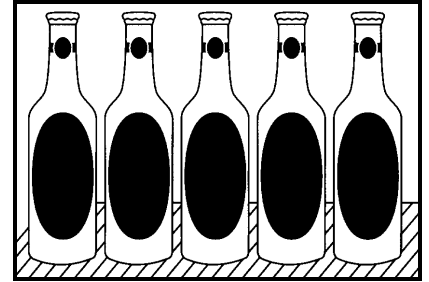


HTH[®] Dry Chlorinator for Use in: BEVERAGE PRODUCTION



Advantages of HTH[®] Dry Chlorinator: *HTH[®]* Dry Chlorinator, which contains 68% available chlorine, is calcium hypochlorite, one of the most effective sanitizers known. It is convenient, easy to use and handle, doesn't require expensive, complex metering equipment or large storage tanks, and doesn't lose strength rapidly during storage. Be sure to comply with all government regulations for use.*

CONTENTS

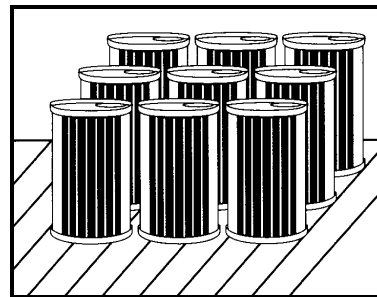
WATER SUPPLIES _____	1
CARBONATED BEVERAGES _____	1
Equipment _____	1
BREWERIES _____	2
General Sanitization _____	2
Filter Pulp _____	2
Cypress Fermenting Tubs _____	2
Washing Equipment and False Bottoms _____	2
Grain Steep Tanks _____	2
Malting Areas _____	3
Aging Cellars _____	3
Pasteurizers _____	3
Malting Of Barley _____	3
WINERIES _____	3
Plant Sanitization _____	3
Mold Control _____	3
Filling and Storage Tanks _____	3
Press Cloths _____	4
JUICES AND CIDER _____	4
Grape Juice Plants _____	4
Cider Plants _____	4
RELATED INFORMATION _____	4

WATER SUPPLIES

HTH chlorine solutions containing 1% available chlorine

will properly sanitize plant water used to produce beverages.

The HTH chlorine solution should be introduced into the water supply by a hypochlorinator. An available chlorine residual of 0.1 to 0.2 ppm must be maintained throughout the system at all times. Dechlorinate the water before use in beverages.



CARBONATED BEVERAGES

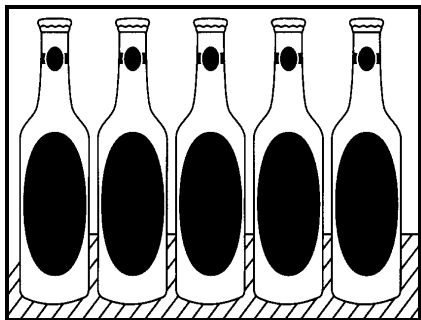
HTH[®] Dry Chlorinator is a proven disinfectant that helps prevent bacterial growth throughout the bottling plant. Solutions can be used for treating water supplies, cleaning equipment and lines, and sanitizing bottles.

Equipment

Regular treatment of all manufacturing equipment (lines, coolers, fillers, tanks) with solutions of HTH[®] Dry Chlorinator is a reliable, economical way to control bacteria and help guarantee proper quality and taste of carbonated beverages. Before bottling operations begin,

an HTH chlorine solution containing 300 ppm available chlorine should be fed through all pumps, lines and fillers that will contain beverage ingredients. (You may also use 1% HTH stock solution, 3.125 liters for every 100 liters of potable water.) Rinse all treated equipment with potable water before reusing.

After each bottling operation, all tanks which hold syrups should be thoroughly sprayed with an HTH chlorine solution containing 300 ppm available chlorine. After a 30-minute contact period, rinse tanks by hosing with potable water.



BREWERIES

Solutions of HTH[®] Dry Chlorinator provide breweries with a proven disinfectant that helps prevent bacterial growth while preserving the pure, fresh taste of the finished product.

General Sanitization

Because of its dissolving action on proteins, beer stone, slime, yeast and extraneous matter found in lines, tanks, hoses and other brewery equipment, HTH Dry Chlorinator is an effective general sanitizer for the entire plant. A hypochlorinator may be used to provide solutions as discussed above. Alternatively, fresh hypochlorite stock solutions may be prepared at the brewery using the following procedure.

To prepare a stock solution, first dissolve 3 kgs of HTH Dry Chlorinator in 12-13 liters of warm water in a 100 liter container. Introduce 1.8 kgs of soda ash and stir until dissolved. Dilute to about 75 liters with cold water, then add 3 kgs of flake caustic soda. Stir until dissolved and allow to settle.

This mixture, diluted in proportions of 1 liter of stock solution to 10 liters of water (ca. 2500 ppm available chlorine), may be used to clean and sanitize stainless steel, tile, concrete vats, piping and equipment. Rinse all treated equipment with potable water before reusing.

Filter Pulp

HTH chlorine solutions remove colloidal deposits and coloring matter on wood pulp being used as a filtering agent, thereby restoring maximum efficiency.

First, wash the filter mass in the usual manner. If a washer has been used, be sure to shut off the flow of water after washing. Add 15 grams of HTH Dry Chlorinator or 1 liter of 1% HTH stock chlorine solution for each 2 liters of water in the washer. Then run it for an hour.

If a washer is not used, place the pulp in soak water and stir in 15 grams of HTH Dry Chlorinator or 1 liter of 1% HTH stock chlorine solution for each 2 liters of water. Let it remain at 60°-65°C (140°-150°F) for 10-15 minutes. Then remove pulp and rinse it with potable water.

Cypress Fermenting Tubs

Clean tub thoroughly to free it of all surface oil. Then fill with either HTH chlorine solution containing 500 ppm available chlorine or with 1 liter of 1% HTH stock chlorine solution for every 20 liters of water. Allow solution to remain overnight, then drain and rinse well with potable water before adding wort.

Washing Equipment and False Bottoms

To sanitize false bottoms, cover them with warm water and sprinkle on 30 grams of HTH Dry Chlorinator for every 1 liter of warm water used. A 15-20 minute contact period is sufficient.

To sanitize the entire washing apparatus, including false bottoms, first cleanse in the usual way. Then flush all surfaces generously with an HTH chlorine solution containing 500 ppm available chlorine. Rinse all treated equipment with potable water before reusing.

Grain Steep Tanks

Sanitization with HTH Dry Chlorinator controls the growth of mold which often occurs in the highly humid conditions in malt houses. To sanitize steep tanks, first wash lightly with water. Then spray with an HTH chlorine solution containing 1.5 to 2.0% available chlorine. After 30 minutes contact time, wash tanks thoroughly with high-pressure potable water.

The walls of concrete germination compartments should be washed with water before treatment. Then spray with an HTH chlorine solution containing 1.5 to 2.0% available chlorine. After 30 minutes contact time, wash walls thoroughly with high-pressure potable water.

The perforated metal floors of the germination compartment should be washed with high-pressure water before treatment. Using a clean, dry, uncontaminated lawn fertilizer spreader, apply 4.5 grams of HTH Dry Chlorinator per 1000 cm² to the wet floor. After 30

minutes contact time, wash floors thoroughly with high-pressure potable water.

Malting Areas

At least once a week, the floors and walls around malt tanks should be thoroughly washed down to prevent the formation of molds and offensive odors. Wooden floors should be flushed with HTH chlorine solutions containing approximately 0.25% available chlorine. This solution may also be used to spray the walls of malting spaces.

Aging Cellars

The concrete walls of aging cellars should be sprayed regularly with HTH chlorine solutions containing 0.5% available chlorine. This procedure will kill existing mold and mildew growths and control odors.

Pasteurizers

HTH chlorine solutions effectively control slime and odors that often develop in pocket type pasteurizers. HTH chlorine solution containing 1% available chlorine should be fed into the pasteurizer's water supply line by a hypochlorinator. Adjust the hypochlorinator to a feed rate that provides a dosage of 0.5 to 1.0 ppm available chlorine at the pasteurizer overflow. When refilling pasteurizers after draining and cleaning, the hypochlorinator should be used to provide fresh water with the proper chlorine residual.

Malting of Barley

HTH Dry Chlorinator may be used in the barley steeping bath to disinfect both the barley and the water supply for the removal of troublesome bacteria and molds which can reduce alcohol yields.

Methods and quantities of application of HTH Dry Chlorinator to the steep bath vary due to variations in steeping time and temperature and to changing ratios of barley to water in the steeping operation (from 4 to 30 liters of steep water per bushel). Where steeping water temperatures do not vary too widely the simplest means of application is by addition of the dry calcium hypochlorite directly to the steep tanks while being filled. Sufficient HTH Dry Chlorinator is added to the initial steep to afford a dosage of 100 to 350 ppm available chlorine in the steep water prior to the introduction of the barley. The dosage varies with the time interval allowed for the initial steep and the character of the water supply.

A typical initial steep bath now in use consists of about 11.5 m³ of deep well water to which 5.7 kg HTH Dry Chlorinator is added dry while filling to produce a dosage of about 325 ppm available chlorine. About 1000 bushels of barley steep for a period of 4-8 hours in this solution, after which the usual overflowing and washing takes place. Sufficient improvement in the germination

qualities and overall malt quality has been noted to warrant the small additional cost.



WINERIES

Proper disinfection with HTH[®] Dry Chlorinator will prevent contamination in wineries and help ensure product quality.

Plant Sanitization

After each run, the entire plant area and its equipment should be cleaned. Then, immediately before the next run, disinfect with HTH Dry Chlorinator, using the following procedure.

Rinse the non-porous surfaces of all walls, floors and equipment with an HTH chlorine solution containing 500 ppm available chlorine. After 10 minutes, use potable water to rinse any surface that may come into contact with the wine.

Rough surfaces (wood, concrete, etc.) should be swabbed or sprayed with an HTH chlorine solution containing 1000 ppm available chlorine. After 10 minutes, any surface that will come into contact with the wine should be rinsed thoroughly with potable water.

Storage vessels, fermenting vats, casks, presses and grape crushers should all be cleaned thoroughly before treatment. Then rinse or spray with HTH chlorine solution containing 200 ppm available chlorine. After 10 minutes, equipment should be washed thoroughly with potable water.

To sanitize bottles and corks, immerse them for 5 minutes in a tank containing 200 ppm available chlorine. Rinse thoroughly to remove any remaining chlorine.

Mold Control

Any sign of mold growth should be treated immediately with HTH Dry Chlorinator to prevent further spreading.

Scrub or spray the affected surfaces with an HTH Dry Chlorinator solution containing 0.5% available chlorine. Heavy mold growths may require repeated applications.

Filling and Storage Tanks

Regular disinfection of filling and storage tanks with HTH[®] Dry Chlorinator will help maintain a high level of product quality.

After every run (just before refilling) tanks should be thoroughly sanitized with HTH® Dry Chlorinator. Wooden tanks should be filled with HTH solutions containing 500 ppm available chlorine. Solutions should be left for an hour and then removed. Rinse with potable water before refilling.

Metal or tile tanks should be filled with HTH chlorine solutions containing 250 ppm available chlorine. Wait a few minutes, then remove the solution.

When not in use, tanks and vats should be sanitized regularly with HTH® Dry Chlorinator. Fill each receptacle with water and add HTH chlorine solutions to reach a residual of approximately 15 ppm available chlorine. Test the water every week and repeat treatment if the residual falls below 2 ppm.

Press Cloths

Press cloths contaminated with bacteria and organic matter should be treated with HTH chlorine solutions to neutralize microorganisms and prevent them from spreading.

After using, wash cloths well. Then prepare the proper solution using the following procedure. For every 100 kgs or pounds dry weight of the cloth, add 125 grams of HTH® Dry Chlorinator to 500 liters of water and soak for 15 minutes.

JUICES AND CIDER

Grape Juice Plants

To sanitize equipment and problem areas in grape juice plants, follow the same treatment procedures recommended for wineries.

Cider Plants

Thoroughly clean fruit in a wash tank filled with a sanitizing solution of 38 g. of HTH® Dry Chlorinator in 1000 liters of water to make a solution of 25 ppm available chlorine. After draining the tank, submerge fruit for 2 minutes in a second wash tank containing the recirculating sanitizing solution. Fruit may also be spray rinsed with the sanitizing solution prior to pressing. Rinse fruit with potable water.

Sweet cider, stored under cold conditions, frequently develops a fungus growth which causes spoilage. Treatment of storage casks with HTH chlorine solutions containing 3% available chlorine will prevent this fungus growth and keep cider from spoiling. Clean each cask thoroughly, then rinse with the HTH chlorine solution. Remember to rinse treated casks completely with potable water before refilling.

For related information, see:

HTH® Dry Chlorinator -- Product Data Bulletin
AD6158-297

HTH® Dry Chlorinator for Use in: Cleaning and
Sanitizing HTHADS97-6

HTH® Dry Chlorinator for Use in: Agriculture and Food
Processing HTHADS97-3

Please refer to the Material Safety Data Sheet (MSDS) for complete information on Storage and Handling, Toxicological Properties, Personal Protection, First Aid, Spill and Leak Procedures, and Waste Disposal. To order an MSDS, call your Olin sales office. Review the MSDS thoroughly before handling product.

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