

65402-1

2/28/2008

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

022808

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

Ms. LuAnn Maloney
Regulatory Manager for,
FMC Corporation
1735 Market Street
Philadelphia, PA 19103

Subject: VigorOx[®] Liquid Sanitizer & Disinfectant
EPA Registration Number 65402-1
Your Amendment Dated December 18th, 2007
EPA Received Date December 18th, 2007

The amendment referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, FIFRA, as amended, to revise the product labeling as per our letter of December 4th, 2007, is acceptable.

A stamped copy of the labeling is enclosed for your records.

If you have questions concerning this letter, please contact Karen M. Leavy at (703)-308-6237.

Sincerely,

A handwritten signature in cursive script that reads "M. Swindell".

Marshall Swindell
Product Manager 33
Regulatory Management Branch I
Antimicrobials Division (7510P)

2016

VigorOx® Liquid Sanitizer and Disinfectant

EPA Registration No. 65402-1
EPA Est. No. 00279-NY-003

**KEEP OUT OF REACH OF CHILDREN
DANGER**

VigorOx® Liquid Sanitizer and Disinfectant is for Institutional/Industrial sanitizing of previously cleaned non-porous food contact surfaces in:

- Dairies, Wineries, Breweries and Beverage Plants
- Meat and Poultry Processing/Packaging Plants
- Milk and Dairy Products Processing/Packing Plants
- Seafood and Produce Processing/Packing Plants
- Food Processing/Packing Plants
- Egg Processing/Packing Equipment Surfaces
- Eating Establishments

[See side panel for First Aid statements]

For Industrial Use Only

Active Ingredients:	Peroxyacetic Acid.....	5.1%
	Hydrogen Peroxide.....	21.7%
Inert Ingredients:	73.2%
Total	100.0%

VigorOx® Liquid Sanitizer and Disinfectant is for Institutional/Industrial sanitizing of previously-cleaned, hard, non-porous food-contact surfaces such as:

- Eating, Drinking, and Food Preparation Utensils
- Countertops and Food Preparation Surfaces
- Tableware
- Plastic, Glass and Metal Bottles (rinse)

For Organic Production. **VigorOx® Liquid Sanitizer and Disinfectant** may be used in rinse or wash water on products labeled as organic in food processing facilities on commodities that will be further processed. For use as a sanitizer on food contact surfaces in contact with products labeled as organic.

VigorOx® Liquid Sanitizer and Disinfectant is for sanitizing hard inanimate, non-food contact surfaces, (general environmental surfaces)

VigorOx® Liquid Sanitizer and Disinfectant is for use in the disinfection of hard, non-porous surfaces in general commercial and medical environments such as:

- Hospitals, Health Care Facilities, Veterinary Hospital/Clinics, Animal Life Science Labs, Pharmaceutical Facilities and Equipment
- Schools, Colleges, Recreational Facilities, Office Buildings
- Livestock Premises, Poultry Premises, Poultry Hatcheries, Animal Housing Facilities
- Retail and Wholesale Establishments
- Bathroom Premises

VigorOx® Liquid Sanitizer and Disinfectant is for use as a coarse spray for surfaces to be sanitized or disinfected.

VigorOx® Liquid Sanitizer and Disinfectant is for use in fogging applications as an adjunct to acceptable manual cleaning and disinfecting of room surfaces.

VigorOx® Liquid Sanitizer and Disinfectant can be used with the HRS™ and HRS™ II foaming agents. For food-contact applications, the foaming agent must be used in compliance with applicable regulations under the Federal Food, Drug and Cosmetic Act.

VigorOx® Liquid Sanitizer and Disinfectant can be used with the non-foaming agent, Paradigm™, as an antimicrobial container rinse and for hard, non-porous surface disinfection.

VigorOx® Liquid Sanitizer and Disinfectant is for use as an antimicrobial container rinse to control beverage spoilage microorganisms.

VigorOx® Liquid Sanitizer and Disinfectant is for use in the sanitization of ultra filtration and reverse osmosis (RO) membranes and their associated distribution systems.

Precautionary Statements Hazards to Humans and Domestic Animals

DANGER – Corrosive. Causes irreversible eye damage and skin burns Harmful if swallowed. May be fatal if absorbed through the skin. Do not get in eyes, on skin or on clothing. Wear protective eyewear (goggles, face shield or safety glasses), chemical resistant apron or coveralls and chemical resistant gloves. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco Remove contaminated clothing and wash before reuse.

Physical or Chemical Hazards – Strong oxidizing agent. Mix only with water. VigorOx™ Liquid Sanitizer and Disinfectant is not combustible but at temperatures exceeding 156°F, decomposition occurs releasing oxygen. The oxygen released could initiate or promote combustion of other materials.

Environmental Hazards – This pesticide is toxic to birds, mammals fish and aquatic life. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

**FMC Corporation
Peroxygens Division
1735 Market Street
Philadelphia, Pennsylvania 19103**

ACCEPTED
with COMMENTS
in EPA Letter Dated:

022808

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA No.

65402-1

3096

FMC and VigorOx® are trademarks of FMC Corporation



FIRST AID	
If in Eyes:	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on Skin or Clothing:	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If Inhaled:	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
If Swallowed:	<ul style="list-style-type: none"> • Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
<p>Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.</p> <p>This product is not to be used as a terminal sterilant/high-level disinfectant on any surface or instrument that (1) is introduced directly into the human body, either into or in contact with the bloodstream or normally sterile areas of the body, or (2) contacts intact mucous membranes but which does not ordinarily penetrate the blood barrier or otherwise enter normally sterile areas of the body. This product may be used to clean or decontaminate critical or semi-critical medical devices prior to sterilization or high-level disinfection.</p>	

Storage and Disposal

Storage
NEVER RETURN VigorOx® LIQUID SANITIZER AND DISINFECTANT TO THE ORIGINAL CONTAINER AFTER IT HAS BEEN REMOVED. Avoid all contaminants, especially dirt, caustic, reducing agents, and metals. Contamination and impurities will reduce shelf life and can induce decomposition. In case of a decomposition, isolate container, douse container with cool water and dilute with large volumes of water.

Avoid damage to containers. Keep container closed at all times when not in use. Keep container out of direct sunlight. To maintain product quality, store at temperatures below 86°F. Do not store on wooden pallets.

Procedure for Leak or Spill
 Stop leak if this can be done without risk. Shut off ignition sources; no flames, smoking, flares, or spark-producing tools. Keep combustible and organic materials away. Flush spilled material with large quantities of water. Undiluted material should not enter confined spaces.

Disposal
Pesticide Disposal
 If material has been spilled, an acceptable method of disposal is to dilute with at least 20 volumes of water followed by discharge into suitable treatment system in accordance with all local, state, and Federal environmental laws, rules, regulations, standards, and other requirements. Because acceptable methods of disposal may vary by location, regulatory agencies should be contacted prior to disposal.

VigorOx® Liquid Sanitizer and Disinfectant that is to be discarded should be disposed of as hazardous waste after contacting the appropriate local, state, or Federal agency to determine proper procedures.

Container Disposal
 Empty drums are not returnable to FMC unless special arrangements have been made. Triple rinse drums with water. Dispose of drums in accordance with local, state, and Federal regulations. **DO NOT REUSE.** Return 200 to 300 gallon totes to FMC or Service Company without rinsing. Do not rinse totes.

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Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

For use in circulation cleaning and institutional/industrial sanitizing of previously cleaned, hard, non-porous food-contact surfaces and equipment, such as food preparation surfaces, pipelines, tanks, vats, fillers, evaporators, pasteurizers and aseptic equipment in:

- Dairies, Wineries, Breweries and Beverage Plants
- Meat and Poultry Processing/Packaging Plants
- Milk and Dairy Products Processing/Packing Plants
- Seafood and Produce Processing/Packing Plants
- Food Processing/Packing Plants
- Egg Processing/Packing Equipment Surfaces
- Eating Establishments
- Final Sanitizing Bottle Rinse

Foam Sanitization

VigorOx[®] Liquid Sanitizer and Disinfectant can be applied as a foam for sanitization of previously cleaned, hard, non-porous food-contact surfaces and general environmental (non-food contact) hard, non-porous surfaces such as floors, walls, ceilings, drains and boots. Foam applications can be used where penetration and retention of product for required times is difficult to achieve. Examples include operating conveyor belts, and vertical or uneven surfaces.

1. Prepare a dilute VigorOx[®] Liquid Sanitizer and Disinfectant solution by adding 1 to 1.7 fluid ounces per 4.5 gallons potable water.
2. After preparing the VigorOx[®] Liquid Sanitizer and Disinfectant diluted solution, add 1 to 1.0 fluid ounces of HRS[™] or add 2 to 20 fluid ounces of HRS II per 4.5 gallons of diluted solution. After the HRS[™] or HRS[™] II is added, adjust the total solution volume to 5 gallons. HRS[™] and HRS[™] II are the only approved foam-generating additives for use with VigorOx[®] Liquid Sanitizer and Disinfectant.
3. Apply the sanitizing solution as a foam using commercially available foam generating equipment. Allow foam to contact surfaces at least one (1) minute.
4. Drain items and/or surfaces thoroughly.

Sanitizing Hard, Non-Porous Food Contact Surfaces

VigorOx[®] Liquid Sanitizer and Disinfectant is an effective sanitizer against *Staphylococcus aureus*, *Escherichia coli*, and *Salmonella typhimurium*.

Clean equipment Immediately after use:

1. Remove gross particulate matter with a warm water flush.
2. Wash equipment with detergent or cleaning solution.
3. Rinse equipment with potable water.
4. Prepare VigorOx[®] Liquid Sanitizer and Disinfectant solution by adding 1.0 to 1.7 fluid ounces to 5 gallons potable water. This provides 87.7 to 149 ppm peroxyacetic acid and 373 to 635 ppm hydrogen peroxide.
5. Fill closed systems with diluted sanitizer solution and allow a contact time of one (1) minute. If sanitizing at temperatures of 5°C (40°F) or lower, use 1.6 fluid ounces of product to 5 gallons of potable water.
6. If sanitizing against *Listeria monocytogenes*, use 1.2 to 1.7 fluid ounces of this product to 5 gallons of potable water. This will provide 105 to 149 ppm of peroxyacetic acid and 448 to 635 ppm of hydrogen peroxide.
7. For open or not completely closed systems, use a coarse spray, mop/wipe or flood technique to apply the solution to the surface and allow a contact time of one (1) minute.
8. Allow surfaces to drain thoroughly before resuming operation.

Eating Establishment Sanitizing

VigorOx[®] Liquid Sanitizer and Disinfectant is an effective sanitizer against *Staphylococcus aureus*, *Escherichia coli*, and *Salmonella typhimurium*.

1. Scrape/prewash plates, utensils, cups, glasses, etc. whenever possible.
2. Wash all items with a detergent.
3. Rinse thoroughly with potable water.
4. Prepare VigorOx[®] Liquid Sanitizer and Disinfectant solution by adding 1.0 to 1.7 fluid ounces of the product to 5 gallons of potable water. This will provide 87.7 to 149 ppm peroxyacetic acid and 373 to 635 ppm hydrogen peroxide.
5. Immerse all items for at least 2 minutes or for a contact time as specified by the local governing sanitizing code.
6. If sanitizing against *Listeria monocytogenes*, use 1.2 to 1.7 fluid ounces of this product to 5 gallons of potable water. This will provide 105 to 149 ppm of peroxyacetic acid and 448 to 635 ppm of hydrogen peroxide.
7. Place all sanitized items on a rack or drainboard to drain adequately. Air dry if items will not be reused immediately.

Sanitizing Tableware

For sanitizing tableware in low to ambient temperature warewashing machines, inject the diluted VigorOx[®] Liquid Sanitizer and Disinfectant solution (1.0 to 1.7 fluid ounces of the product to 5 gallons of potable water) into the final rinse water. Allow treated surfaces to air dry.

Final Sanitizing Bottle Rinse

VigorOx[®] Liquid Sanitizer and Disinfectant may be used as a final sanitizing rinse for plastic, glass or metal returnable and non-returnable bottles / cans.

1. Wash bottles with detergent or cleaning solution and rinse with potable water.
2. Rinse bottles/cans with a solution prepared by mixing 1.0 to 1.7 fluid ounces of VigorOx[®] Liquid Sanitizer and Disinfectant to 5 gallons of potable water.
3. Allow to drain adequately.

Sanitization of Hatching Eggs

1. Prepare a dilute solution by adding 1.0 to 1.7 fluid ounces of VigorOx[®] Liquid Sanitizer and Disinfectant to 5 gallons of potable water.
2. Apply dilute solution, as eggs are gathered or prior to setting, as a coarse spray or flood so as to lightly wet all egg shell surfaces.
3. Allow to drain dry.

Sanitization of Conveyors, Peelers, Slicers and Saws for Meat, Poultry, Seafood, Fruits, and Vegetables

VigorOx[®] Liquid Sanitizer and Disinfectant is an effective sanitizer against *Staphylococcus aureus*, *Escherichia coli*, and *Salmonella typhimurium*.

For use in the static or continuous washing, rinsing and sanitizing of conveyor equipment, peelers, collators, slicers saws etc.

1. Remove all products from equipment if during treatment the sanitizer will directly contact the items.
2. Prepare VigorOx[®] Liquid Sanitizer and Disinfectant solution by adding 1.0 to 1.7 fluid ounces to 5 gallons of potable water.
3. Apply sanitizer solution to the return portion of the conveyor or to the equipment using a coarse spray, foam or other means of wetting the surfaces. Treat for at least 1 minute. Control the volume of solution so as to permit maximum drainage and to prevent puddles. The conveyor still may be damp when food contact occurs.
4. If sanitizing against *Listeria monocytogenes*, use 1.2 to 1.7 fluid ounces of this product to 5 gallons of potable water.
5. Allow equipment to drain adequately before reusing; a dry surface is not required.

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Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 1-CUN-7

General Environmental Surfaces Sanitization (Non-Food Contact)

VigorOx® Liquid Sanitizer and Disinfectant is an effective inanimate, hard, non-food contact surface sanitizer against *Staphylococcus aureus*, *Klebsiella pneumoniae*, and *Saccharomyces cerevisiae*.

Sanitization of surfaces such as floors, walls, tables, chairs, benches, drains etc., can be accomplished using the following procedures:

1. Remove gross filth with a cleaner or other suitable detergent.
2. Add 1 to 11 fluid ounces of VigorOx® Liquid Sanitizer and Disinfectant to 16 gallons of potable water to prepare a solution containing 27 to 302 ppm of peroxyacetic acid and 117 to 1285 ppm of hydrogen peroxide.
3. Soak items in/with diluted solution using mop/wipe, coarse spray or flood techniques and allow contact for at least 5 minutes.
4. Allow items and/or surfaces to drain adequately or air dry.

Fogging

VigorOx® Liquid Sanitizer and Disinfectant is for sanitizing hard, non-porous room surfaces as an adjunct to acceptable manual cleaning and disinfection of room surfaces.

1. Prior to fogging, remove or carefully protect all food products and packaging materials.
2. Ensure room is properly ventilated. Vacate all personnel from the room during fogging and for a minimum of 2 hours after fogging. Ensure there is no strong odor characteristic of acetic acid before allowing personnel to return to the work area.
3. Fog areas using one quart per 1000 cu. ft. of room area with a 0.30% (3.8 fluid ounces per 10 gallons of water) VigorOx® Liquid Sanitizer and Disinfectant solution.
4. Allow surfaces to drain thoroughly before operations are resumed.

Surface Disinfection

VigorOx® Liquid Sanitizer and Disinfectant is an effective disinfectant against vegetative forms of Gram positive and Gram negative bacteria, and viruses. This product is effective against *Staphylococcus aureus*, *Salmonella enterica*, *Pseudomonas aeruginosa*, Influenza A Virus (H1N1, H3N2 and H5N1 strains), Influenza B Virus and Parainfluenza Virus Type 3. It may also be used to disinfect veterinary clinic surfaces and livestock equipment contaminated with Newcastle Disease virus, Avian Reovirus, Avian Infectious Bronchitis, Infectious Bursal Disease and Infectious Bovine Rhinotracheitis and may be used in general commercial and medical and veterinary environments to clean, disinfect, and deodorize hard, non-porous inanimate surfaces, including:

- Floors, walls, and other non-porous surfaces such as tables, chairs, counter tops, garbage cans/bins, bathroom fixtures, sinks, bed frames, shelves, racks, carts, refrigerators, coolers, glazed tile, linoleum, vinyl, glazed porcelain, plastic (such as polypropylene and polyethylene), stainless steel or glass.
- Hospitals, surgical and obstetrical suites, operating tables, housekeeping services, physical therapy departments, nursing homes, health care facilities, autopsy facilities, pharmaceutical and chemical processing facilities and equipment.
- Schools, colleges, industrial facilities, dietary areas, office buildings, recreational facilities, retail and wholesale establishments.
- Animal hospitals, veterinary clinics, animal life science laboratories, kennels, kennel runs, cages, feeding and watering equipment, pet shops, zoos, pet animal quarters, poultry premises, trucks, hatcheries and live stock quarters.

To disinfect surfaces that may be contaminated with Gram positive or Gram negative bacteria, including *S. aureus*, *S. choleraesuis* or *P. aeruginosa*:

1. Prepare VigorOx® Liquid Sanitizer and Disinfectant disinfecting solution by adding 3.2 to 30 oz. of the product to 5 gallons of potable water. This will provide 280 to 2630 ppm peroxyacetic acid and 1195 to 11,200 ppm hydrogen peroxide.
2. Remove gross filth from surfaces to be disinfected by cleaning with a detergent or suitable cleaning product. Rinse with clean water.
3. Apply VigorOx® Liquid Sanitizer and Disinfectant solution by wiping, mopping, foaming, or as a coarse spray. Allow to soak for at least 10 minutes, then air dry. (Applications on food-contact surfaces require a sterile or potable water rinse following disinfection).

For surfaces contaminated with the viruses listed above:

1. Prepare VigorOx® Liquid Sanitizer and Disinfectant solution by adding 2 3/4 fluid ounce to 5 gallons of potable water. This will provide 230 ppm peroxyacetic acid and 990 ppm hydrogen peroxide. This product is effective against viruses in up to 500 ppm hard water and on surfaces with moderate organic soil.
2. Remove gross filth from surfaces by cleaning with a detergent or suitable cleaning product. Rinse with clean water.
3. Apply VigorOx® Liquid Sanitizer and Disinfectant solution by wiping, mopping, or as a coarse spray. Allow to soak for at least 5 minutes then air dry.

VigorOx® Liquid Sanitizer and Disinfectant may be mixed with the non foaming agent, Peradigm™, prior to disinfection.

1. Prepare a diluted solution of VigorOx® Liquid Sanitizer and Disinfectant by adding a minimum of 2.8 fl. oz. to 4.5 gallons of water.
2. Add a maximum of 43 fl. oz. of Peradigm to the dilute solution, and bring total volume to 5 gallons.
3. Apply solution as previously described, allowing a minimum contact time of 10 minutes.

Antimicrobial Rinse of Pre-Cleaned or New Returnable or Non-Returnable Containers:

To reduce the number of nonpathogenic beverage spoilage organisms such as *Aspergillus versicolor*, *Byssoschlamys fulva*, *Pediococcus damnosus*, *Lactobacillus buchneri*, and *Saccharomyces cerevisiae*.

1. Prepare VigorOx® Liquid Sanitizer and Disinfectant by adding 7.0 to 30 fluid oz. to 5 gallons of potable water. This provides 614 to 2630 ppm peroxyacetic acid and 2614 to 11,200 ppm hydrogen peroxide.
2. Apply antimicrobial rinse at a temperature of 40 °C to 60 °C, and allow a minimum 5 second contact time.
3. Allow containers to drain thoroughly, and then rinse with sterile or potable water.

VigorOx® Liquid Sanitizer and Disinfectant may be mixed with the non foaming agent, Peradigm™, and applied at room temperature or at a minimum of 25 °C.

1. mix 1.5 fl. oz. VigorOx® Liquid Sanitizer and Disinfectant with Peradigm in 4.5 gallons of water.
2. Add a maximum of 43 fl. oz. of Peradigm to the dilute solution and bring total volume to 5 gallons. This provides 132 ppm peroxyacetic acid and 560 ppm hydrogen peroxide.
3. Apply solution, allowing a minimum contact time of 30 seconds.

Disinfection and Deodorizing of Animal Housing Facilities Poultry Premises, Coops, Trucks and Crates

1. Remove all animals / poultry from the facilities / items / areas to be disinfected.
2. Remove gross particulate, litter, droppings etc. with a warm water flush or by sweeping.
3. Empty all troughs, racks, and other feeding and watering equipment.
4. Wash all items thoroughly with detergent or cleaning solution and rinse with water.
5. Prepare a disinfecting solution by adding 3.2 fluid ounces of VigorOx™ Liquid Sanitizer and Disinfectant to 5 gallons of potable water. This provides 280 ppm of peroxyacetic acid and 1195 ppm of hydrogen peroxide which will disinfect surfaces contaminated with Gram positive and Gram negative bacteria, as well as poultry and cattle viruses listed above
6. Before starting the treatment ensure that the work area is well ventilated
7. For disinfection, saturate with the diluted product for a period of at least 10 minutes.
8. For surfaces contaminated with the viruses listed above under Surface Disinfection, saturate surfaces with diluted product for a period of at least 5 minutes.
9. Thoroughly scrub treated equipment (i.e., feed racks, troughs, fountains etc.) with detergent and rinse with potable water.
10. Do not return animals / poultry or use equipment until solution has been completely absorbed and air dried.

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Poultry Hatchery Disinfection

1. Remove remaining eggs and chicks, and all gross particulate and other hatching-related debris.
2. Thoroughly wash all surfaces with a recommended detergent or cleaning solution and then rinse with potable water.
3. Prepare the disinfecting solution by adding 3.2 fluid ounces of VigorOx® Liquid Sanitizer and Disinfectant to 5 gallons of potable water.
4. Before starting the treatment, ensure that the work area / room and any closed spaces are well ventilated.
5. Apply the disinfecting solution with a mop, cloth, brush or coarse spray, keeping surfaces wet for 10 minutes.
6. Air dry before re-introducing eggs.

Batch Sanitization of Ultra-Filtration and Reverse Osmosis (RO) Membranes

VigorOx® Liquid Sanitizer and Disinfectant is for use in the sanitization of ultra filtration, medical and non-medical institutional/industrial reverse osmosis (RO) membranes and their associated distribution systems. This product is not for use in kidney dialysis reprocessing equipment.

This product has been shown to be an effective disinfectant when tested by AOAC and EPA methods. This product may not totally eliminate all vegetative microorganisms in reverse osmosis membranes and their associated piping systems due to their construction and/or assembly, but can be relied upon to reduce the number of microorganisms to acceptable levels when used as directed. Check with equipment manufacturer for membrane compatibility with VigorOx® Liquid Sanitizer and Disinfectant.

1. Remove biological or organic fouling from the membrane or other parts of the system with an appropriate cleaner.
2. Flush the system with RO permeate or similar quality water.
3. Remove mineral deposits with an acidic cleaner prior to sanitizing the membranes.
4. Flush the system with RO permeate or similar quality water.
5. Prepare an appropriate volume of 1% solution of the product (12 fl. oz. per 10 gallons of water). This will provide 526 ppm of peroxyacetic acid and 2338 ppm hydrogen peroxide.
6. Fill the entire water circuit to be sanitized with the dilute solution and allow the solution to reach a minimum of 20°C (69°F).
7. Recirculate the dilute solution of VigorOx® Liquid Sanitizer and Disinfectant for a minimum of 10 minutes.
8. Allow membrane elements to soak in the solution for a minimum of 20 minutes.
9. Rinse the RO system and test for residuals to ensure that there is less than 3 ppm peroxygen. Residuals can be reduced by diverting product water to drain.

Batch Sanitization of Piping Systems Associated with RO Membranes

1. Isolate incompatible equipment from piping system. This includes activated carbon filters and ion exchange equipment. Turn off power to ultraviolet light units.
2. Estimate total volume of water contained in the system (tanks, rinse stations and piping). Prepare an appropriate volume of 1.0 to 1.5% VigorOx® Liquid Sanitizer and Disinfectant solution by adding 1.0 to 1.5 gallons of the product for every 100 gallons of solution prepared. Use RO permeate or similar quality water for dilution. This will provide 561 to 842 ppm peroxyacetic acid and 2389 to 3584 ppm hydrogen peroxide.
3. Recirculate the dilute VigorOx® Liquid Sanitizer and Disinfectant solution through the system for a minimum of 4 hours. Process usage valves should be opened and closed to expose internals to the VigorOx® Liquid Sanitizer and Disinfectant solution.
4. Completely drain the system of dilute VigorOx™ Liquid Sanitizer and Disinfectant solution. Thoroughly rinse the system by filling with RO permeate or similar quality water and recirculate before drainage. Repeat the process until test for residuals indicates there is less than 3 ppm peroxygen.

Continuous/Intermittent Addition to Minimize the Accumulation of Biological Matter Between Intermittent Sanitizing Episodes in Piping Systems Associated with RO Membranes.

1. VigorOx® Liquid Sanitizer and Disinfectant, as received or diluted may be added continuously to the feed water stream, between system sanitizing episodes, to aid in minimizing the regrowth/accumulation of biological matter. The peroxygen residual in the system that will be effective, will vary with the design and usage characteristics of the system. Adjust the addition rate of VigorOx® Liquid Sanitizer and Disinfectant or the solution and periodically monitor residual peroxygen so that the desired effect is obtained.
2. For continuous addition, do not exceed 20 ppm VigorOx® Liquid Sanitizer and Disinfectant (0.1 fl. oz. per 40 gallons of water). This will give 1 ppm peroxyacetic acid and 4.5 ppm hydrogen peroxide. For intermittent feed, do not exceed 2000 ppm VigorOx® Liquid Sanitizer and Disinfectant (10 fl. oz. per 40 gallons of water). This will give 123 ppm peroxyacetic acid and 523 ppm hydrogen peroxide.

Note: Before using VigorOx® Liquid Sanitizer and Disinfectant to sanitize metal surfaces, it is recommended that the diluted solution be tested on a small area to determine compatibility.

In all applications, always prepare a new sanitizing/disinfecting solution daily to ensure effectiveness. Do not reuse sanitizing/disinfecting solutions. Dispose of any unused sanitizing/disinfecting solution.

**For more information see Material Safety Data Sheet
Label Effective Date: 12/17/2007**

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