-based detergents and low-level disinfecting agents, both of which promote further sporulation and development of resistance.

## 4. A New Approach:

### (A) PCS New Neutral pH low concentration sodium hypochlorite's.

#### Safe Effective and Environmentally Responsible.

- Commercial Sodium hypochlorite has a pH of 12.5 that is hundreds of thousand times ( 100,000 ) more alkali than PCS neutral pH sodium hypochlorite's.
- Most hospital disinfectants containing alkali sodium hypochlorite are used at concentrations of 5000 ppm . PCS neutral pH solutions are recommended for use at concentrations containing 95 percent less sodium hypochlorite 250 ppm.

### (B) Validating cleaning processes with CREMCO Quantitative Carrier Test # 3 ( QCT-3 )

- Ground breaking microbiological laboratory testing method..
- Measures pathogen removal and transfer with various chemicals, cleaning cloths or wipes and cleaning processes.
- Method can be used to test vegetative bacteria, viruses and bacterial spores.

After many test PCS gathered data which provided evidence that wiping surfaces with pre moistened wipes or microfibre cloths with all major classes of disinfectant cleaners that Norovirus PFU's ( Plaque Forming Units) and C. difficile spores where transferred to cleaned surfaces. This was very surprising as all surfaces where cleaned twice with two separate pre moistened wipes or microfiber cloths.

Process Cleaning Solutions (PCS) has developed a new cleaning process that does rival disinfecting for reducing bacteria, viruses and spore counts on environmental surfaces. It is now physically possible for health care facilities to clean in a way that physically removes pathogens equal to or better than that achieved by disinfectants containing high concentrations of chemicals with highly alkali or acid ph values. Without transferring Murine norovirus or C. difficile spores to cleaned surfaces. In other words, physical removal has finally trumped disinfecting. The disinfecting spiral, with all its downsides, can stop.

## 5. PCS QCT-3-9 Cleaning Process- Cleaning without transferring pathogens to cleaned surfaces.

Use to clean frequently touched surfaces. Apply to surface and wipe dry with microfibre cloth or other clean dry absorbent cloth. Using PCS QCT-3 -9 Cleaning Process of apply and dry removes large numbers of pathogens without transferring to cleaned surfaces, including vegetative bacteria, Murine norovirus and C. difficile spores.

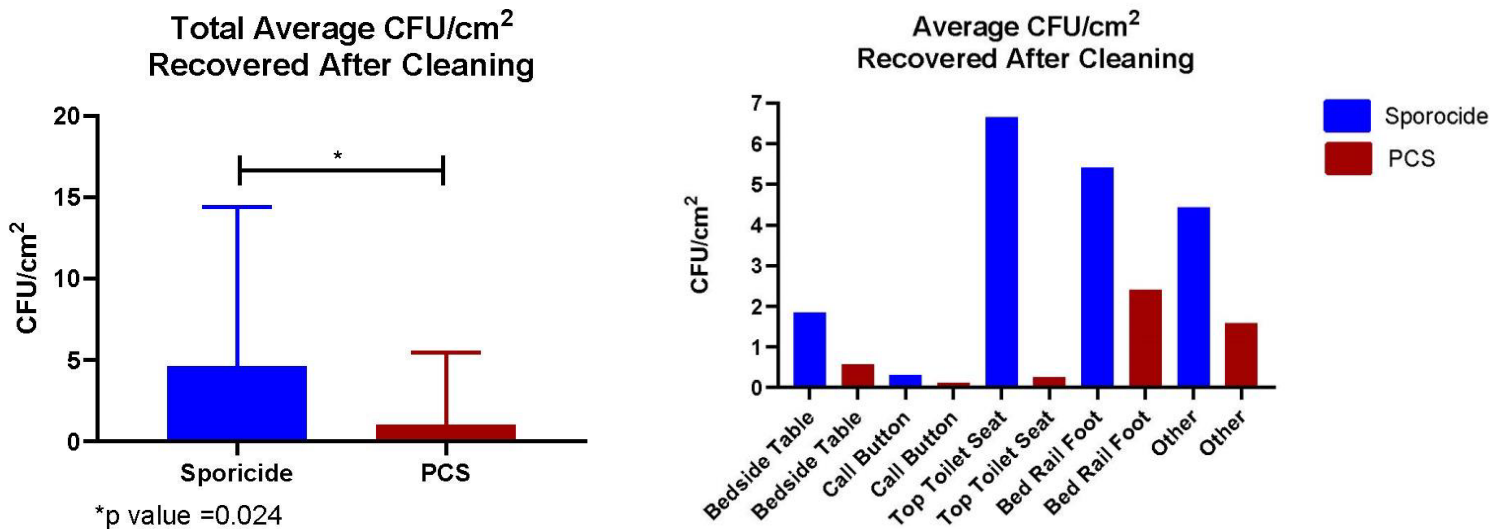
## CLEANING PROCESS vs. SPORICIDAL DISINFECTION

**Objectives:** To evaluate the efficacy of using an "apply and dry" cleaning process of microfiber combined with a low concentration of non-caustic, non-toxic, neutral pH, sodium hypochlorite solution against the efficacy of using a sporicidal daily disinfection with air dry.

**Methods:** This study was conducted in the GI ward of a large university hospital in the U.S.

- Microbiological swab samples were collected for 3 days, pre (n=30) and post (n=60) daily cleaning of patient rooms with a sporicidal disinfectant that was allowed to air dry at least 5 minutes before sampling.
- Cleaning staff were then trained on applying the PCS product with immediate drying using a microfiber cloth.
- Microbiological samples were again collected before (n=45) and after (n=60) daily cleaning of patient rooms with the PCS product.
- All swab samples were taken and analyzed by NSF International. Samples were analyzed for Total Aerobic Colony Counts (ACC) and presence/absence of Clostridium difficile.

**Results:** All 180 samples were negative for the presence of C. difficile.



**Conclusions:** The use of a low concentration of non-caustic, non-toxic, neutral pH, sodium hypochlorite solution that was applied using a disposable wipe followed by immediate drying with a microfiber cloth demonstrated equal or better efficacy than applying a sporicidal that was allowed to air dry.

[Click here for full report](#)

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# PCS 250 Oxidizing Disinfectant/Disinfectant Cleaner

Use to clean frequently touched surfaces. Apply to surface and wipe dry.

DIN: 02314843

- ✓ SAFE
- ✓ EFFECTIVE
- ✓ ENVIRONMENTALLY RESPONSIBLE
- ✓ CLEANING WITHOUT TRANSFERRING PATHOGENS.

1. One hundred thousand times (100,000) less alkali than competitive bleach wipes.
2. Contains ninety five (95%) percent less active ingredient than competitive bleach or hydrogen peroxide products.
3. Use to clean frequently touched surfaces apply and dry save time, your equipment and the environment. \*Follow label instructions for cleaning frequently touched surfaces when using Health Canada approved disinfectant cleaners.
4. Validated cleaning process QCT-3-9 proven to remove very large numbers of vegetative bacteria, Murine norovirus and C. difficile spores without transferring to cleaned surfaces. Wiping surfaces with pre moistened disinfectant wipes or clothes transfers Murine norovirus and C.difficile spores to cleaned surfaces. This occurs with all major classes of disinfectants.
5. Natural formulation contains no synthetic chemicals. Endorsed and certified by the Envirodesic™ Certification Program for Maximum Indoor Air Quality™ and minimum environmental health impact.

Removal of hospital pathogens does not require high concentrations of chemicals with high alkali or acid pH values.

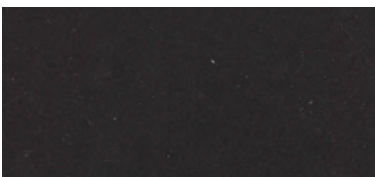


## “Disinfectant Residues Should Be Removed”

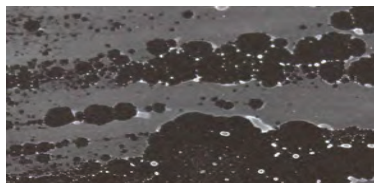
“Widely Used Benzalkonium Chloride Disinfectants Can Promote Antibiotic Resistance”

Biofilms on dry hospital surfaces

Adaptation of host transmission cycle during Clostridium difficile speciation



No Residue



Residue



**Neutral PH PCS 250 Oxidizing Disinfectant/Disinfectant Cleaner  
DIN 02314843**



Code	Description	Case Pack
#5908NPH-6	946 mL	6/cs
#5908NPH-2.5	2.5 L	4/cs.
#5908NPH-4	3.78 L	4/cs.

**Neutral PH PCS 250 Oxidizing Disinfectant/ Disinfectant Cleaner Wipe Kit  
Wipe Kit**

Code	Description	Case Pack
#6048-6	70 container wipes 7" x 12" 500 mL container PCS 250 Oxidizing Disinfectant/ Disinfectant Cleaner	6/cs.

**Neutral PH PCS250 Oxidizing Disinfectant Wipes**



Code	Description	Case Pack
#6044BTL-4	7" x 12" x 270 wipes per bucket. Moisten wipes by adding 2.5 litres of Neutral PH PCS 250 Oxidizing Disinfectant/Disinfectant Cleaner to each bucket.	4/cs.
#6044BTL-12	7 inch x 12 inch x 70 wipes per canister. Moisten wipes in canister with 500 ml of Neutral PH PCS 250 Oxidizing Disinfectant/Disinfectant Cleaner.	12/cs.
#6045BTL-4	12 inch x 12.5 inch x 110 wipes per bucket. Moisten wipes in bucket with 2.5 litres of Neutral PH PCS 250 Oxidizing Disinfectant/Disinfectant Cleaner.	4/cs.

**PCS Nylon Reinforced Dry Wipes**

Code	Description	Case Pack
#856	Ply 200 wipes per dispensing carton	6/cs.



**Microfibre Clothes**

Code	Description	Case Pack
#PCSMF- BLUE	Blue, 300 gram weight	300/cs.
#PCSMF-GREEN	Green, 300 gram weight	300/cs.
#PCSMF-YELLOW	Yellow, 300 gram weight	300/cs.
#PCSMF-RED	Red, 300 gram weight	300/cs.



**PCS Pump Up Sprayer**

Code	Description	Case Pack
#7548	2 litre, For spray and wipe dry	ea.

## PCS QCT-3-9 Cleaning Process

Cleaning without transferring pathogens to cleaned surfaces.

Use to clean frequently touched surfaces. Apply to surface and wipe dry with microfibre cloth or other clean dry absorbent cloth.

Wiping surfaces with pre-moistened disinfecting wipes or cloths removes bacteria, viruses and C. difficile spores but in the process some are transferred to cleaned surfaces.

Using PCS QCT-3-9 Cleaning Process of apply and dry removes large numbers of pathogens without transferring to cleaned surfaces, including vegetative bacteria, norovirus and C. difficile spores.



### Health care

- Use to deep clean during outbreaks and for patient room discharge cleaning.
- Clean all washrooms particularly when norovirus or C. difficile spores may be present, emergency departments and isolation room washrooms.
- Clean non critical medical equipment without leaving any chemical residue.
- Surfaces where food is served and prepared.
- Frequently touched surfaces in public and patient spaces.



### Long term care

- Clean frequently touched surfaces, washrooms, non critical equipment and surfaces where food is served and prepared.
- Deep cleaning during outbreaks.



### Schools and public spaces

- Use to clean washrooms and frequently touched surfaces.
- Food preparation and service areas.
- Frequent deep cleaning during outbreaks.



### Homeless shelters and daycares

- Cleaning to protecting public health.
- Clean frequently touched surfaces not damaged by water.
- Frequently clean washrooms, areas where food is prepared and served.

### International corporations serving the public

- Use to clean all frequently touched food contact surfaces including, trays touch screens, glass displays and any surface not damaged by water.
- Use to safely clean washroom surfaces frequently.

### Vetenary clinics and shelters

- Use to clean surfaces frequently.
- QCT-3-9 Cleaning Process
- Removes pathogens and prevents their transfer to cleaned surfaces.
- Ideal choice for use where little or no chemical residue is preferred.

## Use QCT-3-9 Cleaning Process with any of the following PCS products

NPH 160 Neutral PH Oxidizing Cleaner, Disinfectant and No Rinse Sanitizer. RTU

PCS 250 Neutral PH Oxidizing Disinfectant Cleaner RTU

PCS 250 Concentrated Oxidizing Disinfectant Cleaner (Dilute through NPH dispenser)

PCS 7000 Disinfectant Cleaner (Concentrate dilute through NPH dispenser)

# PCS QCT 3-9 VALIDATED CLEANING PROCESS

**Reduces hospital pathogenic organic soil more effectively than most currently used hospital cleaning and disinfecting processes.**

## SAFE

- Neutral pH low concentration product is safer for equipment and staff.
- Endorsed and certified by the Envirodesic™ Certification Program for Maximum Indoor Air Quality™ and minimum environmental health impact.

## EFFECTIVE

- Cleaning to a scientifically validated standard.
- PCS validates its recommended environmental surface decontamination processes with CREM Co Labs newly developed third tier of the Quantitative Carrier Test Method (QCT-3) to assess decontamination of high-touch environmental surfaces (HITES) with the incorporation of field-relevant wiping.
- Maximize physical removal by wiping and use the minimum amount of chemical.

## ENVIRONMENTALLY RESPONSIBLE

- PCS Neutral pH solutions form equilibrium of 50% hypochlorous acid and sodium hypochlorite which are effective at very low concentrations.
- When combined with our validated wiping process health care facilities can reduce staff and environmental exposure of cleaning and disinfecting chemicals in many cases by 95%. This also reduces health care, institutions and most public facilities discharge of toxic chemicals into the environment through the release of waste water.
- Removal of hospital pathogens does not require high concentrations of chemicals with high alkali or acid pH values.
- Easy to use process that saves time.

## MATERIALS REQUIRED

- PCS microfibre cloths laundered with PCS Oxidizing Laundry Detergent.
- PCS 7548 pump sprayer filled with diluted Neutral pH PCS Oxidizing Cleaning, disinfecting and or Sanitizing Solution
- \* Pre-moistened microfibre cloths or wipes

## PCS QCT- 3- 9 VALIDATED CLEANING PROCESS

- Apply to surfaces to be cleaned, apply from cleanest to dirtiest.
- Take clean dry folded PCS microfibre or equivalent absorbent disposable cloth and wipe surfaces dry moving from cleanest surfaces to dirtiest.
- Suitable for use as instructed on commonly touched surfaces and equipment in health care and public spaces.
- Once PCS microfibre or absorbent cloth becomes saturated replace with dry cloth.

\*Remove gross organic soil prior to cleaning

Vegetative Bacteria ( <i>S. aureus</i> and <i>S. marcescens</i> ) Average CFU per square centimetre							
Product	CFU/cm <sup>2</sup>			Percent		Average Percent	
	Control	After Wiping	Transfer	Reduction	Transfer	Reduction	Transfer
Apply & Dry Test 1	27,000	0	0	100	0	100	0
Apply & Dry Test 2	35,000	0	0	100	0		

<i>C. difficile</i> spores Average CFU per square centimetre							
Product	CFU/cm <sup>2</sup>			Percent		Average Percent	
	Control	After Wiping	Transfer	Reduction	Transfer	Reduction	Transfer
Apply & Dry Test 1	27,000	3.57	0	99.99	0	99.95	0
Apply & Dry Test 2	9,240	8.15	0	99.91	0		

Murine Norovirus Average PFU per square centimetre							
Product	PFU/cm <sup>2</sup>			Percent		Average Percent	
	Control	After Wiping	Transfer	Reduction	Transfer	Reduction	Transfer
Apply & Dry Test 1	4,333	0	0	100	0	100	0
Apply & Dry Test 2	18,386	0	0	100	0		



## Cleaning with pre-moistened disinfecting wipes or cloths transfer bacteria, viruses and C. difficile spores to clean surfaces.



Pre-moistened disinfectant wipes or microfibre cloths are the most common method of cleaning in health care environments. Cleaning the areas around patients, noncritical patient care equipment and washrooms with pre-moistened wipes or microfibre cloths remove soil bacteria, viruses and C. difficile spores.

What is not common knowledge, is the process of wiping surfaces with pre-moistened wipe or cloth in addition to removing pathogens the process inherently transfers bacteria, viruses and C. difficile spores to surfaces being cleaned.

Many published papers have reported the transfer of Norovirus from wiping surfaces with pre-moistened cloths. PCS testing using CREM.Co Quantitative Carrier Test Method number three QCT-3 also demonstrated transferring viruses to clean surfaces by wiping with pre-moistened wipes or cloths

### Wiping with pre moistened wipes or microfibre cloths. PCS CREM Co Quantitative Carrier Test QCT-3 Murine Norovirus

Product Used	Transfer PFU/cm2
Saline T Detergent MF transfer of Murine Norovirus to clean surface	7.67
Saline T Detergent MF transfer of Murine Norovirus to clean surface	8.49
PCS NPH 250 MF transfer of Murine Norovirus to clean surface	9.34
PCS NPH 250 MF transfer of Murine Norovirus to clean surface	7.64
Hydrogen Peroxide 0.5% Wipe transfer of Murine Norovirus to clean surface	8.49

PCS testing using CREM.Co Quantitative Carrier Test Method number three QCT-3 in seven separate studies report the transfer of C. difficile spores to clean surfaces when wiped with pre-moistened disinfectant wipes or wiped with a pre-dampened microfibre cloth. All test were conducted with surfaces being wiped with two separate pre-moistened wipes or cloths.

### PCS CREM Co Quantitative Carrier Test QCT-3 C. difficile

Product Used	Transfer CFU/cm2
Saline T Detergent transfer of C. difficile to clean surfaces MF	296
PCS 7000 transfer of C. difficile to clean surfaces MF	0.31
Hydrogen Peroxide 1.4% Wipe transfer of C. difficile to clean surface	15.3
Quaternary Alcohol Wipe transfer of C. difficile to clean surface	161
PCS MicroClean transfer of C. difficile to clean surface MF	116
PCS MicroClean followed by NPH 250 transfer of C. difficile to clean surface MF	14.7
PCS NPH 250 transfer of C. difficile to clean surface MF	2.33

## PCS QCT-3-9 Cleaning Process Apply Neutral PH PCS Oxidizing Disinfectant Cleaner & Wipe Dry

CFU /cm2 Transfer of C. difficile to clean surface

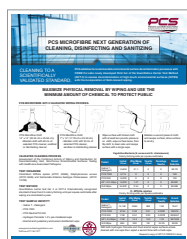
PFU /cm2 Transfer of Murine norovirus to clean surfaces

Transfer

0

0

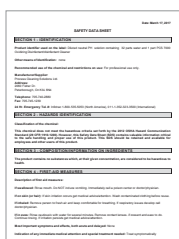
### REFERENCES & LINKS - CLICK THE LINKS BELOW TO DOWNLOAD EACH SUPPORTING DOCUMENT



PCS MICROFIBRE NEXT GENERATION OF CLEANING, DISINFECTING AND SANITIZING



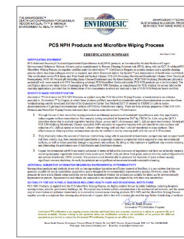
QCT-3 STUDIES



200 PPM SDS



QCT-3 - A PRELIMINARY FIELD-RELEVANT TEST TO ASSESS DECONTAMINATION OF HIGH-TOUCH ENVIRONMENTAL SURFACES: TESTING WITH STAPHYLOCOCCUS AUREUS



ENVIRODESIC CERTIFICATE- PCS NPH PRODUCTS AND MICROFIBRE WIPING PROCESS

# INTRODUCES NPH 250 DISINFECTANT NEUTRAL pH SODIUM HYPOCHLORITE SOLUTION ON DEMAND • HEALTHCARE



## Here's how it works.

PCS 250 and Neutralizer solution are each diluted with tap water through the NPH Dispenser. The two products combine to create NPH 250 Disinfectant.

NPH Patent pending dispenser.

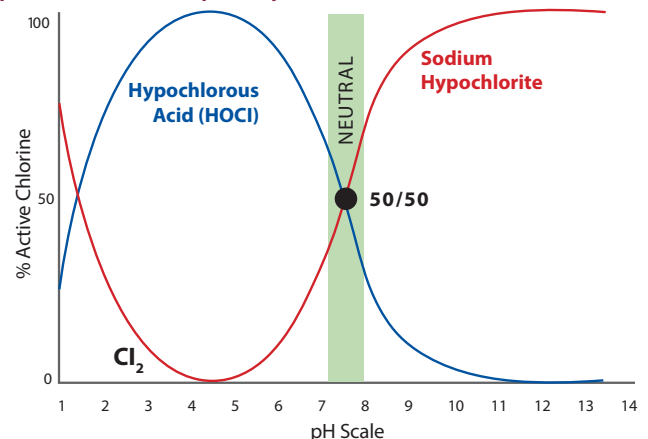
## USE QCT-3-9 Cleaning Process

- Cleans to a scientifically validated standard
- Process removes and prevents transferring Norovirus, bacteria and C.difficile spores to clean surfaces apply with pre moistened wipe or spray on surface and wipe dry with PCS microfibre cloth
- Clean health care facilities acute and long term care, schools, day care, homeless shelters animal shelters and in food service industry

## Benefits of Neutral pH Sodium Hypochlorite Solution (NPH)

- A low concentration of non-caustic, non-toxic, neutral pH, sodium hypochlorite solution
- Use to clean frequently touched surfaces
- Non-irritating to skin and eyes
- Non-sensitizing
- Low odour
- 60 - 90 day shelf life (once blended)
- Rapidly oxidizes organic soils
- Non-corrosive
- Certified by Envirodesic, for use in buildings housing chemically sensitive individuals
- Received top innovation of 2017 award from Infection Control Tips

**Sodium Hypochlorite Solution converts 50% of the Hypochlorite to Hypochlorous acid when pH is adjusted to neutral.**



PCS 250 CONCENTRATED  
OXIDIZING DISINFECTANT/  
DISINFECTANT CLEANER

PCS  
NEUTRALIZING  
SOLUTION



**NPH Dispenser**  
SKU #SP9200-NPH-D  
(Patent pending)



**NPH  
250  
Disinfectant**

**NPH Dispenser**  
SKU #SP9200-NPH-D  
(Patent pending)

**PCS Neutralizing  
Solution**  
SKU #6040-2  
3 year shelf life

**PCS 250  
Concentrated  
Oxidizing  
Disinfectant/  
Disinfectant Cleaner**  
SKU #5908NPC-2  
DIN 02472473  
3 year shelf life