



U.S. ENVIRONMENTAL PROTECTION AGENCY  
Office of Pesticide Programs  
Antimicrobials Division (7510C)  
1200 Pennsylvania Avenue, NW  
Washington, D.C. 20004

EPA Reg. Number:

61495-4

Date of Issuance:

SEP 22 2005

Term of Issuance:

Conditional

Name of Pesticide Product:

Virocidin Plus

## NOTICE OF PESTICIDE:

☐ Reregistration  
☒ Registration

(under FIFRA, as amended)

Name and Address of Registrant (include ZIP Code):

KAM Scientific, Inc..  
4-1200 Waverley Street  
Winnipeg, Manitoba, Canada R3T0P4

Note: Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered/reregistered under the Federal Insecticide, Fungicide and Rodenticide Act.

Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is conditionally registered in accordance with FIFRA sec. 3(c)(7)(A) provided that you:

1. Submit and/or cite all data required for registration/reregistration of your product under FIFRA sec. 3(c)(5) when the Agency requires all registrants of similar products to submit such data; and submit acceptable responses required for reregistration of your product under FIFRA section 4.

2. Make the following label changes:

- a. Revise the EPA Registration Number to read, "EPA Reg. No. 61495-4."
- b. The percentage of "available chlorine" must be declared on the label below the ingredient statement.
- c. In the "First Aid" statement change "If on Skin" to read: "If on Skin or Clothing".

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Signature of Approving Official:

*Emily H. Mitchell*  
Emily H. Mitchell, Product Manager

Date:

SEP 22 2005

- d. Remove the following terms "Disinfectant, Sanitizer, Fungicide, and Algaecide" from the "First Aid" statement and place above the "Ingredient Statement".
- e. Correct the following typographical errors:
  - Under the "First Aid" statement after "If on Skin" change the word "Rise" to read "Rinse".
  - Under the "Precautionary Statements" change the word "Cause" to read "Causes".
  - Under the "Environmental Hazards" statement change the word "bee" to read: "been", "sewere" to read: "sewer" and "seqage" to read: "sewage".
  - Under the "Physical and Chemical Hazards" statement change the word "gasses" to read "gases".
  - Under the "Storage and Disposal" statement change the word "thoiroughly" to read: "thoroughly" and "aby" to read: "by".
- f. Revise the reentry level for swimming pools to read: Reentry is prohibited above levels of 4 ppm chlorine due to risk of bodily injury.
- g. Revise the reentry level for spas and hot tubs to read: Reentry is prohibited above levels of 5 ppm chlorine due to risk of bodily injury.
- h. You must place a "EPA Establishment Number" on your label. Please contact the Information Services Branch (John Jamula at (703) 305-6426.
- i. Under the "Directions for Use" change the following dosage rates:
  - **Swimming Pool Water Disinfection** - "64 to 128 oz." to read: "54 to 108 oz." and "12 oz." to read "13 oz."
  - **Spas, Hot-Tubs, Immersion Tanks, Etc.** - "7 oz." to read: "6 oz." and "10 oz." to read: "9 oz."  
Hubbard and Immersion Tanks - "7 oz." to read: "8 oz."
  - **Sanitization of Nonporous Food Contact Surfaces**  
Immersion Method - "2.5 oz." to read "3 oz."  
Flow/Pressure Method - "2.5 oz." to read: "3 oz."  
Clean-In-Place Method - "2.5 oz." to Read "3 oz."  
Spray/Fog Method - "8 oz," to read "9 oz."

- **Sanitizing of Porous Food Contact Surfaces**  
Rinse Method - "8 oz." to read "9 oz." and "2.5 oz." to read: "3 oz."  
Immersion Method - "8 oz." to read: "9 oz." and "2.5 oz." to read: "3 oz."  
Spray/Fog Method - "8 oz." to read: "9 oz." and "2.5 oz." to read: "3 oz."
- **Sanitization of Nonporous Non-Food Contact Surfaces**  
Rinse Method - "2.5 oz." to read "3 oz."  
Immersion Method - "2.5 oz." to read: "3 oz."  
Spray/Fog Method - "2.5 oz." to read "3 oz."
- **Disinfection of Nonporous Non-Food Contact Surfaces**  
Rinse Method - "8 oz." to read: "9 oz."  
Immersion Method - "8 oz." to read: "9 oz."
- **Sanitization of Porous Non-Food Contact Surfaces**  
Rinse Method - "8 oz." to read: "9 oz."  
Immersion Method - "8 oz." to read: "9 oz."  
Spray/Fog Method - "8 oz." to read: "9 oz."
- **Sewage and Wastewater Treatment**  
Effluent Slime Control - "13 to 128 oz." to read: "15 to 150 oz."
- **Public Water Systems**  
New Tanks, Basins, Etc. - "25 oz." to read: "30 oz."  
New Filter Sand - "100 oz." to read: "120 oz."  
New Wells - "7 oz." to read: 8 oz."  
Existing Equipment - "26 oz." to read: "32 oz." and "7 oz."  
to read: "8 oz."
- **Emergency Disinfection After Floods**  
Wells - "7 oz." to read: "8 oz."  
Basins, Tanks, Flumes, Etc. - "25 oz." to read "30 oz." and "7 oz."  
to read: "8 oz."  
Filters - "100 oz." to read: "120 oz."
- **Cooling Tower/Evaporative Condenser Water**  
Slug Feed Method - "64 to 128 oz." to read: "54 to 108 oz."  
Subsequent Dose - "13 oz." to read: 12 oz."  
Intermittent Feed Method - "64 to 128 oz." to read: "54 to 108 oz."  
Subsequent Dose - "13 oz." to read: 12 oz."  
Continuous Feed Method - "64 to 128 oz." to read: "54 to 108 oz."
- **Laundry Sanitizer**  
In Soaking Suds - "2.5 oz." to read: 3 oz."

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- **Commercial Laundry Sanitizer**  
"2.5 oz." to read: "3 oz."
- **Pulp and Paper Mill Process Water Systems**
  - Slug Feed Method - "64 to 128 oz." to read: "54 to 108 oz."
  - Subsequent Dose - "13 oz." to read "12 oz."
  - Intermittent Feed Method - "64 to 128 oz." to read: "54 to 108 oz."
  - Subsequent Dose - "13 oz." to read "12 oz."
  - Continuous Feed Method - "64 to 128 oz." to read "54 to 108 oz."
- **Food Egg Sanitization**  
"2.5 oz." to read "3 oz."
- **Fruit & Vegetable Washing**  
"7 oz." to read "8 oz."
- **Aquacultural Uses**
  - Fish Pond - "128 oz." to read "108 oz."
  - Maine Lobster Ponds - "7,700 oz." to read: "6,480 oz."
  - Fish Pond Equipment - "2.5 oz." to read "3 oz."
  - Conditioning Live Oysters - "7 oz." to read: "8 oz."
- **Sanitization of Dialysis Machines**  
"8 oz." to read: "9 oz."
- **Asphalt or Wood Roofs and Sidings**  
"7 oz." to read: "8 oz."
- **Boat Bottoms**  
"23 oz." to read "27 oz."
- **Artificial Sand Beaches**  
"7 oz." to read "8 oz."

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA sec. 6(e). Your release for shipment of the product constitutes acceptance of these conditions.

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

# VIROCIDIN PLUS

## (HYPOCHLORITE SOLUTION)

Active Ingredient – Sodium Hypochlorite.....10.5%  
Other Ingredients- .....89.5%  
100.0%

**KEEP OUT OF REACH OF CHILDREN**

**DANGER**

<b>FIRST AID</b>	
<b>DISINFECTANT, SANITIZER, FUNGICIDE, ALGAECIDE</b>	
<b>If In Eyes:</b>	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15 – 20 minutes.</li><li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If Inhaled</b>	<ul style="list-style-type: none"><li>• Move person to fresh air.</li><li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.</li><li>• Call a poison control center or doctor for further treatment advice.</li></ul>
<b>If On Skin</b>	<ul style="list-style-type: none"><li>• Take off contaminated clothing.</li><li>• Rise skin immediately with plenty of water for 15 – 20 minutes.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If Swallowed:</b>	<ul style="list-style-type: none"><li>• Have person sip a glass of water if able to swallow.</li><li>• Call a poison control center or doctor for treatment advice</li><li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li><li>• Do not give anything by mouth to an unconscious person.</li></ul>
<b>HOT LINE NUMBER</b>	
<b>DISINFECTANT, SANITIZER, FUNGICIDE, ALGAECIDE</b>	
Have the product container or label with you when you call a poison control center, or when going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.	
<b>Note to physician:</b> Probable mucosal damage may contraindicate the use of gastric lavage	

**SEE ADDITIONAL PRECAUTIONARY STATEMENTS ON SIDE PANEL**

Reg. No. 61495-XX  
Net Contents 1 L (or 4L)

EPA Est. No. XXXXX-XX-XXX

Manufactured for  
KAM Scientific, Inc.  
Winnipeg, Manitoba, Canada  
Made in Canada

ACCEPTED  
with COMMENTS  
EPA Letter Dated:

SEP 22 2005

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

61495-4

## PRECAUTIONARY STATEMENTS

### Hazards to humans and domestic animals

**DANGER:** Corrosive. Cause irreversible eye damage or skin burns. Harmful if swallowed, absorbed through skin or inhaled. Do not get in eyes, on skin, or on clothing. Avoid breathing spray mist. Wear goggles or face shield. Wear protective clothing and rubber gloves. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash clothing before reuse. Do not mix with chlorine-type bleaches or other chemicals.

### Environmental Hazards

This product is toxic to fish and aquatic organisms. Do not discharge effluent into lakes, streams, ponds, estuaries, oceans or public waters unless in accordance with the 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.

### Physical and Chemical Hazards

Strong oxidizer. Flush drains before and after use. Do not use or mix with other household chemicals, such as toilet bowl cleaners, rust removers, acid or ammonia containing products. To do so will release hazardous gases. Prolonged contact with metal may cause pitting or discoloration.

## STORAGE AND DISPOSAL

**Pesticide Storage:** Do not contaminate food or feed by storage, disposal or cleaning of equipment. Store in a cool, dry area away from direct sunlight and heat to avoid deterioration. In case of spill, flood area with large quantities of water.

**Pesticide Disposal:** Product or product rinsates that cannot be used should be diluted with water before disposal in a sanitary sewer.

**Container Disposal:** Rinse empty container thoroughly with water and either return to manufacturer or discard by placing this container in trash collection or burying in an approved landfill.

## DIRECTIONS FOR USE

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

**NOTE TO USER:** This product degrades with age. Use a chlorine test kit and increase dosage, as necessary, to obtain the required level of available chlorine.

### SWIMMING POOL WATER DISINFECTION

For a new pool or spring start-up, superchlorinate with 64 to 128 oz. of product for each 10,000 gallons of water to yield 5 to 10 ppm available chlorine by weight. Check the level of available chlorine with a test kit. Adjust and maintain pool water pH to between 7.2 to 7.6. Adjust and maintain the alkalinity of the pool to between 50 to 100 ppm.

To maintain the pool, add manually or by a feeder device 13 oz. of this product for each 10,000 gallons of water to yield an available chlorine residual between 0.6 to 1.0 ppm by weight. Stabilized pools should maintain a residual of 1.0 to 1.5 ppm available chlorine. Test the pH, available chlorine residual and alkalinity of the water frequently with appropriate test kits. Frequency of water treatment will depend upon temperature and number of swimmers.

Every 7 days, or as necessary, superchlorinate the pool with 64 to 128 oz. of product for each 10,000 gallons of water to yield 5 to 10 ppm available chlorine by weight. Check the level of available chlorine with a test kit. Do not reenter pool until the chlorine residual is between 1.0 to 3.0 ppm.

At the end of the swimming pool season or when water is to be drained from the pool, chlorine must be allowed to dissipate from treated pool water before discharge. Do not chlorinate the pool within 24 hours prior to discharge.

**WINTERIZING POOLS** - While water is still clear & clean, apply 4 oz. of product per 1000 gallons, while filter is running, to obtain a 3 ppm available chlorine residual, as determined by a suitable test kit. Cover pool, prepare heater, filter and heater components for winter by following manufacturers' instructions.

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### SPAS, HOT-TUBS, IMMERSION TANKS, ETC.

**SPAS/HOT-TUBS** - Apply 7 oz. of product per 1000 gallons of water to obtain a free available chlorine concentration of 5 ppm, as determined by a suitable chlorine test kit. Adjust and maintain pool water pH to between 7.2 and 7.8. Some oils, lotions, fragrances, cleaners, etc. may cause foaming or cloudy water as well as reduce the efficiency of the product.

To maintain the water, apply 7 oz. of product per 1000 gallons of water over the surface to maintain a chlorine concentration of 5 ppm.

After each use, shock treat with 10 oz. of this product per 500 gallons of water to control odor and algae.

During extended periods of disuse, add 4 oz. of product daily per 1000 gallons of water to maintain a 3 ppm chlorine concentration.

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HUBBARD AND IMMERSION TANKS – Add 7 oz. of this product per 200 gallons of water before patient use to obtain a chlorine residual of 25 ppm, as determined by a suitable test kit. Adjust and maintain the water pH to between 7.2 and 7.6. after each use drain the tank. Add 7 oz. To a bucket of water and circulate this solution through the agitator of the tank for 15 minutes and then rinse out the solution. Clean tank thoroughly and dry with clean cloths.

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HYDROTHERAPY TANKS - Add 1.5 oz. of this product per 1000 gallons of water to obtain a chlorine residual of 1 ppm, as determined by a suitable chlorine test kit. Pool should not be entered until the chlorine residual is below 3 ppm. Adjust and maintain the water pH to between 7.2 and 7.6. Operate pool filter continuously. Drain pool weekly, and clean before refilling.

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#### SANITIZATION OF NONPOROUS FOOD CONTACT SURFACES

RINSE METHOD - A solution of 100 ppm available chlorine may be used in the sanitizing solution if a chlorine test kit is available. Solutions containing an initial concentration of 100 ppm available chlorine must be tested and adjusted periodically to insure that the available chlorine does not drop below 50 ppm. Prepare a 100 ppm sanitizing solution by thoroughly mixing 1.5 oz. of this product with 10 gallons of water. If no test kit is available, prepare a sanitizing solution by thoroughly mixing 3 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight.

Clean equipment surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. If solution contains less than 50 ppm available chlorine, as determined by a suitable test kit, either discard the solution or add sufficient product to reestablish a 200 ppm residual. Do not rinse equipment with water after treatment and do not soak equipment overnight.

Sanitizers used in automated systems may be used for general cleaning but may not be re-used for sanitizing purposes.

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IMMERSION METHOD - A solution of 100 ppm available chlorine may be used in the sanitizing solution if a chlorine test kit is available. Solutions containing an initial concentration of 100 ppm available chlorine must be tested and adjusted periodically to ensure that the available chlorine does not drop below 50 ppm. Prepare a 100 ppm sanitizing solution by thoroughly mixing 1.5 oz. of this product with 10 gallons of water. If no test kit is available, prepare a sanitizing solution by thoroughly mixing 2.5 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight.

Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. if solution contains less than 50 ppm available chlorine, as determined by a suitable test kit, either discard the solution or add sufficient product to reestablish a 200 ppm residual. Do not rinse equipment with water after treatment.



Sanitizers used in automated systems may be used for general cleaning but may not be re-used for sanitizing purposes.

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**FLOW/PRESSURE METHOD** - Disassemble equipment and thoroughly clean after use. Assemble equipment in operating position prior to use. Prepare a volume of a 200 ppm available chlorine sanitizing solution equal to 110% of volume capacity of the equipment by mixing the product in a ratio of 2.5 oz. product with 10 gallons of water. Pump solution through the system until full flow is obtained at all extremities, the system is completely filled with the sanitizer and all air is removed from the system. Close drain valves and hold under pressure for at least 2 minutes to ensure contact with all internal surfaces. Remove some cleaning solution from drain valve and test with a chlorine test kit. Repeat entire cleaning/sanitizing process if effluent contains less than 50 ppm available chlorine.

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**CLEAN-IN-PLACE METHOD** - Thoroughly clean equipment after use. Prepare a volume of a 200 ppm available chlorine sanitizing solution equal to 110% of volume capacity of the equipment by mixing the product in a ratio of 2.5 oz. product with 10 gallons of water. Pump solution through the system until full flow is obtained at all extremities, the system is completely filled with the sanitizer and all air is removed from the system. Close drain valves and hold under pressure for at least 10 minutes to ensure contact with all internal surfaces. Remove some cleaning solution from drain valve and test with a chlorine test kit. Repeat entire cleaning/sanitizing process if effluent contains less than 50 ppm available chlorine.

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**SPRAY/FOG METHOD** - Preclean all surfaces after use. Use a 200 ppm available chlorine solution to control bacteria, mold or fungi and a 600 ppm solution to control bacteriophage. Prepare a 200 ppm sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 2.5 oz. product with 10 gallons of water. Prepare a 600 ppm solution by thoroughly mixing the product in a ratio of 8 oz. product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. Thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours. Prior to using equipment, rinse all surfaces treated with 600 ppm solution with a 200 ppm solution.

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## SANITIZING OF POROUS FOOD CONTACT SURFACES

**RINSE METHOD** - Prepare a sanitizing solution by thoroughly mixing 8 oz. of this product with 10 gallons of water to provide 600 ppm available chlorine by weight. Clean surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes and allow the sanitizer to drain. Prepare a 200 ppm sanitizing solution by thoroughly mixing 2.5 oz. of this product with 10 gallons of water and rinse all surfaces with this 200 ppm solution. Do not rinse with water and do not soak equipment overnight.

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**IMMERSION METHOD** - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 8 oz. of this product with 10 gallons of water to provide 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution, maintaining contact for at least 2 minutes and allow the sanitizes to drain. Following this, prepare a 200 ppm sanitizing solution by thoroughly mixing 2.5 oz. of this product with 10 gallons of water and rinse all surfaces with this 200 ppm solution. Do not rinse with water and do not soak equipment overnight.

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**SPRAY/FOG METHOD** - Preclean all surfaces after use. Prepare a 600 ppm available chlorine sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 8 oz. product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. Thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours. Prior to using equipment, rinse all surfaces with a 200 ppm available chlorine solution. Prepare a 200 ppm sanitizing solution by thoroughly mixing 2.5 oz. of this product with 10 gallons of water.

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#### SANITIZATION OF NONPOROUS NON-FOOD CONTACT SURFACES

**RINSE METHOD** - Prepare a sanitizing solution by thoroughly mixing 2.5 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight. Clean equipment surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

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**IMMERSION METHOD** - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 2.5 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

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**SPRAY/FOG METHOD** - Preclean all surfaces after use. Prepare a 200 ppm. available chlorine sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 2.5 oz. product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Prior to using equipment, thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours.

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#### DISINFECTION OF NONPOROUS NON-FOOD CONTACT SURFACES

**RINSE METHOD** - Prepare a disinfecting solution by thoroughly mixing 8 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean

equipment surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the disinfecting solution, maintaining contact with the solution for at least 10 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

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**IMMERSION METHOD** - Prepare a disinfecting solution by thoroughly mixing, in an immersion tank, 8 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the disinfecting solution for at least 10 minutes and allow the disinfectant to drain. Do not rinse equipment with water after treatment.

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### SANITIZATION OF POROUS NON-FOOD CONTACT SURFACES

**RINSE METHOD** - Prepare a sanitizing solution by thoroughly mixing 8 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

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**IMMERSION METHOD** - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 8 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

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**SPRAY/FOG METHOD** - After cleaning, sanitize non-food contact surfaces with 600 ppm available chlorine by thoroughly mixing the product in a ratio of 8 oz. of this product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. Prior to using equipment, thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours.

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### SEWAGE & WASTEWATER EFFLUENT TREATMENT

The disinfection of sewage effluent must be evaluated by determining the total number of coliform bacteria and/or fecal coliform bacteria, as determined by the Most Probable Number (MPN) procedure, of the chlorinated effluent has been reduced to or below the maximum permitted by the controlling regulatory jurisdiction.

On the average, satisfactory disinfection of secondary wastewater effluent can be obtained when the chlorine residual is 0.5 ppm after 15 minutes contact. Although the chlorine residual is the critical factor in disinfection, the importance of correlating chlorine residual with bacterial kill must be

emphasized. The MPN of the effluent, which is directly related to the water quality standards requirements, should be the final and primary standard and the chlorine residual should be considered an operating standard valid only to the extent verified by the coliform quality of the effluent.

The following are critical factors affecting wastewater disinfection.

1. Mixing: It is imperative that the product and the wastewater be instantaneously and completely flash mixed to assure reaction with every chemically active soluble and particulate component of the wastewater.
2. Contacting: Upon flash mixing, the flow through the system must be maintained.
3. Dosage/Residual Control: Successful disinfection is extremely dependant on response to fluctuating chlorine demand to maintain a predetermined, desirable chlorine level. Secondary effluent should contain 0.2 to 1.0 ppm chlorine residual after a 15 to 30 minute contact time. A reasonable average of residual chlorine is 0.5 ppm after 15 minutes contact time.

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## SEWAGE AND WASTEWATER TREATMENT

**EFFLUENT SLIME CONTROL** - Apply a 100 to 1000 ppm available chlorine solution at a location which will allow complete mixing. Prepare this solution by mixing 13 to 128 oz. of this product with 100 gallons of water. Once control is evident, apply a 15 ppm available chlorine solution. Prepare this solution by mixing 2 oz. of this product with 100 gallons of water.

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**FILTER BEDS -SLIME CONTROL:** Remove filter from service, drain to a depth of 1 ft. above filter sand, and add 120 oz. of product per 20 sq/ft evenly over the surface. Wait 30 minutes before draining water to a level that is even with the top of the filter. Wait for 4 to 6 hours before completely draining and backwashing filter.

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## DISINFECTION OF DRINKING WATER (EMERGENCY/PUBLIC/INDIVIDUAL/SYSTEMS)

**PUBLIC SYSTEMS** - Mix a ratio of 1.5 oz. of this product to 100 gallons of water. Begin feeding this solution with a hypochlorinator until a free available chlorine residual of at least 0.2 ppm and no more than 0.6 ppm is attained throughout the distribution system. Check water frequently with a chlorine test kit. Bacteriological sampling must be conducted at a frequency no less than that prescribed by the National Primary Drinking Water Regulations. Contact your local Health Department for further details.

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**INDIVIDUAL SYSTEMS: DUG WELLS** - Upon completion of the casing (lining), wash the interior of the casing (lining) with a 100 ppm available chlorine solution using a stiff brush. This solution can be made by thoroughly mixing 1.5 oz. of this product into 10 gallons of water. After covering the well, pour the sanitizing solution into the well through both the pipesleeve opening and the pipeline.

Wash the exterior of the pump cylinder also with the sanitizing solution. Start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Consult your local Health Department for further details.

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INDIVIDUAL WATER SYSTEMS: DRILLED, DRIVEN & BORED WELLS - Run pump until water is as free from turbidity as possible. Pour a 100 ppm available chlorine sanitizing solution into the well. This solution can be made by thoroughly mixing 1.5 oz. of this product into 10 gallons of water. Add 5 to 10 gallons of clean, chlorinated water to the well in order to force the sanitizer into the rock formation. Wash the exterior of the pump cylinder with the sanitizer. Drop pipeline into the well, start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours, flush well until all traces of chlorine have been removed from the water. Deep wells with high water levels may necessitate the use of special methods for introduction of the sanitizer to the well. Consult your local Health Department for further details.

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INDIVIDUAL WATER SYSTEMS: FLOWING ARTESIAN WELLS - Artesian Wells generally do not require disinfection. If analyses indicate persistent contamination, the well should be disinfected. Consult your local Health Department for further details.

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EMERGENCY DISINFECTION - When boiling of water for 1 minute is not practical, water can be made potable by using this product. Prior to addition of the sanitizer, remove all suspended material by filtration or by allowing it to settle to the bottom. Decant the clarified, contaminated water to a clean container and add 10 drop of this product to 20 gallons of water. Allow the treated water to stand for 30 minutes. Properly treated water should have a slight chlorine odor, if not, repeat dosage and allow the water to stand an additional 15 minutes. The treated water can then be made palatable by pouring it between clean containers for several times. This process has not been demonstrated to inactivate Cryptosporidium cysts.

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## PUBLIC WATER SYSTEMS

RESERVOIRS: ALGAE CONTROL - Hypo chlorinate streams feeding the reservoir. Suitable feeding points should be selected on each stream at least 50 yards upstream from the points of entry into the reservoir.

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MAINS - Thoroughly flush section to be sanitized by discharging from hydrants. Permit a water flow of at least 2.5 feet per minute to continue under pressure while injecting this product by means of a hypochlorinator. Stop water flow when a chlorine residual test of 50 ppm is obtained at the low pressure end of the new main section after a 24 hour retention time. When chlorination is completed, the system must be flushed free of all heavily chlorinated water.

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**NEW TANKS, BASINS, ETC.** - Remove all physical soil from surfaces. Place 25 oz. of this product for each 5 cubic feet of working capacity (500 ppm available chlorine). Fill to working capacity and allow to stand for at least 4 hours. Drain and flush with potable water and return to service.

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**NEW FILTER SAND** - Apply 100 oz. of this product for each 150 to 200 cubic feet of sand. The action of the product dissolving as the water passes through the bed will aid in sanitizing the new sand.

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**NEW WELLS** - Flush the casing with a 50 ppm available chlorine solution of water containing 7 oz. of this product for each 100 gallons of water. The solution should be pumped or fed by gravity into the well after thorough mixing with agitation. The well should stand for several hours or overnight under chlorination. It may then be pumped until a representative raw water sample is obtained. Bacterial examination of the water will indicate whether further treatment is necessary.

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**EXISTING EQUIPMENT**- Remove equipment from service, thoroughly clean surfaces of all physical soil. Sanitize by placing 26 oz. of this product for each 5 cubic feet capacity (approximately 500 ppm available chlorine). Fill to working capacity and let stand at least 4 hours. Drain and place in service. If the previous treatment is not practical, surfaces may be sprayed with a solution containing 7 oz. of this product for each 5 gallons of water (approximately 1000 ppm available chlorine). After drying, flush with water and return to service.

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**EMERGENCY DISINFECTION AFTER FLOODS**

**WELLS** -Thoroughly flush contaminated casing with a 500 ppm available chlorine solution. Prepare this solution by mixing 7 oz. of this product with 10 gallons of water. Backwash the well to increase yield and reduce turbidity, adding sufficient chlorinating solution to the backwash to produce a 10 ppm available chlorine residual, as determined by a chlorine test kit. After the turbidity has been reduced and the casing has been treated, add sufficient chlorinating solution to produce a 50 ppm available chlorine residual. Agitate the well water for several hours and take a representative water sample. Retreat well if water samples are biologically unacceptable.

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**RESERVOIRS** - In case of contamination by overflowing streams, establish hypochlorinating stations upstream of the reservoir. Chlorinate the inlet water until the entire reservoir obtains a 0.2 ppm available chlorine residual, as determined by a suitable chlorine test kit. In case of contamination from surface drainage, apply sufficient product directly to the reservoir to obtain a 0.2 ppm available chlorine residual in all parts of the reservoir.

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**BASINS, TANKS, FLUMES, ETC.** - Thoroughly clean all equipment, then apply 25 oz. of product per 5 cu. ft. of water to obtain 500 ppm available chlorine, as determined by a suitable test kit. After 24 hours, drain, flush, and return to service. If the previous method is not suitable, spray or flush the equipment with a solution containing 7 oz. of this product for each 5 gallons of water (1000 ppm available chlorine). Allow to stand for 2 to 4 hours, flush and return to service.

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**FILTERS** - When the sand filter needs replacement, apply 100 oz. of this product for each 150 to 200 cubic feet of sand. When the filter is severely contaminated, additional product should be distributed over the surface at the rate of 80 oz. per 20 sq. ft. Water should stand at a depth of 1 foot above the surface of the filter bed for 4 to 24 hours. When filter beds can be backwashed of mud and silt, apply 100 oz. of this product per each 50 sq. ft., allowing the water to stand at a depth of 1 foot above the filter and. After 30 minutes, drain water to the level of the filter. After 4 to 6 hours, drain, and proceed with normal backwashing.

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**DISTRIBUTION SYSTEM** - Flush repaired or replaced section with water. Establish a hypochlorinating station and apply sufficient product until a consistent available chlorine residual of at least 10 ppm remains after 24 hour retention time. Use a chlorine test kit.

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#### **EMERGENCY DISINFECTION AFTER FIRES**

**CROSS CONNECTIONS OF EMERGENCY CONNECTIONS** - Hypochlorination or gravity feed equipment should be set up near the intake of the untreated water supply. Apply sufficient product to give a chlorine residual of at least 0.1 to 0.2 ppm at the point where the untreated supply enters the regular distribution system. Use a chlorine test kit.

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#### **EMERGENCY DISINFECTION AFTER DROUGHTS**

**SUPPLEMENTARY WATER SUPPLIES** - Gravity or mechanical hypochlorite feeders should be set up on a supplementary line to dose the water to a minimum chlorine residual of 0.2 ppm after a 20 minute contact time. Use a chlorine test kit.

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**WATER SHIPPED IN BY TANKS, TANK CARS, TRUCKS, ETC.** - Thoroughly clean all containers and equipment. Spray a 500 ppm available chlorine solution and rinse with potable water after 5 minutes. This solution is made by mixing 7 oz. of this product for each 10 gallons of water. During the filling of the containers, dose with sufficient amounts of this product to provide at least a 0.2 ppm chlorine residual. Use a chlorine test kit.

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## EMERGENCY DISINFECTION AFTER MAIN BREAKS

**MAINS** - Before assembly of the repaired section, flush out mud and soil. Permit a water flow of at least 2.5 feet per minute to continue under pressure while injecting this product by means of a hypochlorinator. Stop water flow when a chlorine residual of test of 50 ppm is obtained at the low pressure end of the new main section after a 24 hour retention time. When chlorination is completed, the system must be flushed free of all heavily chlorinated water.

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## COOLING TOWER/EVAPORATIVE CONDENSER WATER

**SLUG FEED METHOD** - Initial Dose: When system is noticeably fouled, apply 64 to 128 oz. of this product per 10,000 gallons of water in the system to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved.

Subsequent Dose: When microbial control is evident, add 13 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

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**INTERMITTENT FEED METHOD** - Initial Dose: When system is noticeably fouled, apply 64 to 128 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown.

Subsequent Dose: When microbial control is evident, add 13 oz. of this product per 10,000 gallons of water in the system to obtain a 1 ppm residual. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown. Badly fouled systems must be cleaned before treatment is begun.

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**CONTINUOUS FEED METHOD** - Initial Dose: When system is noticeably fouled, apply 64 to 128 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine.

Subsequent Dose: Maintain this treatment level by starting a continuous feed of 1.5 oz. of this product per 1,000 gallons of water lost by blowdown to maintain a 1 ppm residual. Badly fouled systems must be cleaned before treatment is begun.

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## LAUNDRY SANITIZERS

### Household Laundry Sanitizers

**IN SOAKING SUDS** - Thoroughly mix 2.5 oz. of this product to 10 gallons of wash water to provide 200 ppm available chlorine. Wait 5 minutes, then add soap or detergent. Immerse laundry for at least 11 minutes prior to starting the wash/rinse cycle.

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**IN WASHING SUDS** - Thoroughly mix 2.5 oz. of this product to 10 gallons of wash water containing clothes to provide 200 ppm available chlorine. Wait 5 minutes, then add soap or detergent and start the wash/rinse cycle.

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### Commercial Laundry Sanitizers

Wet fabrics or clothes should be spun dry prior to sanitization. Thoroughly mix 2.5 oz. of this product with 10 gallons of water to yield 200 ppm available chlorine. Promptly after mixing the sanitizer, add the solution into the prewash prior to washing fabrics/clothes in the regular wash cycle with a good detergent. Test the level of available chlorine, if solution has been allowed to stand. Add more of this product if the available chlorine level has dropped below 200 ppm.

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## FARM PREMISES

Remove all animals, poultry, and feed from premises, vehicles, and enclosures. Remove all litter and manure from floors, walls and surfaces of barns, pens, stalls, chutes and other facilities occupied or transverse by animals or poultry. Empty all troughs, racks and other feeding and watering appliances. Thoroughly clean all surfaces with soap or detergent and rinse with water. To disinfect, saturate all surfaces with a solution of at least 1000 ppm available chlorine for a period of 10 minutes. A 1000 ppm solution can be made by thoroughly mixing 13 oz. of this product with 10 gallons of water. Immerse all halters, ropes, and other types of equipment used in handling and restraining animals or poultry, as well as the cleaned forks, shovels, and scrapers used for removing litter and manure. Ventilate buildings, cars, boats, and other closed spaces. Do not house livestock or poultry or employ equipment until chlorine has been dissipated. All treated feed racks, mangers, troughs, automatic feeders, fountains, and waterers must be rinsed with potable water before reuse.

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## PULP AND PAPER MILL PROCESS WATER SYSTEMS

**SLUG FEED METHOD** - Initial Dose: When system is noticeably fouled, apply 64 to 128 oz. of this product per 10,000 gallons of water in the system to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved.

Subsequent Dose: When microbial control is evident, add 13 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

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**INTERMITTENT FEED METHOD** - Initial Dose: When system is noticeably fouled, apply 64 to 128 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown.

Subsequent Dose: When microbial control is evident, add 13 oz. of this product per 10,000 gallons of water in the system to obtain a 1 ppm residual. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown. Badly fouled systems must be cleaned before treatment is begun.

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**CONTINUOUS FEED METHOD** - Initial Dose: When system is noticeably fouled, apply 64 to 128 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine.

Subsequent Dose: Maintain this treatment level by starting a continuous feed of 1.5 oz. of this product per 1,000 gallons of water lost by blowdown to maintain a 1 ppm residual. Badly fouled systems must be cleaned before treatment is begun.

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## AGRICULTURAL USES

**POST-HARVEST PROTECTION** - Potatoes can be sanitized after cleaning and prior to storage by spraying with a sanitizing solution at a level of 1 gallon of sanitizing solution per ton of potatoes. Thoroughly mix 1.5 oz. of this product to 2 gallons of water to obtain 500 ppm available chlorine.

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Disinfect leafcutting bee cells and bee boards by immersion in a solution containing 1 ppm available chlorine for 3 minutes. Allow cells to drain for 2 minutes and dry for 4 to 5 hours or until no chlorine odor can be detected. This solution is made by thoroughly mixing 1 tsp. of this product to 100 gallons of water. The bee domicile is disinfected by spraying with a 0.1 ppm solution until all surfaces are thoroughly wet. Allow the domicile to dry until all chlorine odor has dissipated.

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**FOOD EGG SANITIZATION** - Thoroughly clean all eggs. Thoroughly mix 2.5 oz. of this product with 10 gallons of warm water to produce a 200 ppm available chlorine solution. The sanitizer temperature should not exceed 130 degrees F. Spray the warm sanitizer so that the eggs are thoroughly wetted. Allow the eggs to thoroughly dry before casing or breaking. Do not apply a potable water rinse. The solution should not be re-used to sanitize eggs.

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**FRUIT & VEGETABLE WASHING** - Thoroughly clean all fruits and vegetables in a wash tank. Thoroughly mix 7 oz. of this product in 200 gallons of water to make a sanitizing solution of 25 ppm available chlorine. After draining the tank, submerge fruit or vegetables for 2 minutes in a second wash tank containing the recirculating sanitizing solution. Spray rinse vegetables with the sanitizing solution prior to packaging. Rinse fruit with potable water only prior to packaging.

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#### AQUACULTURAL USES

**FISH PONDS** - Remove fish from ponds prior to treatment. Thoroughly mix 128 oz. of this product to 10,000 gallons of water to obtain 10 ppm available chlorine. Add more product to the water if the available chlorine level is below 1 ppm after 5 minutes. Return fish to pond after the available chlorine level reaches zero.

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**FISH POND EQUIPMENT** - Thoroughly clean all equipment prior to treatment. Thoroughly mix 2.5 oz. of this product to 10 gallons of water to obtain 200 ppm available chlorine. Porous equipment should soak for one hour.

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**MAINE LOBSTER PONDS** - Remove lobsters, seaweed, etc. from ponds prior to treatment. Drain the pond. Thoroughly mix 7,700 oz. of this product to 10,000 gallons of water to obtain at least 600 ppm available chlorine. Apply so that all barrows, gates, rocks and dams are treated with product. Permit high tide to fill the pond and then close the gates. Allow water to stand for 2 to 3 days until the available chlorine level reaches zero. Open and allow 2 tidal cycles to flush the pond before returning lobsters to the pond.

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**CONDITIONING LIVE OYSTERS** - Thoroughly mix 7 oz. of this product to 10,000 gallons of water at 50 to 70 degrees F to obtain 0.5 ppm available chlorine. Expose oysters to this solution for at least 15 minutes, monitoring the available chlorine level so that it does not fall below 0.05 ppm. Repeat entire process if the available chlorine level drops below 0.05 ppm or the temperature falls below 50 degrees F.

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**CONTROL OF SCAVENGERS IN FISH HATCHERY PONDS** - Prepare a solution containing 200 ppm of available chlorine by mixing 2.5 oz. of product with 10 gallons of water. Pour into drained pond potholes. Repeat if necessary. Do not put desirable fish back into refilled ponds until chlorine residual has dropped to 0 ppm, as determined by a test kit.

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#### SANITIZATION OF DIALYSIS MACHINES

Flush equipment thoroughly with water prior to using this product. Thoroughly mix 8 oz. of this product to 10 gallons of water to obtain at least 600 ppm available chlorine. Immediately use this product in the

hemodialysate system allowing for a minimum contact time of 15 minutes at 20 degrees C. Drain system of the sanitizing solution and thoroughly rinse with water. Discard and DO NOT reuse the spent sanitizer. Rinsate must be monitored with a suitable test kit to ensure that no available chlorine remains in the system.

This product is recommended for decontaminating single and multipatient hemodialysate systems. This product has been shown to be an effective disinfectant (\*virucide, fungicide, bactericide, pseudomonicide) when tested by AOAC and EPA test methods. This product may not totally eliminate all vegetative microorganisms in hemodialysate delivery 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. This product should be used in a disinfectant program which includes bacteriological monitoring of the hemodialysate delivery system. This product is NOT recommended for use in hemodialysate or reverse osmosis (RO) membranes. Consult the guidelines for hemodialysate systems which are available from the Hepatitis Laboratories, CDC, Phoenix, AZ 85021.

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#### ASPHALT OR WOOD ROOFS AND SIDINGS

To control fungus and mildew, first remove all physical soil by brushing and hosing with clean water, and apply a 5000 ppm available chlorine solution. Mix 7 oz. of this product per gallon of water and brush or spray roof or siding. After 30 minutes, rinse by hosing with clean water.

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#### BOAT BOTTOMS

To control slime on boat bottoms, sling a plastic tarp under boat, retaining enough water to cover the fouled bottom area, but not allowing water to enter enclosed area. This envelope should contain approximately 500 gallons of water for a 14 foot boat. Add 23 oz. of this product to this water to obtain a 35 ppm available chlorine concentration. Leave immersed for 8 to 12 hours. Repeat if necessary. Do not discharge the solution until the free chlorine level has dropped to 0 ppm, as determined by a swimming pool test kit.

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#### ARTIFICIAL SAND BEACHES

To sanitize the sand, spray a 500 ppm available chlorine solution containing 7 oz. of this product per 10 gal. of water at frequent intervals. Small areas can be sprinkled with a watering can.

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#### WARE WASHING

FOR SANITIZING TABLEWARE IN LOW TEMPERATURE DISHWASHING MACHINE - Dispense Commercial Chlor into final rinse water at 100 ppm available chlorine. Do not allow concentration to fall below 50 ppm. Air dry. Dispenser should be set to deliver 4cc of sanitizing solution per gallon of water to give 100 ppm of available chlorine. Only a qualified service representative should set or adjust dispenser on the machine.