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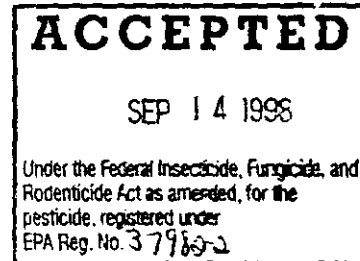
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# ALL-PURE CHLORINE GAS

ACTIVE INGREDIENT - Chlorine	99.5%
INERT INGREDIENTS	0.5%
<hr/> TOTAL	<hr/> 100.0%

**KEEP OUT OF REACH OF CHILDREN**

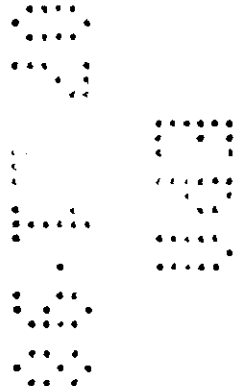


**DANGER POISON**

Manufactured and Packaged By  
All-Pure Chemical Company  
Walnut Creek, California 94596

EPA REG. NO 37982-  
EPA EST. NO. 37982-CA-1, CA-3, 65584-WA-1

Net Weight: 150 lb., 2000 lb.



## STATEMENT OF PRACTICAL TREATMENT (FIRST AID)

In case of inhalation exposure, remove patient to fresh air. It may be necessary to remove clothing. Keep warm by covering with a blanket and keep quite. Call a physician. If breathing has ceased, administer artificial respiration.

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

**DANGER:** Corrosive to eyes, skin, and mucous membranes. May be fatal if inhaled. Do not breathe air containing this gas. Do not get into eyes, on skin, or on clothing.

### ENVIRONMENTAL HAZARDS

This product is toxic to fish and aquatic organisms. Do not discharge effluent containing this product 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 into sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or regional office of U.S. Environmental Protection Agency.

### PHYSICAL AND CHEMICAL HAZARDS

Chlorine is a non-flammable gas which is liquefied and under pressure. Do not drop container. Keep away from intense heat or open sunlight. Chlorine is corrosive to most metals in the presence of moisture.

## DIRECTIONS FOR USE

### \*\*\*\* IMPORTANT \*\*\*\*

**BEFORE USING ALL-PURE CHLORINE GAS, READ AND CAREFULLY OBSERVE THE PRECAUTIONARY STATEMENTS, INSTRUCTION BOOKLET ON ALL-PURE CHLORINE GAS, ADDITIONAL SAFETY INFORMATION BOOKLETS, AND ALL OTHER INFORMATION APPEARING ON THE PRODUCT LABEL. THIS LABELING MUST BE IN THE POSSESSION OF THE USER AT THE TIME OF APPLICATION.**

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

All-Pure chlorine gas is to be used by experienced and trained personnel only.

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. or the pamphlet "Using All-Pure Chlorine Gas" published by All-Pure Chemical Company. Use in well ventilated areas. This product meets AWWA Standard B301-59.

Due to changing chlorine demands with varying water temperatures it is imperative that users of chlorine gas use a colorimetric or titrimetric test kit to accurately determine residual chlorine levels. Flow meter set points must be adjusted continuously to compensate for changing chlorine demands for any water flow rate.

All-Pure Chlorine Gas is recommended:

- as a disinfectant in the treatment of municipal drinking water supplies.
- as a disinfectant in sewage waste treatment plants.
- as a disinfectant in industrial and commercial swimming pools.
- for the control of bacteria, algae and slime build-up in plant processing equipment.
- for use in the control of algae and slime in fountains, ponds and ornamental lakes containing no fish or wildlife.
- a slimicide in water cooling systems and in paper mills.
- for the control of organisms causing decay of fruits or vegetables.

## PLANT AND FOOD PROCESSING EQUIPMENT

For the recommended concentration of available chlorine for various applications involving plant and food processing equipment, refer to the following table.

APPLICATION	CANNERIES	WINERIES	MEAT AND POULTRY
Non-porous food contact surfaces	200 ppm	200 ppm	200 ppm
Porous food contact surfaces	15 ppm	N/A	N/A
Cooling water system, including chillers, etc.	15 ppm	10 ppm	10 ppm
General cleaning, washing of plant floor, ceiling, walls, driveways, etc.	200 ppm	100 ppm	200 ppm

## ALGAE AND SLIME IN FOUNTAINS, PONDS AND ORNAMENTAL LAKES

The recommended concentration level of available chlorine for the control of algae and slime in fountains, ponds and ornamental lakes containing no fish or wildlife is 3 - 5 ppm.

## POST HARVEST TREATMENT OF FRUITS AND VEGETABLES

For the control of organisms causing decay of fruits and vegetables, please refer to the following tables for the recommended concentration levels of available chlorine. Follow the instructions provided in this document for using a chlorinator.

For treatment of fruit and vegetable commodities, do not rinse with fresh water after treatment. After treatment, moisture must be removed by centrifuging. Mushrooms must be treated with an anti-oxidant after chlorine treatment to prevent browning.

## CHLORINE DOSAGE IN FRUIT AND VEGETABLE TREATMENT

### Available Chlorine Required in Treatment Water

COMMODITY	TREATMENT METHOD	AVAILABLE CHLORINE TO APPLY (ppm)	COMMENTS
Apples	Dump Tank	100 - 500	Submerge the apples for a minimum of 45 seconds. Do not exceed 90 seconds contact time in dump tank or flume. Spray until thoroughly wet.
	Flume	30 - 50	
	Spray	100 - 150	
Artichokes	Spray	100 - 150	Spray until thoroughly wet.
Bell Peppers	Dump Tank	100 - 135	Remove after 2 - 5 minutes contact time in the dump tank. Spray until thoroughly wet.
	Spray	300 - 400	
Broccoli	Spray	100 - 150	Spray until thoroughly wet.
Brussels Sprouts	Spray	100 - 150	Spray until thoroughly wet.
Cabbage (Chopped)	Spray	80 - 100	Spray until thoroughly wet. After treatment, the adhering moisture must be removed by centrifuging.
Carrots	Dump Tank	100 - 200	Remove the carrots from dump tank and flume after 1 - 5 minutes contact time. Spray until thoroughly wet.
	Flume	100 - 200	
	Spray	50 - 100	
Cauliflower	Spray	300 - 400	Spray until thoroughly wet.
Celery	Spray	100	Spray until thoroughly wet.

Cherries	Spray	75 - 100	Spray until thoroughly wet.
Chopped Salad	Spray	80 - 100	Spray until thoroughly wet. After treatment the adhering moisture must be removed by centrifuging.
Corn	Spray	75 - 100	Spray until thoroughly wet.
Cucumbers	Spray	75 - 100	Spray until thoroughly wet.
Garlic	Tank	75 - 150	Remove from tank after 2 - 5 minutes contact.
Grapefruits	Spray Drench	100 - 150 40 - 75	Spray until thoroughly wet. Drench for 3 - 5 minutes. For citrus quarantine treatment, use 200 ppm of available chlorine at pH 6.0 - 7.5 in drench tank.
Kwi Fruit	Spray	100	Spray until thoroughly wet.
Lemons	Spray Drench	100 - 150 40 - 75	Spray until thoroughly wet. Drench for 3 - 5 minutes. For citrus quarantine treatment, use 200 ppm of available chlorine at pH 6.0 - 7.5 in drench tank.
Lettuce (Butter)	Spray	10 - 20	Spray until thoroughly wet.
Lettuce (Chopped)	Spray	80 - 100	Spray until thoroughly wet. After treatment the adhered moisture must be removed by centrifuging.
Lettuce (Romaine)	Spray	20 - 40	Spray until thoroughly wet.
Melons (all varieties)	Hydrocooler Spray	30 - 75 100 - 200	Hydrocool for 20 - 30 minutes. Spray until thoroughly wet.

Olives	Spray	10 - 100	Spray until thoroughly wet.
Onion	Spray / Tank	75 - 100	Remove from tank after 2 - 3 minutes contact time. Spray until thoroughly wet.
Onions (green)	Spray	10 - 100	Spray until thoroughly wet.
Oranges	Drench Spray	100 - 150 40 - 75	Drench for 3 - 5 minutes. For citrus quarantine treatment, use 200 ppm of available chlorine at pH 6.0 - 7.5 in drench tank. Spray until thoroughly wet.
Nectarines	Hydrocooler Spray	30 - 75 50 - 100	Spray until thoroughly wet. Hydrocool for 20 - 30 minutes.
Peaches	Hydrocooler Spray	30 - 75 50 - 100	Hydrocool for 20 - 30 minutes. Spray until thoroughly wet.
Pears	Dump Tank	200 - 300	Remove from tank after 2 - 3 minutes contact time.
Peas (pod)	Spray	50 - 100	Spray until thoroughly wet.
Peppers	Spray	300 - 400	Spray until thoroughly wet.
Plums	Hydrocooler Spray	30 - 75 50 - 100	Hydrocool for 20 - 30 minutes. Spray until thoroughly wet.
Melons (all varieties)	Hydrocooler Spray	30 - 75 100 - 200	Hydrocool for 20 - 30 minutes. Spray until thoroughly wet.
Plums	Hydrocooler Spray	30 - 75 50 - 100	Hydrocool for 20 - 30 minutes. Spray until thoroughly wet.

Potatoes	Dump Tank Flume Spray	30 - 100 200 - 300 100 - 200	Remove from tank and flume after 2 - 5 minutes contact time. Spray until thoroughly wet.
Potatoes (white)	Spray	500 - 600	This concentration of chlorine should be used only if bleaching of potatoes is desirable. Spray until thoroughly wet on cleaned potatoes.
Prunes	Spray / Tank	50 - 100	Spray until thoroughly wet. Remove from tank after 1 - 3 minutes contact time.
Pumpkins	Spray	100 - 200	Spray until thoroughly wet.
Radishes	Spray Tank	100 - 150 10 - 25	Remove from tank after 1 - 1 1/5 minutes contact time. Spray until thoroughly wet.
Spinach	Spray	75 - 150	Spray until thoroughly wet.
Squash	Spray	75 - 150	Spray until thoroughly wet.
Sweet Potatoes	Tank	100 - 150	Remove after 2 - 3 minutes of contact time in the tank.
Tomatoes	Tank Spray	200 - 350 100 - 150	Remove after 2 - 3 minutes of contact time in the tank. Spray until thoroughly wet.
Turnips	Tank	100 - 200	Remove after 2 - 3 minutes of contact time the tank.



**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  $12 \times 100 = 1200$  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 the 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. All-Pure 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 or the pamphlet "Using All-Pure Chlorine Gas" for additional safety information.

### DAILY CHECK LIST

1. Check for 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 the 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 - 7.8.

3. All-Pure Soda Ash is used as a pH buffer in the wash process. Use a 55 gallon plastic lined drum of All-Pure Soda Ash. Add more when the drum is less than 3/4 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.

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

DESIRED LEVEL OF AVAILABLE CHLORINE	CHLORINE REQUIRED PER 1000 GALLONS		DESIRED LEVEL OF AVAILABLE CHLORINE	CHLORINE REQUIRED PER 1000 GALLONS
10 ppm	1.35 oz		90 ppm	12.15 oz
20 ppm	2.70 oz		100 ppm	13.50 oz
30 ppm	4.00 oz		150 ppm	20.00 oz
40 ppm	5.40 oz		200 ppm	27.00 oz
50 ppm	6.75 oz		300 ppm	40.00 oz
60 ppm	8.00 oz		400 ppm	52.00 oz
70 ppm	9.40 oz		500 ppm	65.00 oz
80 ppm	10.80 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.

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For additional information contact your authorized All-Pure Chemical Company distributor or dealer or All-Pure Chemical Company.

### **STORAGE AND DISPOSAL**

Keep tanks and cylinders away from heat. Do not store in direct sunlight. Do not drop containers. All containers must have a weather resistant label attached near the outlet valve and must not be accessible to the general public. Empty containers should be properly identified with return tags and returned to the packager according to the methods described in the Chlorine Institute Manual or in the pamphlet Using All-Pure Chlorine Gas.