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HTH® DRY CHLORINATOR FOR DISINFECTION OF FOOD HANDLING EQUIPMENT

Sanitization with HTH® dry chlorinator is an easy and effective way to destroy harmful bacteria that can contaminate food handling equipment. Treatment with HTH dry chlorinator throughout food handling operations can help insure the quality and safety of the final product.

Advantages of HTH® Dry Chlorinator

HTH dry chlorinator, which contains 65% available chlorine, is a granular or tablet form of calcium hypochlorite, one of the most effective sanitizers known. It is convenient, easy to use and handle, doesn't require complex, expensive metering equipment or large storage tanks, and doesn't lose strength rapidly during storage.

All commercial sanitizers sold for biocidal applications must be registered with the U.S. Environmental Protection Agency (EPA). Olin has produced HTH dry chlorinator for over 50 years and has obtained registration for many of these applications. Some of them are presented here, but if your specific needs are not included, contact your nearest Olin sales office. Additional data are on file, or we may be able to help you obtain the necessary government registrations.

Meat Processing Plants

Solutions of HTH® dry chlorinator will control odors and bacteria in meat processing plants, while serving as effective general sanitizers.

Killing Rooms: Disinfection of the entire killing room with HTH solutions will prevent the contamination of meat and the development of offensive odors.

First, scrub the walls and floors completely. Then spray thoroughly with an HTH solution containing 5000 ppm available chlorine.

All drains and traps which blood may pass through should be flushed thoroughly with water. Then flush again with an HTH solution containing 500 ppm available chlorine. Allow this solution to remain overnight, then remove.

Inedible Rooms: HTH solutions containing 1000 ppm available chlorine will properly sanitize inedible rooms, to prevent odors and improve the handling qualities of hides and other marketable items.

Inedible rooms should be thoroughly cleaned on a regular basis. After each cleaning, spray the tank house, the press rooms and the hide rooms generously with the HTH solution.

Edible Rooms: HTH solutions containing 1000 ppm available chlorine will control bacteria in edible rooms (refrigerating, curing and processing areas) to prevent taste and color problems in the products.

All edible rooms should be thoroughly cleaned on a regular basis. After each cleaning, all room surfaces and equipment should be sprayed well with the HTH solution. After spraying, wait 2 minutes, then rinse thoroughly with fresh water.

Equipment and Utensils: HTH solutions containing 200 ppm available chlorine will sanitize all equipment and utensils that come in contact with meat, to help prevent contamination.

Clean equipment and utensils thoroughly, removing all fat and grease. Spray or rinse with HTH solution. Wait two minutes, then rinse all metal surfaces with fresh water. For other surfaces, allow to drain or air dry before contacting food surfaces.

Locker Rooms, Elevator Pits and Toilets: HTH solutions containing 5000 ppm available chlorine will sanitize and deodorize locker rooms, elevator pits and toilets, to provide employees with uncontaminated facilities.

Locker rooms, shower rooms, toilets, urinals and drains should be cleaned and sprayed or flushed with the HTH solution on a regular basis. After treatment, wait 10 minutes and rinse exposed metal surfaces with clear water to prevent corrosion.

For toilet bowls, add 1 level tablespoon of HTH to the residual water and swab.

Laundry Department: All linens, clothing, cheesecloth, ham wrappings and other laundry items which may come in contact with the product should be disinfected with an HTH bleaching solution while being washed.

To prepare this solution: Stir 3¾ pounds of HTH dry chlorinator in a 30 gallon plastic container holding 10 gallons of warm water. Add 3 pounds of soda ash and mix thoroughly. Immediately before using, dilute the solution to 30 gallons.

When the wash wheel is in its second rinse, add 2 quarts of the bleaching solution for each 64 gallons of water (100 pounds dry load).

Dairy Plants

Solutions of HTH® dry chlorinator provide an effective, economical method of sanitizing processing equipment and problem areas in dairy plants.

To prevent contamination of the product, apply HTH solutions to every surface it will touch.

Pressure Method of Sanitizing Equipment: The pressure (or flow) method is commonly used to sanitize closed systems, such as fluid milk cooling and handling equipment. It's also appropriate for sanitizing weigh tanks, coolers, short time pasteurizers, pumps, homogenizers, fillers, sanitary piping and fittings, and bottle and can fillers.

First, clean all equipment thoroughly, immediately after it's used. Then place back in operating position.

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HTH® DRY CHLORINATOR FOR FOOD HANDLING EQUIPMENT

Prepare sufficient volume of an HTH solution containing 200 ppm available chlorine to fill the equipment. Allow a 10% excess for waste.

Pump the HTH solution through the system until it is filled and all air is excluded. Close final drain valves and hold under pressure for two minutes to insure proper contact with all surfaces. Then drain the solution and flush with potable water.

Spray Method of Sanitizing Equipment: The spray (or fog) method is generally used to sanitize large, non-porous surfaces that have already been freed of physical soil. It is appropriate for batch pasteurizers, holding tanks, weigh tanks, tank trucks and cars, vats, tile walls, ceilings and floors.

Prepare an HTH solution containing 200 ppm available chlorine. If possible, use pressure spraying or fogging equipment designed to resist hypochlorite solutions (e.g. rubber-coated, plastic or stainless steel). When using any other kind of spraying equipment, be sure to empty and rinse thoroughly with fresh water immediately after treatment.

Apply spray or fog heavily to all surfaces the product will touch. All treated surfaces, corners and turns should be thoroughly sprayed. Allow excess solution to drain off, rinse with fresh water, then place in service.

General Disinfection: HTH solutions containing 1000 ppm available chlorine will sanitize plant floors, walls and ceilings, and also control odors in refrigerated areas and drain platforms.

Flush or swab surfaces generously with the HTH solution. After two minutes, hose or rinse all metal surfaces with fresh water.

Controlling Mold & Mildew: HTH solutions containing 5000 ppm available chlorine will destroy mold and non-residual mildew that often grows in cheese-aging rooms, storage rooms and other areas.

Brush or spray all walls, floors, ceilings and shelves with the HTH solution. Then rinse all metal surfaces immediately, to prevent corrosion.

Poultry Plants

Solutions of HTH® dry chlorinator will control odors and bacterial growth in poultry feeding and dressing plants.

Regular treatment with HTH solutions containing 5000 ppm available chlorine will sanitize poultry feeding areas, dropping boards, feeding troughs and watering fountains.

Dropping boards and feeding troughs should be sprayed or flushed thoroughly with the HTH solution.

All watering fountains should be rinsed with this solution.

In float control fountains, treat poultry drinking water with 1 ounce of HTH dry chlorinator for every 1000 to 5000 gallons of water by using a gravity feeder.

In refillable fountains, add 1 ounce of HTH dry chlorinator for every 1000 to 5000 gallons of poultry drinking water.

Poultry dressing areas should be cleaned regularly before treatment. Immediately after cleaning, spray the walls, tables, floors and ceilings with solutions of HTH dry chlorinator containing 5000 ppm available chlorine.

All cleaned equipment and utensils should be rinsed with HTH solutions containing 200 ppm available chlorine. After a contact period of two minutes, rinse all metal surfaces with clear water. For other surfaces, allow to drain or air dry before

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Fish Processing Plants

Solutions of HTH® dry chlorinator will control the growth of bacteria and microorganisms that often occur in fish processing plants.

Before treating with the HTH solution, scrub all surfaces thoroughly with hot water and washing powder to remove all soil.

Smooth Surfaces: HTH solutions containing 300 to 500 ppm available chlorine will sanitize smooth wood, metal or synthetic surfaces (new boxes, new tabletops, conveyor belts or machines). Wash surfaces with the HTH solution for two to five minutes. Wait two minutes, then rinse surface with fresh water.

Rough Surfaces: HTH solutions containing 1000 to 5000 ppm available chlorine will sanitize rough surfaces (worn tables, old boxes, concrete floors and walls). Wash surfaces with the HTH solutions for two to five minutes. Wait two minutes, then rinse surfaces with fresh water.

Sugar Refineries

General Sanitization: Solutions of HTH® dry chlorinator containing 500 ppm available chlorine will properly sanitize floors, pipes, tanks and other problem areas in sugar refineries.

All areas needing treatment should be rinsed and flushed with the HTH solution. Then rinse with potable water before exposing to edible products.

Sugar Bags: HTH solutions can eliminate certain types of bacteria on sugar bags that mere washing cannot. Proper use of HTH dry chlorinator during the washing process will thoroughly sanitize and deodorize sugar bags.

Prepare an HTH solution containing 1% available chlorine. Stir in ¾ pound of soda ash for each pound of HTH dry chlorinator and allow to settle.

Add this solution slowly to the bag washer. Five minutes after application, test for available chlorine. A chlorine residual of 50 ppm should remain in the wash water. If not, add more solution, wait five minutes and test again, until a residual of 50 ppm is indicated.

Restaurant Utensils

Solutions of HTH® dry chlorinator containing 100 ppm available chlorine will kill bacteria on dishes, glasses and other eating utensils.

Fresh HTH solutions should be prepared each morning and as frequently as necessary during the day. Cold or warm water may be used. The solution should never be allowed to fall below 50 ppm available chlorine.

Small quantities of this solution can be prepared by adding 1 level teaspoon of HTH dry chlorinator to 5 gallons of water, or 1 level tablespoon of HTH dry chlorinator to 15 gallons of water. (Be sure to use a spoon that is completely dry and clean.) For larger quantities, consult Table 1 in the next section.

Before treatment, clean all utensils thoroughly. Then immerse them in the HTH solution.

How to Prepare Solutions of HTH® Dry Chlorinator*

Each of the applications listed above requires a specific concentration of solution, measured in parts per million (ppm)

*Stock solutions should be freshly prepared and kept in properly labeled containers to protect

or percent of available chlorine. To prepare the proper strength solution follow these three simple steps:

1. Determine the volume[b] of the holding tank (in cubic feet or cubic inches).
2. Find the capacity of the tank in gallons. If the volume has been determined in cubic feet, use Formula (1). If the volume is in cubic inches, use Formula (2).
   (1) Gallons = 7.48 x Volume in cubic feet
   (2) Gallons = .0043 x Volume in cubic inches
3. Use Tables 1 or 2 to determine how many ounces of HTH dry chlorinator must be added to the number of gallons of water to obtain the required ppm or percent of available chlorine. (Never add HTH dry chlorinator to anything but water.) If the volume of water you're using does not appear in Tables 1 or 2 you may calculate between values.

Table 1

Required Amounts of HTH® Dry Chlorinator* (Pounds-Ounces)

Available Chlorine (ppm)	Water (Gallons)				
	10	50	100	500	1,000
100	0-3/10	0-1	0-2	0-11	1-5
200	0-6/10	0-2	0-4	1-5	2-10
300	0-9/10	0-3	0-6	2-0	3-15
400	0-12/10	0-4	0-9	2-10	5-4
500	0-1	0-6	0-11	3-4	6-8
1,000	0-2	0-11	1-5	6-8	13-0
5,000	0-11	3-5	6-8	32-10	65-3

Table 2

Required Amounts of HTH® Dry Chlorinator (Pounds-Ounces)

Available Chlorine (%)	Water (Gallons)				
	1	5	10	50	100
1	0-2	0-11	1-5	6-8	13-0

*For convenience in measuring small quantities 2 teaspoons of granular HTH equals approximately ¾ ounce.

Storage and Handling

Store in a cool, dry, well ventilated place away from combustible materials, and avoid contamination with any foreign material. Protect against physical damage. Drums may rupture if exposed to heat.

[b]Volume of a rectangular tank: V = Length x Width x Height
Volume of a circular tank: V = 3.142 x Radius x Radius x Height
or
V = 0.785 x Diameter x Diameter x Height

Toxicological Properties

The acute oral LD_{50} (rat) is 850 mg/kg. The acute dermal LD_{50} (rabbit) is greater than 2 g/kg. The acute inhalation LC_{50} is less than 20 mg/l and greater than 2 mg/l of inspired air for one hour (rat). HTH® dry chlorinator is corrosive to the skin and eyes. It was not found to be a mutagen in the Ames assay and is not known to be a carcinogen.

Personnel Protection

HTH® dry chlorinator is easy to handle and use. As with any chemical, however, certain precautions should be taken. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Do not take internally. Wear goggles, coveralls and neoprene, rubber or PVC gloves and boots. Read label instructions before using product.

First Aid

Ingestion: Give bread soaked in milk, followed by large amounts of water. If person is conscious and vomiting, place face down with head lower than hips. Get immediate medical attention.

Skin Contact: Flush with water for 15 minutes. Call a physician.

Eye Contact: Flush with water for 15 minutes. Call a physician.

Inhalation: Remove victim to fresh air. Call a physician.

Spill and Leak Procedures

Remove all sources of ignition. Wear a NIOSH/MSHA approved dust and chlorine respirator. Follow OSHA regulations for respirator use. (See Title 29, Section 1910.134, *Code of Federal Regulations.*) Wear goggles, coveralls and rubber, neoprene or PVC gloves and boots. Clean up in a manner to minimize contamination with organic material. Do not return spilled material to original container. Place in a fresh container and isolate outside or in a well ventilated area. Do not seal the container. Flush any residual material with large quantities of water. In the event of a large spill call 203-356-2345.

Disposal

Dispose of unused product in a manner approved for this material. Consult appropriate Federal, state and local regulatory agencies to ascertain proper disposal procedures.

Shipping Information

HTH® dry chlorinator is available in granular or tablet form in 100 lb. fiber drums.

Technical Assistance

Technical assistance is available to facilitate your further investigation of HTH® dry chlorinator. If you have a question or need more information, please call or write your nearest Olin Sales Office.

Keep HTH® out of reach of children. Danger. See principal label for complete precautionary information and storage and handling.

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The use of HTH® dry chlorinator for the purposes described in this bulletin has been registered with the United States Environmental Protection Agency, but may not have been approved or registered for use or sale for such purposes in other countries. Olin Corporation assumes no responsibility for compliance with the laws of any country except the United States.

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