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

EPA United States Environmental Protection Agency **Office of Pesticide Programs**

AUG 21 2009

Cristina Griffin
Agent for Olin Corporation
c/o Delta Analytical Corp.
12510 Prosperity Drive, Suite 160
Silver Spring, MD 20904

Subject: Olin Chlorine
EPA Registration No. 72315-1
Application Date: July 6, 2009
Receipt Date: July 7, 2009

Dear Ms. Griffin:

The following amendment, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, is acceptable with the following condition:

Proposed Amendment

- Revise Storage and Disposal Statement per PR-Notice 2007-4
- Add the following uses consistent with EPA Reg. No. 37982-2 and the Chlorine Gas Registration Eligibility Document (RED)

    1. Bacteria, Algae, slime build-up and clogging in irrigation systems
    2. Sanitizing hard non-porous food contact surfaces
    3. Fruit and vegetable wash

- Add the use "macrofoulant control agent for industrial water systems", consistent with EPA Reg. No. 72315-6
- Add chlorine dosage tables
- Add chlorinator instruction booklet

Condition

The proposed use, "macrofoulant control agent for industrial water systems", as well as all references to it, must be deleted from the label. According to the Red for Chlorine Gas, this could be considered a new use for this active ingredient, and may be subject to PRIA process and fees.

General Comments

A stamped copy of the labeling accepted with conditions is enclosed. Submit one (1) copy of your final printed label before distributing or selling the product bearing the revised labeling.

Should you have any questions concerning this letter, please contact Wanda Henson at (703) 308-6345.

Sincerely,

for

Emily H. Mitchell
Product Manager (32)
Regulatory Management Branch II
Antimicrobials Division (7510P)

Olin

CHLORINE

LIQUIFIED GAS UNDER PRESSURE

NONFLAMMABLE

FOR USE AS A DISINFECTANT AND/OR ALGICIDE, by experienced personnel only, in municipal water supplies, sewage and waste management plants, and in commercial and industrial swimming pools; as a slimicide in water cooling systems and in paper mills; for bacteria, algae, slime build-up and clogging in irrigation systems; for sanitizing non porous and porous food contact surfaces; for treating fruit and vegetables; as a macrofoulant control agent for industrial water; and in repackaging into portable cylinders. Re-packagers must obtain their own registration with Environmental Protection Agency.

CAS No. 7782-50-5

ACTIVE INGREDIENT:	
Chlorine	99.5%
OTHER INGREDIENTS:	0.5%
TOTAL	100.0%

EPA Reg. No. 72315-1

EPA Est. Nos. : 72315-AL-001, 72315-GA-001, 72315-NY-001, 72315-TN-001, 71207-CAN-002 61667-CA-001, 61667-CA-002, 61667-LA-001, 61667-NV-001, 61667-WA-001, 61667-WA-002

See Bill of Lading for specific establishment number

ACCEPTED
with COMMENTS
In EPA Letter Dated:
AUG 21 2009

KEEP OUT OF REACH OF CHILDREN

DANGER  **POISON**

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide, registered under EPA Reg. No. 72315-1

FIRST AID	
If inhaled	• 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 on skin or clothing	• 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 in eyes	• 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 swallowed	• 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 the poison control center or doctor. • Do not give anything by mouth to an unconscious person.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

NOTE TO PHYSICIAN

Probable mucosal damage may contraindicate the use of gastric lavage.

OCEAN® NETWORK EMERGENCY PHONE

1-888-289-1911

Olin
CHLOR ALKALI
PRODUCTS

OLIN CHLOR ALKALI PRODUCTS, 490 Stuart Road N.E., Cleveland, TN 37312

Net Wt: [See Bill of Lading]

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS & DOMESTIC ANIMALS

DANGER. Corrosive. Causes irreversible eye damage and skin burns. Fatal if swallowed, inhaled, or absorbed through skin. Do not get in eyes, on skin, or on clothing. Do not breathe vapor. Wear goggles, protective clothing and rubber gloves as discussed below. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco. Remove contaminated clothing and wash before reuse.

PERSONAL PROTECTIVE EQUIPMENT: Handlers must wear long-sleeved shirts, long pants, shoes, and socks. **In Case Of Spill Or Leakage:** Under normal use-conditions, no protective eyewear, respirator, or gloves are required. However, in case of a spill or leak, handlers must wear chemical–resistant gloves (such as nitrile of butyl) and a full-face canister-style (gas mask) respirator with a canister approved for chlorine (MSHA/NIOSH approval number prefix TC-14G) OR a self contained breathing apparatus (SCBA) (MSHA/NIOSH approval number prefix TC-13F). Since there is always the possibility of a spill or leak, gloves and a respirator of a type specified above must be available and are required for anyone entering into an affected area in the event of a leak or spill.

ENVIRONMENTAL HAZARDS: This pesticide is toxic to fish. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other 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 the regional office of the Environmental Protection Agency.

CHEMICAL-PHYSICAL HAZARDS: Chlorine is a nonflammable gas, liquified, under pressure. Do not drop container. Keep away from intense heat or open sunlight. Corrosive to most metals in the presence of moisture.

LEAK PROCEDURE: Evacuate and isolate the area. Wear full protective clothing and self-contained breathing apparatus approved by NIOSH. Follow OSHA regulations for respirator use (Sec. 29 CFR1910.134). Wash contaminated clothes before reuse. If possible, stop flow of gas. Remove to open area.

STORAGE & DISPOSAL: For Bulk Shipments: Keep containers away from direct exposure to fire. All containers are to be kept in a secure location and must not be accessible to the general public. Empty containers should be properly identified with return tags and returned to the supplier according to prescribed instruction and practices recommended by the Chlorine Institute and per all applicable DOT, FRA and USCG regulations. **For Cylinders or Ton Containers:** Keep containers away from heat. Do not store in direct sunlight or drop portable containers. All containers are to be kept in a secure location and must not be accessible to the general public Empty containers should be properly identified with return tags and returned to supplier according to prescribed instruction and practices recommended by the Chlorine Institute and per all applicable DOT, FRA and USCG regulations..

DIRECTIONS FOR USE
GENERAL CLASSIFICATION

It is a violation of federal law to use this product in a manner inconsistent with the labeling. Have available gas masks approved by the National Institute for Occupational Safety and Health. Handle and use only in accordance with practices recommended in the Chlorine Manual published by the Chlorine Institute, Inc., Virginia. Use only in well ventilated areas.

Only specifically designed dispensing equipment should be used in accordance with manufacturer's instructions and according to state regulatory agency recommendations for dosages or residual chlorine levels which should be maintained for each specific site of application. FOR USE AS A DISINFECTANT AND/OR ALGICIDE, by experienced personnel only, in municipal water supplies, sewage and waste management plants, and in commercial and industrial swimming pools; as a slimicide in water cooling systems and in paper mills and in repackaging into portable cylinders. The "Booklet – Additional Use Instructions" includes specific directions for use of this product for bacteria, algae, slime build-up and clogging in irrigation systems; for sanitizing non porous and porous food contact surfaces; for treating fruit and vegetables; and as a macrofoulant control agent for industrial water. Re-packagers must obtain their own registration with Environmental Protection Agency.

CLEANING FORMULATIONS, BLEACHING, & NON-PESTICIDE CHEMICAL MANUFACTURING: This product may be used for cleaning formulations, bleaching and non-pesticide chemical manufacturing. Only specifically designed handling and dispensing equipment should be used in accordance with manufacturer's instructions and according to operating instructions or product formulations defined by the use facility.

NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR OTHERWISE ARE MADE OR CONTAINED HEREIN, EXCEPT THAT PRODUCT CONFORMS TO OLIN'S SPECIFICATIONS THEREFORE, Olin's exclusive responsibility for any claims, including claims based on negligence, arising in connection with the purchase, use, storage or handling of the product will in no event exceed Olin's sales price for the product with respect to which damages are claimed. In no event will Olin be liable for any incidental or consequential damages arising in connection with the purchase, use, storage or handling of the product. Buyer accepts full responsibility for compliance with all applicable Federal, state and local laws and regulations. ESLMMDDYY

AUG 21 2009

72315-1

Olin

ACCEPTED
with COMMENTS
EPA Letter Dated:
1 2009
Under the Federal Insecticide, Fungicide and Rodenticide Act as amended for the pesticide, registered under EPA Reg. No. 72315-1

CHLORINE

Liquified Gas Under Pressure

Booklet -- Additional Use Instructions
See Label for additional information

AGRICULTURAL USES

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Workers Protection Standard.

The Restricted-Entry Interval (REI) is 0 days when using this product.

There are no posting or notification requirements when using this product.

Personal Protective Equipment should be worn as described under the "Precautionary Statements" section of this label.

BACTERIA, ALGAE, SLIME BUILD-UP AND CLOGGING IN IRRIGATION SYSTEMS

This product is to be applied through drip/trickle sprinkler irrigation systems only for agricultural crops and only where this manner of use will not cause crop damage. As packaged, chlorine gas has 99.5% or higher chlorine content. While using chlorine gas is generally considered the least expensive method of applying chlorine, it is also hazardous if used without following the direction of trained or qualified service personnel.

Irrigators wishing to apply chlorine gas should use suitably designed vacuum injector equipment (Venturi ejector device) rated for chlorine. Do not attempt to use ejectors designed for other purposes (such as fertigation) because crop injury, hazardous equipment failure and/or lack of product effectiveness can result. Questions regarding equipment use and calibration should be directed to chlorine suppliers or other experts such as your state or local Agriculture Research Center.

DO NOT connect any irrigation system, including greenhouse systems into which chlorine is to be added, to a public water system unless safety devices prescribed by the state Department of Health, Safe Drinking Water Branch, for cross connection protection are in place.

A certified applicator or someone under the direct supervision of a certified applicator shall start up, shut down, and make necessary adjustments to the system as needed to maintain proper performance of the chlorine application and compliance with this label.

CALIBRATION - If the irrigation water has high levels of nutrients causing bacterial, algae, or other bio-fouling that reduces system performance, continuous chlorination may be necessary. The recommended level of free residual chlorine for continuous feed is 1 to 2 ppm, measured at the end of the farthest lateral using a good quality test kit for free chlorine (also called "free residual" or "free available" chlorine).

Periodic shock treatments at a higher chlorine rate of up to 20 ppm free residual may be appropriate where bacteria and/or algae clogging and build-up are not managed by maintaining a continuous residual. The frequency of the chlorine shock

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application depends upon the frequency and extent of bio-clogging.
Superchlorination, bringing chlorine concentrations to as much as 100 ppm total chlorine, is recommended for reclaiming low-volume irrigation systems if clogged by algae and bacterial slimes. Set the chlorinator to deliver 100 ppm in the drip system and monitor the free chlorine residual at the end of the farthest lateral. As soon as it is established that the free residual reading is between 10 and 20 ppm, shut the system down and leave it undisturbed for up to 24 hours. Then flush all sub-mains and laterals with fresh water. Superchlorination will not dissolve or remove scale or inorganic sediment fouling.

The chlorine gas application rate can be determined from the following formula:

Chlorine Gas Injection Rate in lbs./day	=	System Flow Rate in gpm	X	Desired Chlorine Concentration in ppm	X	0.012

Example:
How much chlorine will be required daily to obtain 2 ppm available chlorine with a water flow rate of 1500 gallons per minute?

Chlorine Gas Injection Rate in lbs./day = 1500 gpm X 2.0 ppm X 0.012

Chlorine Gas Injection Rate = 36 lbs./day

NOTE: This calculation, when applied to clean water which is free of amine nitrogen and organic nutrients, will give a result close to the actual chlorine gas dose setting required. In this case, the chlorine gas dose rate (in ppm) approximately equals the desired free chlorine concentration (in ppm). In actual practice, however, contaminants in the water may consume chlorine such that the desired free chlorine concentration is less than the chlorine gas dose rate as calculated above. To correctly establish the chlorine gas dose setting required, it is necessary to measure the free chlorine concentration (ppm) at the end of the treated increment in the field and adjust the chlorine gas dose setting until the desired free chlorine concentration is obtained. Only experience can establish the actual chlorinator settings required to provide the amount of free chlorine at the end of the farthest lateral (and consequent treatment of the irrigation system).

Chlorination should be started during irrigation, near the end of the irrigation sequence, but early enough to establish the desired free chlorine concentration throughout the system being treated. Apply the chlorine upstream of the filter to help keep the filter clean. Determine the level of free chlorine as described in the "Calibration" section, above, using a free chlorine test kit. Allow sufficient time to achieve a steady reading.

DO NOT apply chlorine when fertilizers, herbicides, and insecticides are being injected since they will consume the chlorine and may produce toxic reaction products.

Shut down the chlorine feed as soon as the irrigation water is switched to the next irrigation sector. Leave the treated water residing in the section which has been shut down.

If its source water is connected to a potable water system, the irrigation water system must contain a functional reduced-pressure-principle back-flow prevention device approved by your state Department of Health, appropriately situated to prevent contamination of the potable water system. This device must be certified operational by an agent authorized for making certifications by the state Department of Health.

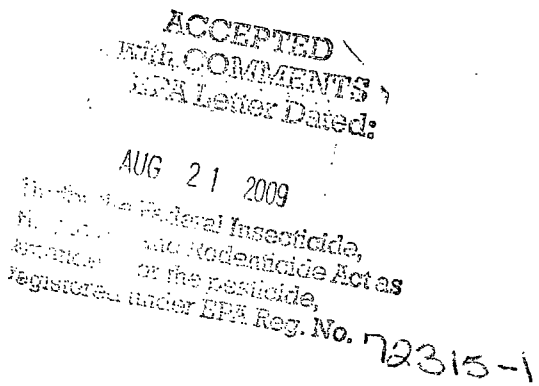
The chlorine vacuum ejector must contain a functional, integral check valve to prevent the flow of water into the chlorine line, toward the chlorine regulator. The chlorine vacuum line may also contain an optional chlorine-rated, normally-closed solenoid valve connected to a system power interlock and/or a secondary vacuum check valve for additional protection of the chlorine regulator.

SENSITIVE PLANT SPECIES - Certain plants, including various species of trees, flowers, shrubs, agronomic crops, fruits and vegetables are adversely affected by chlorinated irrigation. The use of this product can impact the growth, appearance and health of the plants.

Applications of chlorine in irrigation systems must be done by a certified applicator and, if necessary, on a trial basis until sufficient experience relative to sensitive plants, including crops and their specific varieties, is gained.

Begonias, geraniums and other ornamental plant species are known to be sensitive to continuous chlorination at levels of 1-2 ppm free chlorine. Plant species such as tomato, lettuce, broccoli, and petunia are sensitive to periodic chlorination levels of 10-20 ppm free chlorine.

If uncertain of a plant's tolerance, consult an agronomist or a support agency such as your local University Extension Service or use an alternate method to remove bio-fouling from the irrigation system.



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NON AGRICULTURAL USES

SANITIZING HARD NON POROUS FOOD CONTACT SURFACES

Fresh sanitizer solution should be prepared daily or more frequently if the solution becomes diluted or soiled. Sanitizers used in automated systems may be used for general cleaning but may not be re-used for sanitizing purposes.

RINSE METHOD - A solution of 100 ppm available chlorine may be used in the sanitizing solution. 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. Check the concentration of available chlorine using a chlorine test kit.

Clean equipment surfaces in the normal manner. Remove all soils and food particles by flushing, scraping and/or pre-soaking. Wash thoroughly with a good detergent followed by a potable water rinse. 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 re-establish a 100 ppm residual. Do not rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - A solution of 100 ppm available chlorine may be used as the sanitizing solution. 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. Check the concentration of available chlorine using a chlorine test kit.

Clean equipment surfaces 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 re-establish a 100 ppm residual. Do not rinse equipment with water after treatment.

SANITIZING POROUS FOOD CONTACT SURFACES

RINSE METHOD – A solution of 600 ppm available chlorine may be used to sanitize porous food contact surfaces (i.e., wood chopping blocks). Clean surfaces in the normal manner. Rinse all surface thoroughly with the 600 ppm solution, maintaining contact with the sanitizer for at least 2 minutes. Prepare a 200 ppm sanitizing solution. Prior to using equipment, rinse all surfaces with a 200 ppm available chlorine solution. Do not rinse and do not soak equipment overnight.

IMMERSION METHOD - Prepare a 600 ppm available chlorine solution. Clean equipment in the normal manner. Immerse equipment in the 600 ppm sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Prepare a 200 ppm sanitizing solution. Prior to using equipment, immerse all surfaces in a 200 ppm available chlorine solution. Do not rinse and do not soak equipment overnight.

FRUIT & VEGETABLE WASHING - All fruits and vegetables should be cleaned by thoroughly washing in an appropriate cleaning solution. Remove all soils and other residues prior to treating with this product. After washing, transfer the fruit and vegetables to a separate tank containing the solution.

Apply this product at the recommended concentration of available chlorine. See the following table for recommended usage concentrations for the fruit or vegetable being processed. The use of a calcium carbonate buffer to control pH is recommended. Maintain the pH of the use solution between 6.0 and 8.0 with a dilute solution of hydrochloric acid.

For citrus quarantine, use at 200 ppm at pH 6.0 to 7.5. Apply for two minutes using a suitable spray or dip tank treatment.

ACCEPTED
with COMMENTS
EPA Letter Dated:

AUG 21 2009

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended for the pesticide, registered under EPA Reg. No. 72315-1

DOSAGE IN FRUIT AND VEGETABLE TREATMENT

Available Chlorine Required in Treatment Water

Maintain the following temperatures: Tank/Flume: 60 - 70°F Spray: 65 - 75°F Hydrocooler: 34 - 40°F

COMMODITY	TREATMENT METHOD	AVAILABLE CHLORINE TO APPLY (ppm)	COMMENTS
Apples	Dump Tank Flume Spray	100 – 150 30 – 50 100 – 150	For dump tank and flume, submerge the apples for 90 seconds. For spray, maintain contact for 5 – 15-seconds.
Artichokes	Spray	100 –150	Spray for 5 – 15 seconds.
Asparagus	Spray Hydrocooler	100 – 150 125 – 150	Spray for 5 – 15 seconds. Hydrocool for 20 - 30 minutes.
Bell Peppers	Dump Tank Spray	100 – 135 300 - 400	Immerse in dump tank for 2 – 5 minutes. Spray for 5 – 15 seconds.
Brussels Sprouts	Spray	100 – 150	Spray for 5 – 15 seconds.
Cabbage (Chopped)	Spray	80 – 100	Spray for 5 – 15 seconds. After treatment, the adhering moisture must be removed by centrifuging.
Carrots	Dump Tank Flume Spray	100 – 200 100 – 200 50 – 100	Immerse in dump tank or flume for 1 - 5 minutes. Spray for 5 – 15 seconds.
Cauliflower	Spray	300 – 400	Spray for 5 – 15 seconds.
Celery	Spray	100	Spray for 5 – 15 seconds.
Cherries	Spray	75 – 100	Spray for 5 – 15 seconds.
Garlic	Spray Tank	75 – 100 75 – 150	Spray for 5 – 15 seconds. Immerse in tank for 2 - 5 minutes contact.
Grapefruits	Spray Drench	40 – 75 100 – 150	Spray for 5 – 15 seconds. Drench for 3 - 5 minutes. For citrus quarantine treatment, use 200 ppm of available chlorine at pH 6.0 - 7. 5 in drench tank.
Lemons	Dump Tank	30 – 50	Immerse in dump tank for 2 - 3 minutes.
Lettuce (butter)	Spray	10 – 20	Spray for 5 – 15 seconds.
Lettuce (chopped)	Spray	30 - 75	Spray for 5 – 15 seconds. After treatment, the adhering moisture must be removed by centrifuging.

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Lettuce (romaine)	Spray	20 - 40	Spray for 5 – 15 seconds.
Mushrooms	Spray	100 –200	Spray for 5 – 15 seconds. After treatment with the chlorinated water, mushrooms must be treated with anti-oxidant to prevent browning.
Onion (dry)	Spray Tank	75 –150 75 –150	Spray for 5 – 15 seconds. Immerse in tank for 2 - 3 minutes.
Onions (green)	Spray	75 – 120	Spray for 5 – 15 seconds.
Oranges	Drench Spray	100 – 200 40 – 75	Drench for 3 - 5 minutes. Spray for 5 – 15 seconds.
Nectarines	Hydrocooler Spray	30 – 75 50 – 100	Hydrocool for 20 - 30 minutes. Spray for 5 – 15 seconds.
Peaches	Hydrocooler Spray	30 – 75 50 – 100	Hydrocool for 20 - 30 minutes. Spray for 5 – 15 seconds.
Pears	Dump Tank	200 – 300	Immerse in tank for 2 - 3 minutes
Peppers (Not for use in CA)	Spray	300 – 400	Spray for 5 – 15 seconds.
Pineapples (Not for use in CA)	Spray Drench Dump Tank	100 -150 40 -100 30 - 100	Spray for 5 – 15 seconds. Drench for 3 -5 minutes. Remove from tank after 2-5 minutes. Potable water rinse is not required for pineapple.
Plums	Hydrocooler Spray	30 – 75 50 – 100	Hydrocool for 20 - 30 minutes. Spray for 5 – 15 seconds.
Potatoes	Dump Tank Flume Spray	30 – 100 200 – 300 100 - 200	Immerse in tank or flume for 2 - 5 minutes Spray for 5 – 15 seconds.
Potatoes (white)	Spray	500 – 600	This concentration of chlorine should be used only if bleaching of potatoes is desirable. Spray for 5 – 20 seconds.
Radishes	Tank Spray	10 – 25 100 – 150	Immerse in tank for 1 – 12 seconds Spray for 5 – 15 seconds.
Spinach (Not for use in CA)	Spray	75 – 150	Spray for 5 – 15 seconds.
Tomatoes	Tank Spray	200 – 350 100 – 150	Immerse in tank for 2 - 3 minutes. Spray for 5 – 15 seconds.
Yams	Tank	100 – 200	Immerse in tank for 2 - 3 minutes.

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DIRECTIONS FOR USE AS A MACROFOULANT CONTROL AGENT FOR INDUSTRIAL WATER SYSTEMS

Aquatic macrofouling organisms (i.e. Zebra Mussel (Dreissena polymorpha), Quagga Mussels (Dreissena bugensis), Blue Mussels (Mytilus edulis), Asian Clam (Corbicula fluminea)) can detect chemical changes in their environment and close their shells for a period of weeks. The closure period may last 3 - 5 weeks. This condition will remain until those changes are no longer detected, or the organisms die through lack of respiration. Chemical treatment times and concentrations may vary, because of the organism's biological ability of detection; the extent of the macrofoulant contamination; and the design variations of the system.

Single Exposure - To control macrofoulants, add this product to the water in the system to obtain a residual chlorine concentration of 10-20 ppm. For the best results treat during the breeding season and/or at the end of the season for at least 30 days. The release of zebra mussels for weeks after this method of treatment is not uncommon.

Semi-Continuous Exposure - To control macrofoulants, add this product to the water in the system, 15 to 30 minutes a day, to obtain a residual chlorine concentration of 5-10 ppm. For the best results, initiate treatment during the breeding season (June to September).

Continuous Exposure - To control macrofoulants, add this product to the water in the system to obtain a residual chlorine concentration of 5-10 ppm. For the best results, apply during the breeding season (June to September).

Alternatively, make a 1.5 wt. % available chlorine (AvCl) solution and dose as follows:

Treatment Method	Dosage pump rate with 1.5 wt. % AvCl Solution
Single Dosage (10-20 ppm)	40-80 gph per 1,000 gpm of flowing water
Semi-continuous (5-10 ppm)	20-40 gph per 1,000 gpm of flowing water
Continuous (5-10 ppm)	20-40 gph per 1,000 gpm of flowing water

Note: Always test for available chlorine to insure proper dosage rates are achieved. If treatment levels would exceed NPDES/SPDES permit limits, dechlorination must be performed prior to discharge of the treated effluent.

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EPA Letter Dated:

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CHLORINE DOSAGE IN CONTINUOUS FLOW SYSTEMS

Weight of Chlorine Gas Required per Day

WATER FLOW		DESIRED LEVEL OF AVAILABLE CHLORINE							
G/MIN	G/DAY	0.5 ppm	1.0 ppm	2.0 ppm	3.0 ppm	4.0 ppm	5.0 ppm	6.0 ppm	8.0 ppm
10	14,400	1 oz	2 oz	4 oz	6 oz	8 oz	10 oz	12 oz	16 oz
15	21,600	1.5 oz	3 oz	6 oz	9 oz	12 oz	15 oz	18 oz	21 oz
20	28,800	2 oz	4 oz	8 oz	12 oz	16 oz	20 oz	24 oz	32 oz
30	43,200	3 oz	6 oz	12 oz	18 oz	24 oz	30 oz	36 oz	48 oz
40	57,600	4 oz	8 oz	16 oz	24 oz	32 oz	40 oz	48 oz	64 oz
50	72,000	5 oz	10 oz	20 oz	30 oz	40 oz	50 oz	60 oz	80 oz
60	86,400	6 oz	12 oz	24 oz	36 oz	48 oz	60 oz	72 oz	96 oz
70	100,800	7 oz	14 oz	28 oz	42 oz	56 oz	70 oz	84 oz	112 oz
80	115,200	8 oz	16 oz	32 oz	48 oz	64 oz	80 oz	96 oz	128 oz
90	129,600	9 oz	18 oz	36 oz	54 oz	72 oz	90 oz	108 oz	144 oz
100	144,400	10 oz	20 oz	40 oz	60 oz	80 oz	100 oz	120 oz	160 oz
150	216,000	15 oz	30 oz	60 oz	90 oz	120 oz	150 oz	180 oz	240 oz
200	288,000	20 oz	40 oz	80 oz	120 oz	160 oz	200 oz	240 oz	320 oz
300	432,000	30 oz	60 oz	120 oz	180 oz	240 oz	300 oz	360 oz	480 oz

1 lb. = 16 oz

To obtain a desired chlorine level for a known water flow rate, find the desired chlorine level in ppm at the top of the chart. Follow the column down until you are opposite the flow rate for your equipment. The figure in that column is the weight of chlorine that must be added daily. If the desired chlorine level is not shown on the chart, multiply the chart values to get the correct dosage level.

Example: To obtain 4 ppm at a flow rate of 100 gallons per minute, add 80 oz or 80/16 = 5 lb. of chlorine per day. To obtain 100 ppm at a flow rate of 60 gallons per minute, use 12 x 100 = 1200 oz or 1200/16 = 75 lb. chlorine per day.

CHLORINATOR INSTRUCTION BOOKLET

SAFETY

1. Chlorine is corrosive to iron, brass and copper. Plastic lines should be used whenever practical.

2. Locate the chlorinator outside the building or room in which people normally work. Use plastic pipe to transport the chlorinated water.

3. Chlorine cylinders must be chained to a wall near a chlorinator.

4. If the chlorinator must be located inside the building, place it next to an outside wall or corner. Locate it as far away as possible from personnel.

5. Chlorine Gas label should be attached to each cylinder. Above the cylinder a sign (approximately 10 x 14 inches) stating "DANGER – CHLORINE" should be posted in clear view.

6. Chlorine is highly reactive when in contact with OPP or SOPP. DO NOT mix chlorine with water solution or wax containing OPP or SOPP.

7. When chlorine and OPP are used on the same line, chlorine treated commodities should be followed by a fresh water rinse or have a minimum interval of 10 seconds between chlorine application and OPP application to allow the chlorine to dissipate.

8. Read and follow the chlorinator manual before operating or changing the chlorine cylinder.

9. Read and follow the precautionary statements and statement of practical treatment on the label before using this product.

10. Refer to the Chlorine manual for additional safety information.

DAILY CHECK LIST

1. Check the chlorine leak – This can be done by using ammonia. White smoke appears when ammonia comes in contact with chlorine gas. If a leak is detected shut the system down completely. Do not operate the system until the leak is fixed.
2. Correct pH and chlorine concentration – These are the most important factors in determining the effectiveness of t chlorine. The chlorine concentration should be checked at least twice daily and adjustments should be made whenever necessary. Use test paper or field colorimetric test kit to determine the chlorine concentration and pH. Maintain the pH between 7.2 and 7.8.

3. Soda Ash is used as a pH buffer in the wash process. Use a 55 gallon plastic lined drum of Soda Ash. Add more when the drum is less than ¾ full. Constant flow of fresh water to this tank is necessary. The in-flow of water should be the same as outflow of chlorinated water. Percolate the chlorine from the bottom of the tank and take the chlorinated water from the top. Maintain pH between 7.2 – 7.8.

ACCEPTED
with COMMENTS
EPA Letter Dated:
AUG 21 2009
Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide, registered under EPA Reg. No. 72315-1

117061

CHLORINE DOSAGE IN CHLORINATOR SYSTEMS
Weight of Chlorine Gas Required per 1000 Gallons

DESIRED LEVEL OF AVAILABLE CHLORINE	CHLORINE REQUIRED PER 1000 GALLONS
10 ppm	1.35 oz
20 ppm	2.70 oz
30 ppm	4.00 oz
40 ppm	5.40 oz
50 ppm	6.75 oz
60 ppm	8.00 oz
70 ppm	9.40 oz
80 ppm	10.80 oz

DESIRED LEVEL OF AVAILABLE CHLORINE	CHLORINE REQUIRED PER 1000 GALLONS
90 ppm	12.15 oz
100 ppm	13.50 oz
150 ppm	20.00 oz
200 ppm	27.00 oz
300 ppm	40.00 oz
400 ppm	52.00 oz
500 ppm	65.00 oz
600 ppm	78.00 oz

1 lb. = 16 oz

Select the concentration (ppm) desired and add the corresponding amount of chlorine gas to 1,000 gallons of chlorine free water.

Example: For a 300 ppm chlorine solution in 1,000 gallons of water, add 40 ounces of chlorine gas to chlorine free water. For a 300 ppm chlorine solution in 5,000 gallons of water, add five times as much chlorine gas or 200 ounces.