

PM 32

67714-2

1179

US ENVIRONMENTAL PROTECTION AGENCY OFFICE OF PESTICIDES PROGRAMS REGISTRATION DIVISION (75-767) WASHINGTON, DC 20460  <b>NOTICE OF PESTICIDE:</b> <input checked="" type="checkbox"/> REGISTRATION <input type="checkbox"/> REREGISTRATION <i>(Under the Federal Insecticide, Fungicide,          and Rodenticide Act, as amended)</i>	EPA REGISTRATION NO.	DATE OF ISSUANCE
	67714-2	JUL 21 1995
	TERM OF ISSUANCE Conditional NAME OF PESTICIDE PRODUCT Hawkins Ag-Chlor (Liquified Gas Under Pressure)	
NAME AND ADDRESS OF REGISTRANT (Include ZIP code)  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">           Pool Chem, Inc.            5455 S. Villa Avenue            Fresno, CA 93725         </div>		
<p><b>NOTE:</b> Changes in labeling formula 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 U.S. EPA registration number.</p> <p>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.</p> <p>A copy of the labeling accepted in connection with this Registration/Reregistration is returned herewith.</p> <p>Registration is in no way to be construed as an indorsement or approval of this product by this 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.</p> <p>This product is conditionally registered in accordance with FIFRA sec. 3(c)(7)(A) provided that you:</p> <ol style="list-style-type: none"> <li>1. Submit/cite all data required for registration/reregistration of your product under FIFRA section 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.</li> <li>2. Make the labeling changes listed below before you release the product for shipment:             <ol style="list-style-type: none"> <li>a. Add the phrase "EPA Registration No. 66714-2."</li> <li>b. Add the following to the text of the first paragraph appearing on the container label:                 "For use only under the supervision and employment of the owner of this registration. The registrant is solely responsible for the safety of the servicing equipment used with this pesticide. The registration is not transferrable. Supplemental registrants under 40 CFR section 152.132 are not allowed under this registration. This product may not be transferred to portable cylinders for providing a pesticidal service under this EPA Reg. No., except by the registrant."</li> </ol> </li> </ol> <p><input type="checkbox"/> ATTACHMENT IS APPLICABLE</p>		
SIGNATURE OF APPROVING OFFICIAL		DATE
		JUL 21 1995

1818

c. In the Ingredient Statement, place a zero in front of the decimal point for the concentration of inert ingredients, as in 0.5%.

d. On the front panel, the word "POISON", next to the skull and crossbones, will be printed in red ink on the final label.

e. In the Statement of Practical Treatment (First Aid) section, revise the sentence "In case of contact, ..." to: "in case of eye contact ...".

f. Add the following instructions to the text of the Statement of Practical Treatment: "IF ON SKIN: Wash with plenty of soap and water while removing contaminated clothing and shoes. Seek medical attention."

g. Revise the text of the Precautionary Statements under the "Hazards to Humans and Domestic Animals" heading to read as follows:

"DANGER: Fatal if inhaled or absorbed through skin. Corrosive. Causes irreversible eye damage and skin burns. Do not breathe vapors or get in eyes, on skin or on clothing. Wear goggles., protective clothing and rubber gloves. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco products. Remove and wash contaminated clothing before reuse. Prolonged or repeated skin contact may cause allergic reactions in some individuals."

h. In the Physical and Chemical hazards section, revise the sentence "Do not drip container" to "Do not drop container."

i. Add the following statements to the container label under the "Storage And Disposal" heading:

"Segregate chlorine containers from other compressed gases, and never store near hydrocarbons, finely divided metals, turpentine, ether, anhydrous ammonia, or other flammable materials. If the container is damaged or leaking, refer to procedures in the Chlorine Manual and/or notify supplier immediately. All valves must be closed tight and closures or caps secured. It is illegal to ship a leaking chlorine container."

j. Revise the Environmental Hazards statement according to PR Notice 93-10 (published July 29, 1993): "This product is toxic to fish and aquatic organisms. Do not contaminate water by cleaning of equipment or disposal of wastes. 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

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."

3. In accordance with PR Notice 87-1, make the following revisions to the supplemental chemigation manual entitled "Hawkins Ag-Chlor Instruction Booklet" considered part of the pesticide label for this product registration:

a. In the "Directions For Use" section, page one of the booklet, indicate if the pesticide is to be applied continuously for the duration of the water (irrigation) application. If not, indicate when during the water application the pesticide is to be applied and provide reference to the Application Rate Determination section of the notebook.

b Insert an asterisk (\*) after the sentence on page two of the booklet - "Following are injection system recommendations:\*".

c. At the end of the sentence on page one of the booklet which begins "DO NOT connect an irrigation system ...", add "See page 2\*" (asterisk).

4. Submit five (5) copies of your final printed labeling before you release the product for shipment.

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.

- Chlorine gas, the active ingredient in this pesticide product registration, is exempt from the requirements of a tolerance when used preharvest or postharvest in solution on all raw agricultural commodities under 40 CFR §180.1095. The proposed use of this product registration, EPA Reg. No. 66714-2; chemigation, is provided for under this tolerance exemption.

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

Sincerely,



Ruth G. Douglas  
Product Manager (32)  
Antimicrobial Program Branch  
Registration Division (7505C)

1107-4

**HAWKINS  
AG-CHLOR**  
(Liquefied Gas Under Pressure)  
**NON-FLAMMABLE**

For use in chemigation, chlorination and for the control of bacteria, algae, slime build up and clogging in the low-volume (drip/trickle/micro-sprinkler) irrigation systems only by trained or qualified service personnel only in accordance with the directions and supervision of the registrant of this pesticide product. This label must be in the possession of the user at the time of application. This product may be repackaged into portable cylinders and used as an ingredient or intermediate in the manufacture of pesticide products.

**NOTE:** Repackagers and pesticide manufacturers using this product must obtain their own registration and establishment number from the United States Environmental Protection Agency.

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<b>ACCEPTED</b> with <b>COMMENTS</b> by EPA Letter Dated:	ACTIVE INGREDIENT: Chlorine . . . . . 99.5%
	INERT INGREDIENTS: . . . . . 5%
	<b>TOTAL:</b> . . . . . 100.0%

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**KEEP OUT OF REACH OF CHILDREN**

JUL 21 1987  
Under the Federal Insecticide,  
Fungicide, and Rodenticide Act as  
amended for the pesticides  
registered under EPA Reg. No.  
67014-3

**DANGER**  **POISON**

**STATEMENT OF PRACTICAL TREATMENT AND FIRST AID**

If inhaled, move to fresh air, keep warm and quiet and call a physician. If not breathing give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Immediately get medical attention. Have approved U.S. Bureau of Mines Gas Masks available. Make daily inspection for leaks. Stop leak at once since it will become greater with time.

**PRECAUTIONARY STATEMENTS  
HAZARDS TO HUMAN & DOMESTIC ANIMALS**

**DANGER:** Corrosive, may cause severe skin and eye irritation or chemical burns to broken skin. Causes eye damage. Wear safety glasses or goggles and rubber gloves when handling this product. Wash after handling. Avoid breathing vapors. Vacate poorly ventilated areas as soon as possible. Do not return until strong odors have dissipated

**ENVIRONMENTAL HAZARDS**

This pesticide is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product into sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the U.S. Environmental Protection Agency, the state authority authorized to issue NPDES permits or Pool Chem, Inc.

**PHYSICAL AND CHEMICAL HAZARDS**

**STRONG OXIDIZING AGENT:** Mix only with water according to label directions. Mixing this product with chemicals (e.g., ammonia, acids, detergents, etc.) or organic matter (e.g., urine, feces, etc.) will release chlorine gas which is irritating to eyes, lungs, and mucous membranes. Chlorine is a non-flammable gas which is liquefied and under pressure. Do not drip container. Keep away from intense heat or open sunlight. Chlorine is corrosive to most metals in the presence of moisture.

SW:K

**DIRECTIONS FOR USE**

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

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

**STORAGE AND DISPOSAL**

Keep tanks and cylinders away from heat. Store in a cool dry area. Do not store in direct sunlight. Do not drop containers. All containers must be attached with a weather resistant label near the outlet valve. Store cylinders away from reach by the general public. Empty cylinders should be properly identified with return tags and returned to the supplier in accordance with its instructions.

Before using **HAWKINS AG-CHLOR (Liquefied Gas Under Pressure)**, please read and carefully observe the Precautionary Statements, all other information appearing on the product label and refer to the supplemental labeling **HAWKINS AG-CHLOR (Liquefied Gas Under Pressure) INSTRUCTION BOOKLET** for use directions for chemigation, chlorination and control of bacteria, algae, slime build up and clogging in the low-volume (drip/trickle/micro-sprinkler) irrigation systems. **DO NOT** apply this product through any irrigation system unless the supplemental labeling on chemigation is followed.

Before handling or moving, have available gas masks approved by the U.S. bureau of Mines or 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.: Washington, D.C. Use only in well ventilated areas.

**Packaged by:**  
**POOL CHEM, INC.**  
5455 S. Villa Avenue  
Fresno, CA 93725  
(209) 486-3800

EPA REG. NO. 67714-XXXX

EPA EST. NO. CA-1

NET WEIGHT:  20 LBS.  150 LBS.  2,000 LBS.

ACCEPTED  
with COMMENTS  
to EPA Letter Dated

JUL 21 1995

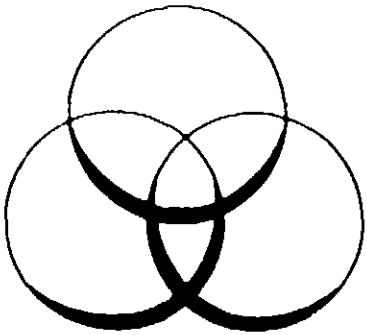
Under the Federal Insecticide,  
Fungicide, and Rodenticide Act as  
amended, this pesticide  
registered under EPA Reg. No.

67714-2

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**INSTRUCTION BOOKLET**



ACCEPTED  
with COMMENTS  
by EPA Letter 1/10/68

JUL 2 1968

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

67719-2

**HAWKINS**  
**AG-CHLOR**  
(Liquefied Gas Under Pressure)

ACTIVE INGREDIENT:	Chlorine Gas.....	99.5%
INERT INGREDIENTS:	.....	5%
TOTAL:	.....	100.0%

**KEEP OUT OF REACH OF CHILDREN**

**DANGER**        **POISON**

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

**FOR LOW-VOLUME IRRIGATION SYSTEMS USE ONLY**

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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.

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

### *DIRECTIONS FOR CHEMIGATION, CHLORINATION AND FOR THE CONTROL OF BACTERIA, ALGAE, SLIME BUILD-UP AND CLOGGING*

Apply this product only through low-volume (drip/trickle/micro-sprinkler) irrigation systems. **DO NOT** apply this product through any other type of irrigation system.

Chlorine gas contains 100% available chlorine. While using chlorine gas is generally considered the least expensive method of injecting chlorine, it is also the most hazardous if used without following the directions by trained or qualified service personnel only in accordance with the directions and supervision of the registrant of this pesticide product

Chlorine gas may be dissolved directly into the supply line with the use of a metering device called a chlorinator. Pressure relief valves should be installed on any tanks holding solutions of chlorine to guard against a build-up of pressure.

Irrigators wishing to inject chlorine gas should use a injection equipment (venturi injector device or a positive displacement injection pump). Batch Tanks are not appropriate or recommended.

Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water.

If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts.

**DO NOT** connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label prescribed safety devices for public water systems are in place.

A person knowledgeable of the chemigation system and responsible for its operation or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

### *APPLICATION CHLORINE INJECTION RATES*

If the irrigation water has high levels of bacteria, algae, clogging and build up, continuous chlorination may be necessary. The recommended level of free available chlorine is 1 to 2 ppm, measured at the end of the farthest lateral with a good quality pool/spa chlorine test kit.

Periodic injection (once every two to three weeks), at a higher chlorine rate 10 to 20 ppm may be appropriate where bacteria, algae, clogging and build up are less of a problem. The frequency of the chlorine injection depends on the extent of organic clogging.

Superchlorination bringing chlorine concentrations to within 50 to 100 ppm is recommended for reclaiming low-volume irrigation systems clogged by algae and bacterial slimes. Shut the system down, leave for up to 24 hours and then flush all submains and laterals. This high concentration of chlorine vigorously attacks organic material and will help clear the blockage.

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

Chlorine Gas Injection Rate (lbs./day)	=	System Flow Rate (gpm)	x	Desired Chlorine Concentration (ppm)	x	0.012
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*Example:*

36 (lbs./day)	=	1500 (gpm)	x	2 (ppm)	x	0.012
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*Following are precautions to be followed in performing chemigation and chlorination:*

1. Injection should be started with the system operating.
2. Inject the chlorine upstream from the filter to help keep the filter clean and so that the filter can remove any precipitates that may be caused by the chlorine injection. Chlorine is a very effective oxidizing agent and will cause any iron and manganese present in the water to precipitate and to clog the emitters.
3. Determine the level of free chlorine using a chlorine test kit. Allow sufficient time to achieve a steady reading.
4. Acids and chlorine should never be stored together.
5. **DO NOT** inject chlorine when fertilizers, herbicides, and insecticides are being injected, since the chlorine may destroy the effectiveness of these compounds.

*Following are injection system recommendations:*

1. The system must contain a functional check valve, vacuum relief valve and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
2. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
3. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
4. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
5. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. Systems must use a metering pump such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.



9/2/11

**DETERMINING APPLICATION RATE**

Determining the application rate of low-volume (drip/trickle/micro-sprinkler) irrigation systems can be confusing because irrigation scheduling and crop water use information is usually presented in inches per day (in./day), while discharge from low-volume emitters is measured in gallons per hour (gph). The following may be helpful in determining required operating times for low-volume irrigation systems.

The water use of the crop and the application rate of the emission device(s) determines how long drip/trickle/micro-sprinklers should be operated.

**Step 1**

Step 1 in determining the required operating time is to convert the crop water use information (usually available in inches per day), to gallons per day of plant water use. The following formula may be used (or see Table 1):

Water Use by the Plant (gal./day)	=	Plant Spacing (ft <sup>2</sup> )	x	Crop Water Use (in./day)	x	0.623
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*Example:*

Tree Crop Spacing -- 20 ft. x 20 ft -- 400 ft<sup>2</sup>  
 Crop Water Use = 0.3 in./day  
 Water Use by the Plant -- 400 ft<sup>2</sup> x 0.3 in./day x 0.623  
 = 75 gal./day  
 or refer to (Table 1)

**Table 1**

*Crop Water Use (gal./day) for various Plant Spacings and Crop Water Use (in./day)*

Crop Spacing (ft <sup>2</sup> )	Crop Water Use (in./day)							
	0.05	0.1	0.14	0.2	0.25	0.3	0.35	0.4
100	3	6	9	12	16	19	22	25
200	6	12	19	25	31	37	44	50
400	12	25	37	50	62	75	87	100
600	19	37	56	75	93	112	131	150
800	25	50	75	100	125	150	174	199
1000	31	62	93	125	156	187	218	249
1200	37	75	112	150	187	224	262	299
1400	44	87	131	174	218	262	305	349
1600	50	100	150	199	249	299	349	399
1800	56	112	168	224	280	336	392	449
2000	62	125	187	249	311	374	436	498
2200	69	137	206	274	343	411	480	548
2400	75	150	224	299	374	449	523	598

Crop Spacing (ft<sup>2</sup>) = Row Spacing (ft) x Plant Spacing (ft)

**Step 2**

Step 2 is to determine the application rate of the irrigation system in gallons per hour (gal./hr.). For both drip emitters and micro-sprinklers, this requires determining: (1) the number of emission devices per plant, and (2) the discharge rate per emission device (gal./hr./emitter):

Application Rate (gal./hr.)	=	Number of Emission Devices	x	Discharge Rate per Emission Device (gal./hr./emitter)
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**Example:**

**Drip Emitters:** 4 drip emitters per tree  
 Discharge Rate per emitter = 1 gal./hr.  
 Application Rate (gal/hr) = 4 emitters/tree x 1 gal./hr. per emitter

**Micro-Sprinklers:** 1 micro-sprinkler per tree  
 Discharge Rate per micro-sprinkler = 12 gal/hr  
 Application Rate (gal/hr) = 1 micro-sprinkler/tree x 12 gal/hr per micro-sprinkler

**Step 3**

*Step 3* is to determine the irrigation system operation time in hours per day. This requires the crop water use (determined in *Step 1*), and the application rate (determined in *Step 2*). The following formula may be used (or see *Table 2*):

Hours of Operation per day	=	$\frac{\text{Crop Water Use (gal./day)}}{\text{Application Rate (gal./hr.)}}$
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**Table 2**

*Hours of Operation per day for various Application Rates (hrs./day) and Crop Water Use (gals./day)*

Crop Water Use (gal/day)	Application Rate (gal/hr.)										
	1	2	3	6	8	16	12	14	16	18	20
5	5.0	2.5	1.3								
10	10.0	5.0	2.5	1.7	1.3	1.0					
15	15.0	7.5	3.8	2.5	1.9	1.5	1.3	1.1			
25		12.5	6.3	4.2	3.1	2.5	2.1	1.8	1.6	1.4	1.3
50			12.5	8.3	6.3	5.0	4.2	3.6	3.1	2.8	2.5
75			18.8	12.5	9.1	7.5	6.3	5.4	4.7	4.2	3.8
100				16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0
125				20.8	15.6	12.5	10.4	8.9	7.8	6.9	6.3
150					18.8	15.0	12.5	10.7	9.4	8.3	7.5
175					21.9	17.5	14.6	12.5	10.9	9.7	8.8
200						20.0	16.7	14.3	12.5	11.1	10.0
225						22.5	18.8	16.1	14.1	12.5	11.3
250							20.8	17.9	15.6	13.9	12.5
275							22.9	19.6	17.2	15.3	13.8
300								21.4	18.8	16.7	15.0
325								23.2	20.3	18.1	16.3
350									21.9	19.4	17.5
375									23.4	20.8	18.8
400										22.2	20.0
425											21.3
450											22.5
475											23.8

**Example:**

**Drip Emitters.**

Crop Water Use (gal/day) = 75 gal/day (*Step 1*)  
 Application Rate (gal/hr) = 4 gal/hr (*Step 2*)  
 Hours of Operation per day = 75 gal/day ÷ 4 gal/hr = 18.8 hrs/day

**Micro-Sprinklers.**

Crop Water Use (gal/day) = 75 gal/day (*Step 1*)  
 Application Rate (gal/hr) = 12 gal/hr (*Step 2*)  
 Hours of Operation per day = 75 gal/day ÷ 12 gal/hr = 6.3 hrs/day

*Table 2* gives the same Hours of Operation for these examples

Drip tapes and tubings, placed on the soil surface or subsurface, are most often used for irrigating row crops. Determining daily operation times for these systems is somewhat more complicated than for drip emitters and micro-sprinklers, but follows a similar three-step process. The discharge rate of drip tapes and tubings is usually given in gallons per minute per 100 feet of material (gal./min. per 100 ft).

**Step 1**

Step 1 is to determine the crop water use in inches per day (in./day), which is the standard measure used in evapotranspiration (ET)-based methods of irrigation scheduling

**Step 2**

Step 2 is to determine the application rate of the drip tape or tubing in inches per hour (in./hr.). Table 3 can be used to make this determination if the row spacing and the irrigation system flow rate (gal./min. per 100 feet) are known.

**Example:**  
 Row Spacing = 60 inches  
 Drip Tape Flow Rate = 0.5 gal./min. per 100 ft  
 From Table 3 The Application Rate = 0.1 in./hr.

**Table 3**

*Application Rate (in./hr.) of Drip Tapes and Tubings for various Flow Rates and Spacings*

Row Spacing (in.)	Flow Rate (gal./min. per 100 ft)								
	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5
12	0.10	0.13	0.19	0.24	0.29	0.34	0.39	0.43	0.48
14	0.08	0.12	0.17	0.21	0.25	0.29	0.33	0.37	0.41
16	0.07	0.11	0.14	0.18	0.22	0.25	0.29	0.32	0.36
18	0.06	0.10	0.13	0.16	0.19	0.22	0.26	0.29	0.32
20	0.06	0.09	0.12	0.14	0.17	0.20	0.23	0.26	0.29
22	0.05	0.08	0.11	0.13	0.16	0.18	0.21	0.24	0.26
24	0.05	0.07	0.10	0.12	0.14	0.17	0.19	0.22	0.24
26	0.04	0.07	0.09	0.11	0.13	0.16	0.18	0.20	0.22
28	0.04	0.06	0.08	0.10	0.12	0.14	0.17	0.19	0.21
30	0.04	0.06	0.08	0.10	0.12	0.13	0.15	0.17	0.19
32	0.04	0.05	0.07	0.09	0.11	0.13	0.14	0.16	0.18
34	0.03	0.05	0.07	0.08	0.10	0.12	0.14	0.15	0.17
36	0.03	0.05	0.06	0.08	0.10	0.11	0.13	0.14	0.16
38	0.03	0.05	0.06	0.08	0.09	0.11	0.12	0.14	0.15
40	0.03	0.04	0.06	0.07	0.09	0.10	0.12	0.13	0.14
42	0.03	0.04	0.06	0.07	0.08	0.10	0.11	0.12	0.14
44	0.03	0.04	0.05	0.07	0.08	0.09	0.11	0.12	0.13
46	0.03	0.04	0.05	0.06	0.08	0.09	0.10	0.11	0.13
48	0.02	0.04	0.05	0.06	0.07	0.08	0.10	0.11	0.12
50	0.02	0.03	0.05	0.06	0.07	0.08	0.09	0.10	0.12
52	0.02	0.03	0.04	0.06	0.07	0.08	0.09	0.10	0.11
54	0.02	0.03	0.04	0.05	0.06	0.07	0.09	0.10	0.11
56	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10
58	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10
60	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10

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**Step 3**

Step 3 is to determine the irrigation system operation time (in hours per day) necessary to satisfy the crop water needs. This requires the crop water use (determined in Step 1), and the application rate (determined in Step 2). The formula may be used (or see Table 4):

Hours of Operation per day	=	$\frac{\text{Crop Water Use (in./day)}}{\text{Application Rate (in./hr.)}}$
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**Example:**  
 Crop Water Use (in./day) = 0.3 in./day  
 Application Rate (in./hr.) = 0.1 in./hr.  
 Hours of Operation per day = 0.3 in./day ÷ 0.1 in./hr. = 3 hr./day  
 Table 4 gives the same operation time for this example.

**Table 4**

*Operation Time (hrs./day) for various Application Rates (in./hr.) and Crop Water Use (in./day)*

Crop Water Use (in./day)	Application Rate (in./hr.)									
	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5
.05	1.0	0.5	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1
0.1	2.0	1.0	0.7	0.5	0.4	0.3	0.3	0.3	0.2	0.2
0.15	3.0	1.5	1.0	0.8	0.6	0.5	0.4	0.4	0.3	0.3
0.2	4.0	2.0	1.3	1.0	0.8	0.7	0.6	0.5	0.4	0.4
0.25	5.0	2.5	1.7	1.3	1.0	0.8	0.7	0.6	0.6	0.5
0.3	6.0	3.0	2.0	1.5	1.2	1.0	0.9	0.8	0.7	0.6
0.35	7.0	3.5	2.3	1.8	1.4	1.2	1.0	0.9	0.8	0.7
0.4	8.0	4.0	2.7	2.0	1.6	1.3	1.1	1.0	0.9	0.8

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**CONNECTING THE CHLORINE GAS CYLINDER TO THE CHLORINATION SYSTEM**

1. Start the injector water system and make sure the hydraulic conditions are satisfactory. Check the injector supply pressure gauge and the injector vacuum gauge. If conditions are satisfactory, the vacuum gauge should show a reading above 10 inches of mercury. If the chlorinator is not equipped with a vacuum gauge, remove the tubing at the injector vacuum inlet and place your hand over the opening while the injector water is running. There will be strong suction, making removal of the hand take some effort. If suction is weak, investigate hydraulic conditions further.
2. Proper Hookup Procedures - Always leave bonnet and outlet cap in place until cylinder is in place and secured properly. Remove bonnet, use the proper wrench (Chlorine Institute approved wrench no longer than 8" (200 mm) wrench) to remove cap, make sure all fittings are clean, use new gasket every time you hook up new cylinder. Use proper wrench to secure pigtail. The wrench can be chained near the use point so that it is always available.
3. When you are sure the injector system is operating properly, open the chlorine metering orifice about 25% of the maximum chlorine feed rate. If the chlorinator is connected to an automatic system, it must be put on manual before this is done. Now, turn the chlorine gas on.
4. Verify that all the tubing, manifold and auxiliary valves are correct and that all joints are properly gasketed. Be sure all chlorine valves on the supply line to the chlorinator are closed.
5. Crack open the chlorine cylinder valve. Never open Cl<sub>2</sub> cylinder valve more than 1/4 turn for testing purposes. Check all the joints from the cylinder downstream with aqua ammonia (26° Baume) vapor. Do not apply Ammonia liquid directly onto fittings or valve assemblies. If no leaks are detected, open the valve not more than one complete turn and continue on down stream. Continue until chlorine gas pressure is shown on the chlorinator gauge. If there are no leaks, the chlorinator is ready for further tests, i.e., checking range, automatic control, etc. If there is a leak, the first thing to do is to close the cylinder valve. After all leaks have been corrected, check to see the chlorinator will reach its maximum capacity. Never open Cl<sub>2</sub> valve more than 1 full turn. If it will not operate to capacity, there can be no reliance on proper operation of the system. If necessary, close valves as above described and repair chlorinator. (Note: All Cl<sub>2</sub> valves are closed in the clockwise position).
6. Fusible plug - Do not tamper with plugs under any circumstances unless the fusible plug softens. (158° F - 165° F) Then use proper methods to repair. Refer to procedures outlined on Chlorine Institute Approved Repair Kit "A"
7. Disconnection of cylinders - Always evacuate Cl<sub>2</sub> lines before disconnecting pigtail. Use proper wrench when disconnecting pigtail, replace cap and bonnet, then remove holding device (chain or chocks). Store cylinder in proper place with approved methods applied.
8. Remember the first step when trouble occurs is to turn off the cylinder. Use self-contained breathing apparatus when necessary.

Do not proceed with chlorination, if you have any questions or any uncertainties.

All personnel at a location who are involved in the handling of chlorine, or could be involved in an emergency, should be trained in emergency procedures. In addition, periodic drills should be held.

Pool Chem, Inc. technical personnel will be happy to respond to questions regarding safe handling and use procedures, safehandling and use remains the responsibility of the customer.

For further information and/or problems, the user should consult Pool Chem, Inc., The Chlorine Institute, Inc., State and Federal Regulatory Agencies and other pertinent Institute publications.

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## CHEMIGATION POSTING REQUIREMENTS

### *Posting of areas to be chemigated is required when:*

1. Any part of a treated area is within 300 feet of sensitive areas such as residential areas, labor camps, businesses, day care centers, hospitals, in-patient clinics, nursing homes or any public areas such as schools, parks, playgrounds, or other public facilities not including public roads, or
2. When the chemigated area is open to the public such as golf courses.

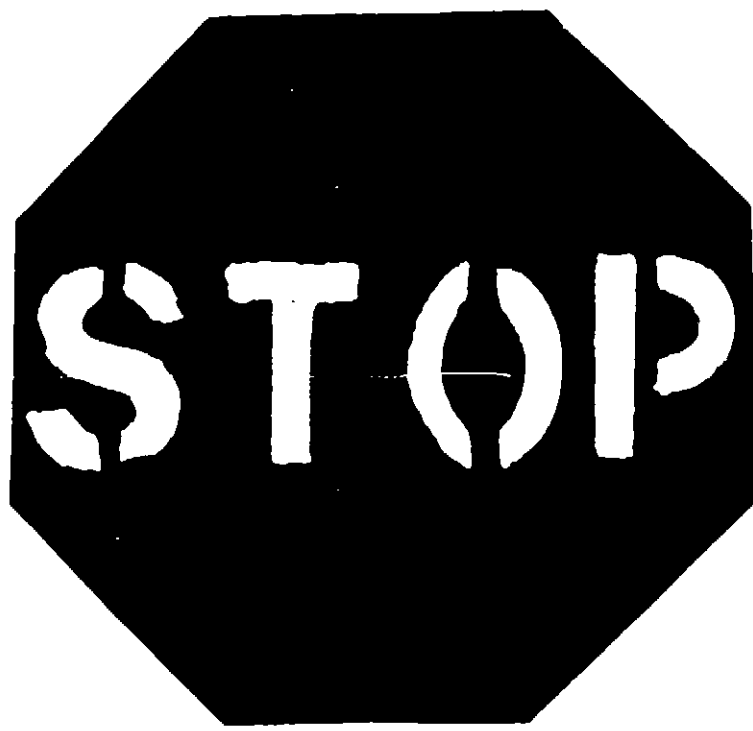
### *Posting must conform to the following requirements:*

1. Treated areas shall be posted with signs at all usual points of entry and along likely routes of approach from the listed sensitive areas.
2. When there are no usual points of entry, signs must be posted in the corners of the treated areas and in any other location affording maximum visibility to sensitive areas. the printed side of the sign should face away from the treated area towards the sensitive areas.
3. The printed side of the sign should face away from the treated area towards the sensitive area.
4. The signs shall be printed in English.
5. Signs must be posted prior to application and must remain posted until foliage has dried and soil surface water has disappeared.
6. Signs may remain in place indefinitely as long as they are composed of materials to prevent deterioration and maintain legibility for the duration of the posting period.
7. All words shall consist of letters at least 2 1/2 inches tall, and all letters and the symbol shall be a color which sharply contrasts with their immediate background.
8. At the top of the sign shall be the words "KEEP OUT," followed by an octagonal stop sign symbol at least eight (8) inches in diameter containing the word "STOP."
9. Below the symbol shall be the words "PESTICIDES IN IRRIGATION WATER." A small-scale illustration of an acceptable sign is attached.

Posting required for chemigation does not replace other posting and reentry interval requirements for farm worker safety.

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**KEEP OUT**



**PESTICIDES**

**IN**

**IRRIGATION**

**WATER**

### LOW-VOLUME MAINTENANCE

Routine maintenance can include checking for leaks, backwashing filters, periodically flushing lines, chlorinating, and cleaning or replacing clogged emitters.

#### *Filters*

Filters - whether screen or media - should be backwashed periodically to clear any collected particulate or organic matter. Clogged filters can reduce pressure to the system, lowering the water application rate. Backwashing can be done either manually or automatically. Depending on the design of the screen filter, manual backwashing is accomplished either by physically removing and cleaning the screen or by opening a valve to allow water pressure to scrub the screen clean. Manually backwashing the media filter requires initiating a backwash cycle in which water circulated from bottom, causing the media to be suspended and agitated, which washes the particulate matter out of the filter media.

Automatic backwashing of screen or media filters accomplishes the same task on an automatic, periodic basis. Most automatic backwash systems have an overriding pressure-sensing system that will initiate backwashing if a preset pressure differential across the filter--usually 4 - 6 psi--is exceeded.

#### *Flushing Lines*

Periodically flushing the lateral lines--opening the lines and allowing them to flush clear--is essential, since the filters trap only the large contaminants entering the system. The lateral lines therefore collect material that may eventually clog the emitters. Flushing clears the system of many contaminants.

How often the laterals should be flushed depends on the quality of the irrigation water and on the degree of filtration. Generally, flushing should be performed by-weekly, although less-frequent flushing may be found to be adequate. The laterals should also be flushed following fertilizer or chemical injection and any periodic chlorine injection.

Automatic flushing valves, installed on the ends of the laterals, are also available. These valves remain open until enough pressure builds up in the system to close them. Automatic flushing valves work well in some systems, but under some conditions do not provide a long enough flushing period to rid the lateral lines of all contaminants.

#### *Chlorination*

For waters with a high organic load (algae, moss, bacterial slimes), chlorination should be done with chlorine gas, sodium hypochlorite, or calcium hypochlorite. Whether chlorination should take place continually (1 to 2 ppm free chlorine at the end of lateral line) or periodically (approximately 10-20 ppm free chlorine at lateral end) depends on the severity of the clogging. Continual chlorination is usually necessary where the clogging potential is severe.

Surface water sources are more likely than ground water sources to cause organic clogging. Well water pumped into and stored in a pond or reservoir should be considered a surface water source.

#### *Emitter Maintenance*

Emitters may have to be cleaned or replaced because of clogging. The laterals and emitters should be inspected routinely to identify drip emitters that are completely clogged, although this will probably not identify emitters in which the flow has been only reduces. Partially clogged emitters will be located only if water is collected from the emitters to determine their discharge rate.

The first step in cleaning emitters is determining what is causing the clogging. Emitters and material caught when the laterals are flushed can be examined to determine the cause. If organic matter is the culprit, a high level of chlorine (50 - 100 ppm) can be injected into the line and allowed to sit for about twenty-four hours. The lines should then be thoroughly flushed. If chemical precipitation is causing the clogging, acid can be inject to lower the pH to approximately 5.0. The acid should be allowed to sit in the line for twenty-four hours and then flushed. If this does not clear the emitters, they may have to be replaced, in which case it is usually wise to leave the clogged emitter in the line and to simply install a new emitter nearby. Although some brands of drip emitters can be disassembled and cleaned, nearly all are permanently sealed



*Leaks*

Low-volume systems should be inspected regularly for leaks. This task can be performed when the system is checked for clogged emitters. Leaks can occur in hardware--compression fittings, end closures, emitter barbs, micro-sprinklers, and hose adapters--or when the above-ground polyethylene tubing is damaged by farm equipment, harvest activity, or animals.

**ADDITIONAL MAINTENANCE REQUIREMENTS**

Other maintenance tasks that should be carried out on a less-frequent basis include inspecting the filter media, inspecting the pressure-regulating valve, and replacing pressure gauges.

*Filter Media*

Tends to cake together over time and as a result may fail to provide good filtration. Frequent backwashing may be symptomatic of such a problem. Sand media should be replaced if this occurs. When the old media is removed, the under drain system should be inspected. Even if the sand media appears to be in good condition, additional media may be added periodically, since some of the sand is invariably lost during the backwash cycle.

*Pressure-Regulating Valve*

Adjustable pressure-regulating valves, set at installation, should be inspected and adjusted periodically to see that correct operating pressure is maintained. Pre-set pressure-regulators should be inspected to ensure that they are operating properly. Foreign material in the line may jam the adjustment mechanism and inhibit operation.

*Pressure gauges*

Tend to eventually wear out and should be replaced if the accuracy is in question. Liquid-filled pressure gauges, which are slightly more expensive, may be a good replacement choice. Gauges must be scaled to operate in a pressure range appropriate to the system.

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**WARRANTY AND DISCLAIMER**

**POOL CHEM, INC.** warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the Directions for Use, subject to the risks referred to therein.

**POOL CHEM, INC.** make no other express or implied warranty of fitness or merchantability or any other express or implied warranty, is made regarding performance, stability or otherwise warranty.

In no case shall **POOL CHEM, INC.** or seller be liable for consequential, special or indirect damages resulting from the use or handling of this product including, but not limited to, loss of profits, business reputation, or customers; labor cost, or other expenses incurred in repackaging, sorting or reprocessing.

**POOL CHEM, INC.** and seller offer this product and the buyer and user accept it subject to the foregoing conditions of sale and warranty which may be varied only by agreement in writing signed by a duly authorized representative of **POOL CHEM, INC.**

**ADDITIONAL INFORMATION**

Chlorine is considered an occupational health hazard by NIOSH (National Institute of Occupational Safety and Health).

<b>PRODUCT INFORMATION</b>	
<b>Product Name:</b> Chlorine	<b>Chemical Name:</b> Chlorine
<b>Chemical Family:</b> Halogen Gas	<b>Common Name or Synonym:</b> Chlorine
<b>Chlorine CAS Registry No.:</b> 7782-50-5 (Listed in the TSCA Chemical Substance Inventory)	
<b>Chemical Formula:</b> $Cl_2$	

**ACCEPTED  
with COMMENTS  
in EPA Letter dated**

JUL 21 1995

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

67714-2

**Packaged by:**  
**POOL CHEM, INC.**  
5455 S. Villa Avenue  
Fresno, CA 93725  
(209) 486-3800

EPA REG. NO. 67714-XXXX

EPA EST. NO. CA-1

NET WEIGHT:  20 LBS.  150 LBS.  2,000 LBS.

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