

Pesticides



The Calcium and Sodium Hypochlorite Salts

Pesticide Registration Standard Part I

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

The Calcium and Sodium Hypochlorite Salts

Pesticide Registration Standard

PART I

Michael F. Branagan	Project Manager (SPRD)
Bruce A. Kapner	Project Manager (SPRD)
James L. Skaptason	Section Head (SPRD)
Alex Arce	Pharmacologist (TB/HED)
William Boodee	Chemist (RCB/HED)
Barbara Breithaupt	Plant Physiologist (PSB/BFSD)
Linda Garczynski	Writer Editor (SPRD)
Robert Holst	Plant Physiologist (EEB/HED)
Steven Hopkins	Wildlife Biologist (EEB/HED)
Arturo Castillo	Product Manager (RD)
Russel Scarato	Economist (EAB/BFSD)
Arthur Schlosser	Environmental Chemist (EFB/HED)
Myra Smith	Microbiologist (PSB/BFSD)
Ann Stavola	Aquatic Biologist (EEB/HED)

December 31, 1982

Office of Pesticides and Toxic Substances

Environmental Protection Agency

401 M Street, SW

Washington, D.C. 20460

- TABLE OF CONTENTS -

	page
Chapter I Introduction.....	1
Purpose of this Standard	
Organization of the Standard	
Registration and Reregistration under Standards	
Simplified Registration Procedures	
Chapter II Regulatory Position and Rationale.....	5
Introduction	
Description of Chemical	
Regulatory Position	
Regulatory Rationale	
Acceptable Ranges and Limits	
Tolerance Reassessment	
Chapter III Registration and Reregistration under this.....	11
General Standard	
Introduction	
Registration under the General Registration Process	
Reregistration under the General Registration Process	
Registration and Reregistration of Products that are not being Processed under the General Registration Process	
Data Compensation	
Amendments to this Standard	
Compliance with an Amended Standard	
Reporting Production under Section 7 FIFRA	
Chapter IV Guide for Label Preparation	22
General Information	
Registration Number	
Establishment Number	
Product Name	
Type Size Requirements	
Storage and Disposal Statements	
Use Directions	
Standard Statements of Formula	
Standard Master Labels	
Sample Certification Statement	
Bibliography.....	89

CHAPTER I: INTRODUCTION

- A. Purpose of this Standard
- B. Organization of the Standard
- C. Registration and Reregistration under Standards
- D. Simplified Registration Procedures

A. Purpose of this Standard

The purpose of the hypochlorite registration standard is two fold. First, this standard is intended as a tool for the Environmental Protection Agency (the Agency) for the registration and reregistration of single active ingredient calcium and sodium hypochlorite pesticide products. Secondly, the purpose of this standard is to announce the introduction of the general registration process, a pilot program intended to streamline the registration/reregistration process.

B. Organization of the Standard

The standard for calcium and sodium hypochlorites will be published in two parts. This document is Part I, which includes all single active calcium and sodium hypochlorite products except those included in Part II. Part II includes all sodium hypochlorite products which contain intentionally added inerts such as detergents, soaps, and abrasives and typically are marketed as cleansers. These products typically do not possess Toxicity Category I eye irritation potential. The Agency has determined that these products are candidates for exemption under section 25(b) of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, (FIFRA) because they possess a very low hazard potential.

Part I of this standard combines, in one document, both a registration standard document and a guidance package and is physically divided into two sections: Chapters I and II present an overview of the standards process and Agency decisions, while Chapters III and IV provide an updated and expanded guidance package, necessary for the registration/reregistration of products containing these chemicals.

The first chapter introduces the concept and legal principles involved in registering or reregistering products under this standard. Chapter II presents the regulatory position and rationale for the position. The basis of the regulatory rationale is presented in a scientific appendix, available from the Agency upon request. Chapter III provides step-by-step instructions for registering and reregistering products under this standard and specifies the procedures to amend this standard. Chapter IV provides guidance on the preparation of products and labels. A bibliography of the references that form the data base supporting registrations under the standard appears after Chapter IV.

C. Registration and Reregistration under Standards

Section 3 of FIFRA, 1978, requires that anyone seeking to market a pesticide obtain the approval of the Agency prior to marketing, with approval contingent upon Agency evaluation of the results of scientific studies of the chemical under consideration and of the label proposed for the product.

In addition, FIFRA requires the Agency to prepare testing guidelines that provide guidance for adequate testing by current scientific and regulatory standards. Tests performed according to these guidelines permit the Agency to make uniform regulatory decisions on the registration of new products and reregistration of all existing pesticide products. Because many previously registered products relied upon testing which came to be considered inadequate by current testing standards, Congress, in 1972, directed the Agency to reassess and reregister all previously registered products, to bring their registrations and their data bases into compliance with current requirements. See FIFRA section 3(g).

To accomplish this reassessment and reregistration of the approximately 43,000 currently registered products, the Agency developed a three step process for each pesticide chemical. The steps are: identifying and reevaluating the relevant data on the active ingredient, documenting the results of the reevaluation, and reregistering the existing products based on the health and safety conclusions in the document. New products containing the pesticide would also be registered based on the conclusions from the review.

This document, called a registration standard, presents the Agency's reassessment of and basis for the registration and reregistration of products containing these chemicals. The document also serves as the basis for registration of new products that will be manufactured in accordance with the requirements of this standard.

All existing single active ingredient calcium and sodium hypochlorite products which are included in Part I must now be reregistered under the provisions of this standard.

D. Simplified Registration Procedures

Since the initiation of the registration standard process in 1977, the Agency has continuously sought ways to reduce both the processing time and costs associated with the registration of products subject to completed standards. As a result of that evaluation, the Agency has determined that the registration process can be simplified for some products, especially some end-use products with no significant loss in public or environmental protection. One outcome of this desire for simplification of the registration process is the development of the concept of the general registration. This concept is based on the belief that for some categories of chemicals and some use patterns, the development of standard labeling including uniform precautionary statements, and the setting of acceptable performance standards can provide an amount of public protection equivalent to product-by-product review.

The highlights of the general standard process are as follows:

- ° Under its provision applicants will be given a set of registrations for all applicable formulations of the pesticide product encompassed by a general registration standard upon Agency acceptance of properly completed certification(s) that the pesticide product(s) to be marketed is/are or will be in compliance with the testing and labeling requirements specified in the standard.

- ° The standard will include master labels for each acceptable formulation of the pesticide(s) included in the standard. Each master label will include all of the required precautionary labeling and all of the currently accepted use labeling for each formulation. A master label will cover a range of concentrations of the active ingredient for a particular formulation type, provided the precautionary labeling and range of acceptable uses does not vary within the range.
- ° Registrants will be permitted to market any number of individual products using all, or part, of the currently accepted uses from each registration granted under the provisions of a single general registration certification for each active ingredient.
- ° All products from an individual registrant using the same master label will bear the same registration number and be considered as a single registration. The registration number will be the company number followed by a code for the general registration standard label.
- ° The review of the certification(s) will be limited to confirmation that they are properly executed. Applicants will be sent a notification of Agency approval.
- ° The general registration process does not exempt registrants from other requirements of FIFRA, including the need for all registrants to report the production volume of all pesticides under section 7 of FIFRA, or adverse effects information under 6(a)2 FIFRA.

In the general registration process, the name and address required by FIFRA section 3(c)(1)(A) is specified in the certification. The generic name of the pesticide required by section 3(c)(1)(B) is specified in the certification. The requirement for a complete copy of the label, all claims, and directions for use specified by section 3(c)(1)(C) is satisfied by the standard labels presented in the standard. The tests required at the option of the Administrator of EPA by section 3(c)(1)(D) are provided by the studies listed in the bibliography of the incorporated standard. The complete formula of the pesticide, as required by section 3(c)(1)(E), is provided by the formula specified for each of the standard formulations, in Chapter IV of the incorporated standard and the Confidential Statements of Formula submitted by the applicant. The certification statement includes a request that all products be classified as required by section 3(c)(1)(F). The certification by the applicant that all required Offers-To-Pay have been delivered to the companies specified in Tables 1 and 2 in Chapter III will serve both as the submission of such offers to the Administrator and as evidence of delivery as required by section 3(c)(1)(D)(ii) of FIFRA.

While the Agency has not determined that this new approach is appropriate for all end-use products, the Agency has judged that this new approach is appropriate for Toxicity Category I products containing sodium or calcium hypochlorite as the sole active ingredient and therefore should be implemented at this time. The Agency is confident that the general standard approach will streamline the registration/reregistration process. The Agency strongly encourages registrants and applicants for registration of Toxicity Category I sodium and calcium hypochlorite products to utilize this streamlined process. In an effort to maintain flexibility during

this pilot effort, applicants will be permitted the option to register new Toxicity Category I products and reregister current Toxicity Category I products either by the new streamlined process or by the conventional registration process. Registrants of current products that are labeled as Toxicity Category II, III or IV must either supply the data specified in the standard to demonstrate the appropriate toxicity category or change their labeling to Toxicity Category I labeling. Registrants who change their labeling to Toxicity Category I may reregister by either the general registration or the conventional reregistration process. Registrants of current products who wish to maintain other than Toxicity Category I labeling must be registered and reregistered using the conventional registration/reregistration process and cannot utilize the general registration process.

To reduce any risks resulting from implementation of this new approach, the Agency will closely monitor early certifications to determine the degree of registrant compliance with the provisions of this document. Only if monitoring indicates a high degree of compliance will the Agency consider the process for widespread implementation. To facilitate the monitoring of this pilot effort, applicants for general registration will be required to submit labels and Confidential Statements of Formula for each different product. This information will be used to determine the degree of compliance. It will not be used in evaluating the registrant's application. At the end of this 18 month pilot effort, the Agency intends to evaluate the success of this effort and explicitly determine whether similar or more extensive (e.g. section 25(b) FIFRA) regulatory reforms are justified.

CHAPTER II: REGULATORY POSITION AND RATIONALE

- A. Introduction
- B. Description of Chemical
- C. Regulatory Position
- D. Regulatory Rationale
- E. Acceptable Ranges and Limits
- F. Tolerance Reassessment

A. Introduction

This chapter presents the Agency's regulatory position and rationale based on an evaluation of all registered products containing calcium or sodium hypochlorites as the sole active ingredient. Lithium hypochlorite, a third hypochlorite salt registered as a pesticide, is not considered within the scope of this standard because of the special toxicity/exposure problems encountered with lithium residues, resulting from certain of the chemical's registered uses.

All of the products subject to Part I of the standard can be divided into two groups. Group 1 includes all those products that are eligible to be registered under the general registration process. Group 2 includes all other hypochlorite products covered by Part I of the standard. Those will be reregistered on a case-by-case basis.

Group 1 includes a) liquid, sole active ingredient, calcium and sodium hypochlorite products with water as the only intentionally added inert ingredient, and b) solid, sole active ingredient, calcium hypochlorite products with a formula consistent with that on page 26 of this standard. Provided, that to be included in Group 1, all products must bear labeling consistent with the sample labels on pages 30-85 in this standard, and be in child-resistant packaging when appropriate. These products are subject to registration/reregistration under the general registration process.

Group 2 products will be handled outside of the general registration process. All products in this group will be registered/reregistered on a case-by-case basis. This group includes all calcium and sodium hypochlorite products where the applicant proposes changes from the labeling specified for Group 1 products. These include, for example, products for which Toxicity Category II, III, or IV^{1/} eye irritation labeling is proposed or those for which an exemption from the child-resistant packaging requirement is proposed.

B. Description of Chemicals

Calcium and sodium hypochlorites are chlorinated inorganic disinfectants. Calcium hypochlorite is principally sold as a solid, powder, granular, or tablet product, while sodium hypochlorite is normally sold only as a liquid.

^{1/} Toxicity Categories range from IV to I, with I representing the highest level of toxicity and/or irritability (40 FR 28279). Products which can result in any eye irritation that is irreversible within 21 days possess Toxicity Category I eye irritation potential. Such products must use DANGER as their signal word on the label. Such products must also be marketed in child-resistant packaging if used in the home environment (46 FR 15105).

Products containing 5 to 6 percent sodium hypochlorites are commonly known as household bleach.

Calcium and sodium hypochlorites are registered as sanitizers and disinfectants of surfaces, as disinfectants of water, and as chemicals to control microorganisms on certain foods and in certain industrial processes.

C. Regulatory Position

Based on a review of the available scientific data and other relevant information on the calcium and sodium salts of hypochlorites, the Agency has made the following determinations:

1. Applicability of the General Registration Process

- ° The use patterns and hazards are generally consistent among products and are well understood by both producers and users.
- ° There is sufficient information to classify most single active ingredient calcium and sodium hypochlorites products as general use products.
- ° The time and resources required for a product-by-product review would not afford additional public health protection commensurate with the additional time and resources required over the general registration approach for products in Group 1.
- ° Based on the above findings, general registration certifications will be accepted for all applicants seeking to market sodium or calcium hypochlorite as sole active ingredient pesticide products in Group 1.

2. Registration Status

- ° Products formulated and labeled in accordance with this standard will have a composition that warrants the proposed claims.
- ° The required certification, labeling, confidential statement of formula and other materials required to be submitted by FIFRA.
- ° Products formulated and labeled in accordance with this standard, when used in accordance with widespread and commonly recognized practice, will not generally cause unreasonable adverse effects on the environment.

3. Other Findings

- ° After reviewing the human hazard data for calcium and sodium hypochlorite, the Agency has determined that child-resistant packaging (44 FR 13109) is required for all end-use products for which Category I eye irritation toxicity labeling is appropriate, if labeled for use in the home environment. Products labeled with directions that they may only be

purchased and applied by a "service person" are not required to use child-resistant packaging.^{2/}

D. Regulatory Rationale

After a review of the available product chemistry and toxicity data, the Agency has determined that all calcium and sodium hypochlorite single active ingredient products are eye irritants whose potential for hazard from use of these products may be mitigated with appropriate precautionary labeling.

Based on a review of the available product chemistry, toxicity, environmental fate, and ecological effects data on calcium and sodium hypochlorites, the Agency has determined that any hazards associated with the uses of calcium and sodium hypochlorite are relatively small, when used in accordance with the label directions set forth in this standard.

Exposure to residues remaining on food contact surfaces, to chlorine contained in solutions, and to vapors from undiluted or diluted products will be small when the applicator follows required labeling and use directions. These labeling requirements are specified in Chapter IV of this standard. Exposure to the undiluted product will be small, and are primarily limited to the time required to dilute the concentrated product. Exposure to use dilutions of calcium and sodium hypochlorite is very small, despite their widespread use, because they are used at such low concentrations.

The Agency has determined that the available toxicity and exposure information is sufficient to evaluate the risks associated with the uses of calcium and sodium hypochlorites. The Agency has further determined that these risks are not unreasonable. In light of the determination of acceptable risk, the Agency has concluded that it should continue registration of calcium and sodium hypochlorite under the conditions set forth in this standard.

The Agency has decided not to perform a full ecological effects hazard assessment of the currently accepted uses that result in point source discharges of effluents treated with calcium and sodium hypochlorites. This decision is based on the premise that facilities which discharge large quantities of treated effluent will, in all likelihood, be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit. Such permits are tailored to a specific site or point of discharge and are usually required in situations which could result in large and prolonged effects on the environment. Small discharges, by contrast, normally do not require NPDES permits because their effects are usually localized and transitory in nature.

^{2/} A service person is defined as one who provides a service of controlling pests without delivering any unapplied pesticide to any person so served. The term "service person" includes, but is not limited to, a janitor, pest control operator, maintenance person, lawncare and landscape personnel. "Service person" does not include a household servant, such as maid, housekeeper, or private gardener (46 FR 15105).

Finally, the Agency has determined that the required hazard labeling, specified in this standard, is sufficient to minimize the likelihood of significant of significant discharges of effluents containing calcium and sodium hypochlorite.

All environmental fate data requirements for the hypochlorite salts have been fulfilled by the document, "Ambient Water Quality Criteria for Chlorine" (Tobler et al., MRID GS0029026), published by the Environmental Protection Agency.

The Agency has decided to continue its current policy of exempting Group 1 and Group 2 formulations of hypochlorites from the product-by-product efficacy data requirement normally levied on sanitizers and disinfectants. The Agency has concluded that the published literature data can reasonably be extrapolated to the full range of Group 1 and Group 2 products.

E. Acceptable Ranges and Limits

1. Product Composition Standard

a. Solid Formulations

The Agency will permit marketing of solid manufacturing-use and end-use calcium hypochlorite products at concentrations up to 70 percent active ingredient (A.I.), as declared on the label.

b. Liquid Formulations

The Agency will permit marketing of manufacturing-use and end-use liquid hypochlorite products containing either calcium or sodium hypochlorite at concentrations up to 12.5 percent A.I., as declared on the label.

Because of the inherent instability of liquid formulations of calcium and sodium hypochlorites, manufacturers of a liquid hypochlorite product are permitted to overformulate their products up to 25 percent above the label declaration. Overformulation will assure that the concentration of active ingredient, as declared on the label, will be present in the product for a reasonable period of time after manufacture. Therefore, products which declare 12.5 percent A.I., the maximum upper limit for liquid hypochlorite products, may contain an absolute upper limit of 15.6 percent A.I. To calculate the upper and lower limits of A.I. for your product use the following formula:

$$\% \text{ A.I. declared on label} \times 1.25 = \text{A.I. Upper Limit}$$

$$\% \text{ A.I. declared on label} = \text{A.I. Lower Limit}$$

EXAMPLE: The ABC Chemical Corporation has a registered product with a label declaration of 10 percent A.I. The product must contain between 10.0 and 12.5 percent A.I.

$$10.0 \times 1.25 = 12.5 \text{ A.I. Upper Limit}$$

$$10.0 = 10.0 \text{ Upper Limit}$$

2. Acute Toxicity Limits

a. Toxicity Category I products

Products which fall into Toxicity Category I, based on eye irritation potential, will be acceptable under a general registration certification.

b. Other Products

The Agency recognizes that eye and skin irritation data may exist which could place some products in a Toxicity Category other than I. In addition, many products have been registered in the past, in the absence of data or using data unacceptable by current standards, with precautionary labeling indicating an eye irritation potential other than Toxicity Category I. Based on the information reviewed to date, the Agency has determined that products which claim lesser eye irritation potential must be judged individually, using data developed for the actual formulated product. All applicants currently claiming an eye irritation potential other than that designated in Toxicity Category I must either (1) change their labeling to the Toxicity Category I labeling specified in chapter IV and be subject to the provisions of this standard or (2) submit all data specified in Chapter III and be considered for registration/reregistration under this standard on a product-by-product basis.

3. Use Pattern Limits

Under this standard, the Agency will permit marketing of end-use products labeled for use as:

- ° sanitizers of surfaces (e.g. wooden butcher blocks, stainless steel tops, concrete floors, tile walls); or
- ° sanitizers of commercial and household laundry; or
- ° agents to wash or assist in lye peeling of fruits and vegetables (sodium hypochlorite only); or
- ° agents to help control microorganisms on mushrooms (pins), potatoes, sweet potatoes (postharvest), pimento and tomato seeds, pecans, fish fillets, refining sugar (calcium hypochlorite only); or
- ° agents to help control microorganisms on eggs for human consumption; or
- ° disinfectants of poultry drinking water; or
- ° disinfectants of human drinking water (emergency/public/individual), swimming pool water, hubbard/immersion tank water, spas/hot tub, hydrotherapy pools, human drinking water systems (e.g. water mains); or
- ° disinfectants of nonporous hard surfaces (e.g. tile, glass, stainless steel, fibreglass); or

- ° agents to help control microorganisms in sewage, wastewater, industrial and pulp and paper process water systems; or
- ° algicides/slimicides in cooling towers or evaporative condensers; or
- ° sanitizers of dialysis machines; or
- ° sanitizers of toilet bowls; or
- ° agents to help control algae and bacteria in fish and lobster ponds/tanks and conditioning oysters; or
- ° agents to help control slime on boat bottoms; or
- ° agents to sanitize and deodorize artificial sand beaches; or
- ° agents to kill scavenger fish in fish hatchery ponds.

Under this standard, the Agency will permit marketing of manufacturing-use only products labeled for formulation into end-use products for any of the above uses. Manufacturing-use products may not be marketed as an end-use product. End-use products cannot be marketed for reformulation into other end-use products.

F. Tolerance Reassessment

An exemption from the requirement for a tolerance was established (40 CFR 180.1054) for residues of calcium hypochlorite which may occur in or on raw agricultural commodity potatoes resulting from the use of washing solutions containing calcium hypochlorite. After reexamining the exemption from the requirement for a tolerance, the Agency has determined that the exemption is still appropriate under current scientific standards.

Food processing plants, dairies, canneries, breweries, wineries, beverage bottling plants and eating establishments use hypochlorites for sanitizing premises and for disinfecting equipment and utensils. A food additive regulation allowing the use of sodium or calcium hypochlorites as a terminal sanitizing rinse on food processing equipment has been established (21 CFR 178.1010). A food additive regulation permitting the use of sodium hypochlorites in washing or assisting in lye peeling of fruits and vegetables has been established (21 CFR 173.315) by the Food and Drug Administration (FDA).

The provisions of the Food Drug and Cosmetic Act (40 CFR 180.1001 (a)) require the establishment of a exemption for a tolerance for the use of calcium hypochlorite on mushroom pins (pre-harvest), sweet potatoes (post harvest), pimento seeds, tomato seeds, pecans (post harvest), fish fillets. An exemption for the requirement of a tolerance will be pursued by the Agency for these uses.

The provisions of the Food Drug and Cosmetic Act (21 CFR 173 Subpart D - Specific Usage Additives) require the establishment of a food additive regulation for calcium hypochlorite in sugar syrup and raw sugar. The Agency has informed the appropriate registrants that a food additive regulation must be obtained from the FDA for these uses to remain acceptable.

CHAPTER III: REGISTRATION AND REREGISTRATION UNDER THIS STANDARD

- A. Introduction
- B. Registration under the General Registration Process
- C. Reregistration under the General Registration Process
- D. Registration and Reregistration of Products that are not being Processed under the General Registration Process
- E. Data Compensation
- F. Amendments to this Standard
- G. Compliance with an Amended Standard
- H. Reporting Production under Section 7 FIFRA

A. Introduction

This chapter is intended to provide applicants with the procedures for registering and reregistering products containing either calcium or sodium hypochlorites as the sole active ingredient.

Section B provides the procedures to be followed for the registration of all new products subject to the general registration process. Section C provides the procedures for reregistering the existing products subject to the general registration process. Section D provides the procedures for registering or reregistering all other sole active ingredient sodium or calcium hypochlorite products except those to be covered under Part II of the standard. Section E discusses the data compensation implications of registration and reregistration under this standard.

Section F provides procedures for amending the standard to expand the formulations and uses of Hypochlorites beyond those approved in this standard. Section G details the procedural requirements for expanding marketing under a general registration certificate to include new formulations and uses approved in an amended standard. Finally, Section H discusses the obligations of registrants to report production under the provisions of FIFRA Section 7.

- ° To register a new product using the general registration process, turn to Section B of this chapter.
- ° To reregister a currently registered product using the general registration process, turn to Section C of this chapter.
- ° To register a new product outside of the general registration process, turn to Section D of this chapter.
- ° To reregister a current product outside of the general registration process, turn to Section D of this chapter.
- ° Applicants seeking to amend this standard should turn to Section F of this chapter.

All submissions for reregistrations must be sent to:

Product Manager 32
Disinfectants Branch
Registration Division (TS-767)
The United States Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460
(703) 557-3965

All submissions for new registrations must be sent to:

Process Coordination Branch
Registration Division (TS-767)
The United States Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460
(703) 557-7700

B. Registration under the General Registration Process

THIS SECTION IS ONLY APPLICABLE TO APPLICANTS SEEKING TO MARKET NEW SODIUM OR CALCIUM HYPOCHLORITE SOLE ACTIVE INGREDIENT PRODUCTS IN GROUP 1. ALL PRODUCTS MEETING THIS TEST MAY BE REGISTERED UNDER THE GENERAL REGISTRATION PROCESS. FOR A DISCUSSION OF THE GROUPINGS, SEE CHAPTER II, PAGE 5.

A single general registration application provides a separate registration for each general formulation type and includes all acceptable uses for each formulation, as specified in the master labels. Registrants may market under labels bearing all uses or selected uses without additional approval by the Agency.

Applicants for new registrations must:

- ° obtain a company number from the Agency if none is currently assigned (See Chapter IV),
- ° obtain an establishment number from the Agency for the facilities where the product(s) are to be manufactured (See Chapter IV),
- ° notify all data submitters cited in Table 1 or Table 2 on pages 18 and 19, as appropriate, that you will enter into negotiations to provide compensation for data supporting your registrations to the extent required in the footnote to the tables (See also Section E below).
- ° submit separate general registration certification(s) for calcium hypochlorite and/or sodium hypochlorite (See Chapter IV, Section J below),
- ° submit finished printed labeling for each different product to be marketed, prior to marketing^{3/}

^{3/} During this pilot effort, five copies of each finished printed label must be submitted to the product manager specified above. Each different label used must be submitted to the Agency. These labels must be submitted to the Agency on or before the first shipment of products bearing the new label. These labels will be used only to evaluate the pilot effort. No premarket review and clearance of the labels will be performed by the Agency.

- ° submit a completed Confidential Statement of Formula (EPA Form 8570-4), prior to marketing.^{4/}

Based on the findings in this standard, the applicant is granted a final general registration by the Agency under the provisions of FIFRA section 3(c)(5), upon notification by the Agency of the approval. This general registration permits a registrant to distribute, sell, offer for sale, hold for sale, ship, deliver for shipment, or receive and (having so received) deliver or offer to deliver any product in compliance with the general registration provisions of this standard.

If you do not comply with these conditions after the registrations are issued, the registrations will be subject to cancellation in accordance with FIFRA section 6(b)(1).

All certifications and other submissions must be sent to the addresses specified in Section A of this chapter.

Proceed directly to Section E and the remaining sections of this chapter.

C. Reregistration under the General Registration Process

THIS SECTION IS ONLY APPLICABLE TO APPLICANTS SEEKING TO CONTINUE MARKETING CURRENTLY REGISTERED CALCIUM OR SODIUM HYPOCHLORITE SOLE ACTIVE INGREDIENT PRODUCTS IN GROUP 1. ALL PRODUCTS MEETING THIS TEST MAY BE REGISTERED UNDER THE GENERAL REGISTRATION PROCESS. FOR A DISCUSSION OF THE GROUPINGS, SEE CHAPTER II, PAGE 5.

This general registration application provides a separate registration for each general formulation type and includes all acceptable uses for each formulation, as specified in the master labels. Registrants may market their products under labels bearing all uses or selected uses without additional approval by the Agency.

Applicants with current registrations must:

- ° notify all data submitters cited in Table 1 or Table 2, as appropriate, that that you will enter into negotiations to provide compensation for data supporting your registrations to the extent required in the footnote to the tables (See also Section E below).
- ° submit within 90 days, a separate general registration certification for each different calcium hypochlorite and/or each different sodium hypochlorite product (See Chapter IV, Section J below),

^{4/} A completed Confidential Statement of Formula (EPA Form 8570-4) for each product must be submitted to the Agency. These completed forms must be submitted to the Agency on or before the first shipment of products using the new formula. The confidential statements of formula will be reviewed over the life of the pilot effort to assess their value. No premarket review and clearance of the Confidential Statements of Formula will be performed prior to issuance of the registration.

- ° submit within 90 days, a crosswalk of old registration numbers and new general registration numbers (See Chapter IV, Section J below),
- ° submit a completed Confidential Statement of Formula (EPA Form 8570-4), prior to marketing.^{4/}
- ° submit new labels that comply with this standard within one year from the date of publication of this standard, and thereafter, ship only under the new labels.

If you do not comply with these conditions, the registration will be subject to cancellation in accordance with FIFRA section 6(b)(1).

All certifications and other submissions must be sent to the addresses specified in Section A of this chapter.

Products will be reregistered upon approval of the certification by the Agency.

D. Registration and Reregistration of Products that are being Processed Under the General Registration Process

THIS SECTION IS ONLY APPLICABLE TO APPLICANTS SEEKING TO REGISTER OR REREGISTER SODIUM OR CALCIUM HYPOCHLORITE SOLE ACTIVE INGREDIENT PRODUCTS IN GROUP 2. FOR A DISCUSSION OF THE GROUPINGS, SEE CHAPTER II, PAGE 5.

Applicants seeking to register a new product must:

- ° obtain a company number from the Agency if none is currently assigned (See Chapter IV),
- ° obtain an establishment number from the Agency for the facilities where the product(s) are to be manufactured (See Chapter IV),
- ° submit a completed Application for Registration (EPA Form 8570-1),
- ° submit a completed Confidential Statement of Formula (EPA Form 8570-4),
- ° submit a certification Statement (EPA Form 8570-21) and an Offer-to-Pay Statement (EPA Form 8570-23),
- ° notify all data submitters cited in Table 1 or Table 2, as appropriate, that you will enter into negotiations to provide compensation for data supporting your registrations to the extent required in the footnote to the tables (See also Section E below).
- ° identify the Toxicity Category proposed for the product, as indicated on draft labeling to be submitted with the application. Finished printed labeling must be submitted after the Agency has determined that the claimed labeling is appropriate.),
- ° submit data according to the specifications of this Section.

All forms may be obtained from either the Regional Offices of EPA or Process Coordination Branch (TS-767), at EPA Headquarters, Registration Division, Office of Pesticide Programs, 401 M Street, S.W., Washington, D.C. 20460.

Turn directly to Subsection 1 "Required Testing", below, for testing specifications.

Registrants seeking to reregister existing products must, within 90 days:

- ° notify all data submitters cited in Table 1 or Table 2, as appropriate, that you will enter into negotiations to provide compensation for data supporting your registrations to the extent required in the footnote to the tables (See also Section E below),
- ° submit an agreement to submit the product chemistry and toxicity data specified below, in Subsection 1, and for each product,
- ° submit a completed Application for Amendment (EPA Form 8570-1),
- ° submit a Confidential Statement of Formula (EPA Form 8570-4),
- ° submit a Certification Statement (EPA Form 8570-21) and an Offer-to-Pay Statement (EPA Form 8570-23),

Registrants seeking to reregister existing products must, within 9 months:

- ° submit product chemistry and toxicology data according to the specifications of this Section.
- ° submit three copies of the label for the product proposed for re-registration.

Finished printed labeling must be submitted after the Agency has determined that the proposed labeling is appropriate.

All forms may be obtained from either the Regional Offices of EPA or Process Coordination Branch (TS-791) at EPA Headquarters, Registration Division, Office of Pesticide Programs, 401 M Street, S.W., Washington, D.C., 20460.

Registrants with products currently registered may continue to use their existing labeling, until the Agency has evaluated the submitted studies, and validated the previously approved label.

The Agency may suspend the registration of your product(s) containing sodium or calcium hypochlorites unless, within the specified time, you have informed the Agency how you will satisfy the requirements of this standard. Any such suspension under FIFRA section 3(c)(2)(B) will remain in effect until you have complied with the terms of this standard. The effects of such a suspension, issued under FIFRA section 3(c)(2)(B), are clearly different from those of suspensions under FIFRA section 6. A section 3 suspension remains in effect only while noncompliance continues. A section 6 suspension, on the other hand, precedes cancellation proceedings.

1. Required Testing for New Products

The following studies must be performed for products with other than Toxicity Category I precautionary labeling. All studies must be conducted on the actual product which will appear in the marketplace. Studies may not be conducted on a product made specifically for these tests which will differ from the product which will be marketed. These tests must be conducted on the actual product which has been identified by a unique sample number. The same sample must be used for all product chemistry and toxicity tests. The sample number must appear in conjunction with the results from each test.

a. Product Chemistry Data

A completed Confidential Statement of Formula (EPA Form 8570-4) must be submitted to the Agency. The results of the following tests must be submitted to the Agency, in addition to the information requested in the directions for the confidential statement of formula form: specific gravity, titration for available chlorine, pH, and concentration of excess free alkali^{5/}.

Products must also be tested for storage stability for a period of 60 days. These products must be tested in the same type of container which will be used in channels of trade. Storage conditions, such as temperature, humidity, exposure, to sunlight, must be similar to the conditions typically experienced by this product during shipping and storage. The following analysis must be performed at day zero, day 30 and day 60 on products tested for storage stability: specific gravity, titration for available chlorine, pH and concentration of excess free alkali.

b. Toxicity Data

A primary eye irritation and a primary skin irritation study must be submitted to the Agency for all products claiming a Toxicity Category other than I. The toxicity tests must be conducted according to the proposed Guidelines (43 FR 37359-37361), except as modified below (46 FR 15105).

- ° Eye irritation test will be evaluated and categories assigned based on a 21-day observation period. Reversibility of effects will be considered in categorizing products for eye irritation. This policy modifies the previous categorization criteria based on a 7-day observation period.
- ° Dermal irritation testing will be conducted on intact skin only for a period of 4 hours, or longer depending on certain conditions of expected patterns of human use and exposure. This policy modifies the previous Guidelines testing on intact and abraded skin for a period of 24 hours.

c. Physical/Chemical Hazard Data

Solid calcium hypochlorite products which claim less stringent physical/chemical hazards than prescribed by the standard labels must submit data to justify such claims. Registrants should submit a protocol for testing of the physical/chemical hazard potential of their products if less stringent labeling is proposed. Registrants are cautioned NOT to initiate testing until the Agency has reviewed and approved the test protocol. Registrants should contact the Product Manager for guidance.

^{5/} Specific gravity, pH determination, and concentration of free alkali applies to liquid calcium and sodium hypochlorite products only. Titration analysis applies to both solid and liquid products

2. Required Testing for Existing Products

All of the data specified in Section 1, above, must be submitted. However, the Agency will consider on a case-by-case basis the use of previously submitted or bridging data that fulfill the intent of Section 1, above.

All submissions must be sent to the address specified in section A above.

E. Data Compensation

Section 3(c)(1)(D)(ii) of FIFRA provides that with regard to data submitted after December 31, 1969, by an applicant in support of an application, the Administrator cannot consider such data in support of a second applicant's application for fifteen years after the original submission without the second applicant having made an offer to compensate the first submitter and submitted such offer to the Administrator accompanied by evidence of delivery of the offer to the original data submitter.

Paragraph 3(c)(2)(D) provides that "No Applicant for registration of a pesticide who proposes to purchase a registered pesticide from another producer in order to formulate such purchased pesticide into an end-use product shall be required to - (i) submit or cite data pertaining to the safety of such purchased product; or (ii) offer to pay reasonable compensation otherwise provided for by paragraph (1)(D) of this subsection for the use of any such data." This provision is commonly referred to as the "formulators' exemption".

In addition the regulations implementing FIFRA provide for specific procedures once a standard, such as this one, has been published (40 CFR 162.9-3). Of special importance is subsection (c) which requires that after a standard is completed every application must include an acknowledgement that the application relies on all data which, according to the standard, supports the registrability of each use for which registration is sought.

The primary source of data for this standard is published literature, which is not compensable. In two areas however, data was used which meets the criteria specified above and is, therefore, potentially compensable.

The first area is ecological effects. The ecological effects data were submitted after December 31, 1969, in support of an application. The data are required for all registered uses of calcium or sodium hypochlorites. Therefore, these data are potentially subject to the provisions of the formulators' exemption.

The second area of potentially compensable data is acute toxicity. These data are required to determine the acute toxicity of the active ingredients in manufacturing-use products and as such are also potentially subject to compensation. The Agency has further determined that the acute toxicity data required to determine the toxicity of the active ingredients are sufficient and that no additional data need be required to evaluate the toxicity of most individual products. Therefore these data are also potentially subject to the formulators' exemption.

TABLE 1 SODIUM HYPOCHLORITE DATA CITATIONS*

DATA SOURCE	TEST CATEGORY	MRID	AUTHOR	TOXICITY CATEGORY 1 PRODUCTS	TOXICITY CATEGORY 2, 3, or 4 AQUEOUS PRODUCTS	TOXICITY CATEGORY 2, 3, OR 4 SEMI-LIQUID PRODUCTS
Jones Chemical Company Caledonia, N.Y. 14423	Acute oral and dermal	000007374	Baker, 1976	X	X	
	Eye and skin irritation	000007374	Baker, 1976	X		
	Acute oral and dermal	000007369	Paa, 1977	X	X	
	Eye and skin irritation	000007369	Paa, 1977	X		
Allied Chlorine and Chemical Products, Inc. Miami, Fla.	Acute oral and dermal	000007285	Paa, 1977	X	X	
	Skin and eye irritation	000007285	Paa, 1977	X		
Kushner Chemical Company Linden, N.J. 07036	Acute oral	000007274	WARP, 1977	X	X	
	Acute dermal	000007277	WARP, 1978	X	X	
	Skin and eye irritation	000007274	WARP, 1977	X		
	Quail dietary LC50	000007275	Beavers, 1978	X	X	X
	Duck dietary LC50	000007278	Beavers, 1978	X	X	X
	Quail acute oral LD50	000007276	Beavers, 1978	X	X	X
	Bluegill LC50	000008190	Calmbacher, 1978	X	X	X
	Trout LC50	000008191	Calmbacher, 1978	X	X	X
	Daphnia LC50	000007279	Morrissey, 1978	X	X	X
	Acute oral	000007399	Rabish, 1978	X	X	
The Chlorine Institute New York, N.Y. 10173	Acute oral	000007397	Rabish, 1978	X	X	
	Acute dermal	000007398	Rabish, 1978	X	X	
	Skin irritation	000008203	Rabish, 1978	X		
	Skin irritation	000008205	Rabish, 1978	X		
	Eye irritation	000008204	Rabish, 1978	X		
	Eye irritation	000008206	Rabish, 1978	X		
	Quail dietary LC50	000007405	Beavers & Brown, 1978	X	X	X
	Duck dietary LC50	000007404	Beavers et al., 1978	X	X	X
	Quail acute oral LD50	000007403	Beavers et al., 1978	X	X	X
	Bluegill LC50	000007401	Ruccafusco et al., 1978	X	X	X
	Trout LC50	000007400	Stiefel et al., 1978	X	X	X
	Daphnia LC50	000007402	LeBlanc and Sutrenant, 1978	X	X	
	Skin and eye irritation	000007221	Latven, 1976	X		
Sinclair Mfg. Comp. Carson, Calif.	Acute oral and dermal	000020072	Drube, 1978	X	X	
Surpass Chemical Co. New York	Skin and eye irritation	000020072	Drube, 1978	X		
Folino Industries Winoski, Vt. 05404	Acute oral and dermal	000007540	N. England Testing, 1977	X	X	
PMC Corporation Philadelphia, Pa.	Skin and eye irritation	000007540	N. England Testing, 1977	X		
	Daphnia LC50	000019313	Leblanc, 1977	X	X	X

* These data need not be cited by applicants who certify that they are eligible for the formulators' exemption (see Section G).

TABLE 2 CALCIUM HYPOCHLORITE DATA CITATIONS*

DATA SOURCE	TEST CATEGORY	MRID	AUTHOR	TOXICITY CATEGORY 1 PRODUCTS	TOXICITY CATEGORY 2, 3, or 4 PRODUCTS
Olin Corporation Stamford, Conn. 06904	Acute inhalation	000007560	Lavenhar & Palanker, 1975	X	
	Acute oral and dermal	000007381	Palanker, 1975	X	
	Acute oral and inhalation	000007580	Goldhammer, 1973	X	
	Skin and eye irritation	000007580	Goldhammer, 1973	X	
	Skin and eye irritation	000007381	Palanker, 1975	X	
	Skin irritation	000008202	Baker, 1974	X	
	Quail acute oral LD50	000007496	Beavers, 1976	X	X
	Trout LC50	000007495	Ruccafusco & LeBlanc, 1977	X	X
	Daphnia LC50	000007495	Ruccafusco & LeBlanc, 1977	X	X
	Skin and eye irritation	000007248	Latven, 1976	X	
Pennwalt Chemical Corp.	Eye irritation	000007249	Latven, 1976	X	

* These data need not be cited by applicants who certify that they are eligible for the formulators' exemption (see Section G).

Applicants subject to the formulators' exemption, who must submit additional studies, are not required to cite or offer to pay compensation for the existing studies of the types they are submitting. This is not necessary because the Agency has concluded that some of the existing studies of the type being replaced are not relevant to their products. Tables 1 and 2 show the data that must be cited for each kind of product. They are required to offer compensation for the studies which they do not repeat.

Current Agency policy exempts simple formulations of hypochlorites from the product-by-product efficacy data requirements for sanitizers and disinfectants. The Agency has determined that there is sufficient published information on the efficacy of the available chlorine in the products to support the omission of efficacy data review for these chemicals and, thus, continue this exemption policy. The basis of this decision lay in the characteristics and history of use of these chemicals and because the labels specify dosages, which are measurable in the use dilutions by readily available test kits for active chlorine. Thus, a waiver of efficacy review for these chemicals will not significantly affect the public health provided that label directions are properly followed by the applicator.

F. Amendments to this Standard

All new formulations outside currently accepted ranges and limits and/or uses not specifically approved in this standard must be approved by the Agency prior to marketing. The procedure for seeking such approval is by formal application to amend this standard. After the standard is modified to expand the range of accepted uses, registrants are permitted to market products labeled for such uses under the revised standard subject to any limitations specified in the amended standard. Applicants will be notified directly when an amendment is accepted.

Applications for amendments to the standard should be submitted in the form of a letter to the Agency. The letter should specify the part of the standard that is proposed for modification, proposed text for modification and the justification (including data, if appropriate). The letter should be sent to the product manager at the address specified in Section B of this chapter.

G. Compliance with an Amended General Standard

When an amendment to the standard is accepted, all holders of general registrations are free to modify existing labels or initiate new products in compliance with the revisions without notifying the Agency, as provided in their general registration, provided they comply with any new requirements of the amended standard. Whenever an amendment to the standard is granted on the basis of potentially compensable data, all registrants seeking to add the changes to their registrations will be required to submit an amended certification. This amended certification will confirm the appropriate offers-to-pay have been made. When the Agency initiates changes in existing labeling or product composition limits, the amendment will specify the terms and conditions of the change, including the schedule for compliance.

All new labels must be submitted to the Agency. These will not be used to evaluate the application. They are needed by the Agency to evaluate the pilot effort.

As the standard is amended, registrants with registrations under previous editions must comply with the newer amendments to the standard, in order to continue to legally market their products. Compliance with an amended standard, though, may require some action by a registrant (e.g. submission of data, reprinting of labels to remove a disallowed use) or no action at all (e.g. when amendments permit optional new uses where no compensation is involved).

Registrants will not be required to reprint their labels upon issuance of every amendment to the standard. Rather, the Agency will require mandatory reprinting of labels in only very limited circumstances (e.g. evidence of adverse effects, revocation of tolerances, etc.). Generally, most amendments to the standard will add versatility to their current registration(s) (new uses, tolerances, exemptions from the requirement for a tolerance, etc.) and will allow, but not necessarily require, reprinting of labels, provided the registrant complies with any new provisions of the amended standard. Registrants should consult the Product Manager for questions on reprinting of labels arising from an amended standard.

H. Reporting of Production under Section 7 of FIFRA

Section 7 of FIFRA and the regulations in 40 CFR 167.1 through 167.5 require that all production volume of pesticides registered under this standard must be reported to the Agency. Production volume is requested from individuals or companies who are registered as establishments which produce a pesticide, as opposed to an individual or company which has registered products. The production volume is requested in this fashion because some registrants may not produce their own pesticides, but have another individual or company produce their product.

Pesticide producers must report production volume within 30 days of its receipt of its EPA Establishment Number and annually, thereafter. Generally, the production volume reporting forms (EPA Form 3540-16) will automatically be mailed to all producers with an EPA Establishment number. Producers are required to report production annually, regardless of whether a pesticide is produced by the registered establishment. Registrants and applicants unfamiliar with reporting requirements should contact their EPA Regional Office for further details on reporting of production under section 7 of FIFRA.

Chapter IV: GUIDE FOR LABEL PREPARATION

- A. General Information
- B. Registration Numbers
- C. Establishment Numbers
- D. Product Name
- E. Type Size Requirements
- F. Storage and Disposal Statements
- G. Use Directions
- H. Standard Statement of Formula
- I. Standard Master Labels
- J. Sample Certification Statement

A. General Information

All calcium or sodium hypochlorite products subject to this standard must comply with the labeling requirements specified in this Chapter. These requirements are intended to assure that each label contains accurate, complete and sufficient instructions and precautions which reflect the scientific data for that product and its ingredients. These requirements also incorporate terminology and label formatting which are sufficiently standardized to avoid confusion to both the manufacturer and the user of the product.

Certain labeling statements (e.g. signal word, child hazard statement and ingredient statement) must appear at fixed locations on the label, a concept known as Format Labeling. Format Labeling does, though, allow discretionary placement of the first aid statement and all other precautionary label statements, use directions and claims, provided a referral statement (e.g. "See Additional Precautions on Side Panel" or "See Additional Precautions on Back Panel") appears on the label. Applicants must customize the standard labels for registration number, establishment number, product name, type size, container disposal statement, and use directions as specified in Sections B through G, respectively.

Section H provides standard labels for all existing formulations of calcium or sodium hypochlorites as sole active ingredients. These labels incorporate all of the format requirements.

Bulletins, leaflets, circulars, brochures, data sheets, flyers and other graphic printed matter referenced on the label and/or distributed in connection with the product are termed collateral labeling and also must be consistent with this general standard.

Finally, applicants should note that while the standard specifies the minimum label statements that must appear on the label, it does not forbid the inclusion of nonpesticidally related text on the label. Applicants are only prohibited from placing any other pesticidally-related language on the label without prior Agency review and approval (through the process of amending the standard - See Chapter III, Section F). If claims appear on the label as nonpesticidal claims and are found by the Agency to be pesticidally related, they are subject to the enforcement provisions of FIFRA. The inclusion of pesticidally-related language on the label which

has not been reviewed and approved by the Agency is a deviation from the stipulated language of the standard and may subject the registrant to the misbranding provisions of the FIFRA (section 12(a)(1)(E)). For the purposes of this section, pesticidally-related language means all statements, designs, or graphic representations relative to the products' use as a pesticide. The term also applies to any statements, designs, or graphic representations concerning the safety of the product or its ingredients whether or not these claims are related to its pesticidal use.

B. Registration Numbers

The registration number assigned to the pesticide product must appear on the label, preceded by the phrase "EPA Reg. No." or "EPA Registration No.". The registration number must be set in type of a size and style similar to other print on that part of the label on which it appears and must run parallel to it. The registration number must not appear in such a manner as to suggest or imply recommendation or endorsement of the product by the Agency (see 40 CFR 162.10).

The Agency has determined that its method for assigning this number will differ for general registrations from the previous method. The registration number has, in the past, been composed of two parts, a unique company number followed by a unique product number. Under the new system, a company number will remain unique, but all companies using the same standard label will use the same product number. A list of standard labels and their corresponding product numbers is presented in Section I of this chapter. In addition, the sample labels show the correct product number.

All products not registered or reregistered the general registration process will continue to use individual registration numbers.

C. Establishment Number

The EPA establishment number, preceded by "EPA Est.", is the final establishment at which the product was produced, and may appear in any suitable location on the label or immediate container. It must also appear on the wrapper or outside container of the package if the EPA establishment number on the immediate container cannot be clearly read through such wrapper or container (see 40 CFR 162.10).

New applicants must request an establishment number by completing EPA form number 3540-8. If this form was not attached to this registration standard, it may be obtained by phone request from either the Regional Offices of EPA or Process Coordination Branch (TS-767), at EPA Headquarters, Registration Division, Office of Pesticide Programs, 401 M Street, S.W., Washington, D.C., 20460 at (703)-557-7700. The procedures for applying for the establishment number are provided on the reverse of the form.

Applicants who will not produce their own product(s), but contract with another company to manufacture product(s), need only obtain a company number by the method outlined above. The producer who actually manufactures the product must, however, comply with the provisions for obtaining an EPA establishment number outlined above. An establishment number must appear on the product. The establishment number which must appear on the product is that of the company manufacturing the product.

D. Product Name

The top center panel of the standard labels is reserved for the product name. A product is misbranded if "it is an imitation of, or is offered for sale under the name of another pesticide" FIFRA 2(q)(1)(C). In this context, Use of the word "chlorine" alone or in combination with other wording in the name or label text to describe products other than liquified chlorine is misbranding of a product and a violation of section 2(q)(1)(A) FIFRA, as amended, and section 162.10(a)(5)(vii) of the regulations. All labels with such wording must be corrected in accordance with the timetable for submission of labels specified in this standard.

The following examples are considered acceptable alternatives:

UNACCEPTABLE

Dry Chlorine

Liquid Chlorine

Dry Granular Chlorine

Chlorine Tablets

ACCEPTABLE

Dry Chlorinating (Chemical, Compound, or Product)

Liquid Chlorinating (Chemical, Compound, or Product)

Dry Granular Chlorinating (Chemical, Powder or Product)

Chlorinating Tablets

Any product failing to satisfy the above requirements within the timetables established in this standard (See Section C and D in Chapter III) will be considered misbranded and subject to enforcement proceedings.

E. Type Size Requirements

The signal word and the statement, "Keep out of reach of children", must appear on the front panel in accordance with the type size requirements prescribed below (see 40 CFR 162.10). Labeling regulations now being drafted require a minimum 8 point (3 mm) type size for all print on a label. When the final guidelines are published, the below list may be modified accordingly.

Size of Label on Front Panel in Square Inches	Signal Word As Required Minimum Type Size All Capitals	"Keep out of Reach of Children" As Required
5 and under	6 point	6 point
above 5 to 10	10 point	6 point
above 10 to 15	12 point	8 point
above 15 to 30	14 point	10 point
over 30	18 point	12 point

F. Storage and Disposal Statements

All labels are required to bear storage and disposal statements. These statements are developed for specific containers, sizes, and chemical content. These instructions must be grouped and appear under the heading STORAGE AND DISPOSAL in the directions for use. This heading must be set in the same type size as required for the child hazard warning. Registrants should note that minor modifications of the following statements are permitted to tailor the statements to a particular type of container used by the manufacturer.

Manufacturers are required to use the storage and disposal statements on the standard labels in this standard for all solid and liquid products, except as specified below.

Manufacturing-Use Products

Manufacturers of hypochlorite manufacturing-use products who register under this standard must include the following statements on their labels, under the heading of STORAGE AND DISPOSAL.

Store this product in a cool dry area, away from direct sunlight and heat to avoid deterioration. In case of spill, flood areas with large quantities of water. Product or rinsates that cannot be used should be diluted with water before disposal in a sanitary sewer. Do not contaminate food or feed by storage, disposal or cleaning of equipment.

Large metal containers should be rinsed thoroughly with water and returned to manufacturer for reconditioning or discarded in an approved landfill. Large storage containers should be thoroughly washed with water before reuse.

End-Use Products

The following statements are appropriate for all liquid end-use products containing either calcium or sodium hypochlorite registered under this standard.

Store this product in a cool dry area, away from direct sunlight and heat to avoid deterioration. In case of spill, flood areas with large quantities of water. Product or rinsates that cannot be used should be diluted with water before disposal in a sanitary sewer. Do not contaminate food or feed by storage, disposal or cleaning of equipment.

Manufacturers of liquid hypochlorite end-use products must include the following statements on their label, under the heading of STORAGE AND DISPOSAL. Modifications of this statement are permitted to tailor this statement to a particular type of container used by the manufacturer.

Rinse empty container thoroughly with water and either return to manufacturer or discard by placing this container in trash collection or burying in an approved landfill.

G. Use Directions

The standard labels presented in Section I specify the full range of use directions currently accepted for a formulation. Applicants may delete, but not add, whole uses from these labels.

Applicants seeking to market for new uses must apply to amend the standard using the procedures outlined in Chapter III. New uses cannot be incorporated into a label until notification that the change is acceptable and the standard has been amended.

The standard labels are intended to serve a range of actual percentages of active ingredient. The ranges of active ingredient are specified in a list at Section H. The use dilutions in the directions of the standard labels are specific for the percentages of A.I. for that particular label. Registrants with products containing different concentrations of A.I. must adjust the dosages with the following formula:

$$\text{OZ. OF PRODUCT} = \frac{\text{ppm avail. chlorine} \times \# \text{ gal. water} \times 128 \text{ oz./gal.}}{\% \text{ A.I.} \times 10,000}$$

$$\text{EXAMPLE: } 128 \text{ oz.} = \frac{500 \times 100 \times 128}{5.00 \times 10,000}$$

H. Standard Statement of Formula

Products marketed under a general registration must have a formula consistent with the following standard formulae:

1. Calcium Hypochlorite

a. Solid Products Up to 70 Percent Active Ingredient (-20001)

Ingredient	Range of Percentages
Active Ingredient	
Calcium Hypochlorite	Up to 75.0
Inert Ingredients	
Calcium Hydroxide	Up to 10.0
Sodium or Calcium Carbonate	} Up to 65.0
Sodium or Calcium Bicarbonate	
Sodium or Calcium Sulfate	
Sodium or Calcium Chloride	
Binders/Mold release agents (for tablets)	Up to 5.0
Water	Up to 10.0

b. Liquid Products Up to 12.5 Percent Active Ingredient (-20002)

Ingredient	Range of Percentages
Active Ingredients	
Calcium Hypochlorite	Up to 15.60
Inert Ingredients	
Water	Up to 84.40
Calcium Hydroxide	Up to 2.0
Calcium Carbonate	Up to 0.5
Calcium Chloride	Up to 0.5
Other Inorganic Salts	Up to 0.5

2. Sodium Hypochlorite Up to 12.5 Percent Active Ingredient (-20003)

Ingredient	Range of Percentages
Active Ingredient	
Sodium Hypochlorite	Up to 15.60
Inert Ingredients	
Water	Up to 84.40
Sodium Hydroxide	Up to 2.0
Sodium Carbonate	Up to 0.5
Sodium Chloride	Up to 12.5
Other Inorganic Salts	Up to 0.5

All inert ingredients must of a purity which is suitable for its intended use for products bearing directions for use on food, food contact surfaces, drinking water, swimming pool water, hydrotherapy/spa/hot tub water, hubbard/immersion bath water.

Perfumes and detergents are inappropriate in swimming pool products.

I. Standard Master Labels

1. Introduction

This section provides sample labels for all currently acceptable pesticide products containing sodium or calcium hypochlorite as the sole active ingredient.

All products must bear labeling consistent with these standard labels in both content and format. The labels must be customized by individual applicants as specified in Sections B through F of this Appendix. It is very important to note that the use directions in the standard labels have been tailored to the two widely used percent A.I.'s: 70 and 12.5. Products with a percent A.I. which differs from that used in a standard label must calculate the correct dosage (see Section G, Chapter IV) to obtain the required parts per million (ppm) of available chlorine.

2. List of Labels

The current list of standard labels for calcium or sodium hypochlorite as sole active ingredients is presented in Table 3, followed by all of the labels listed in the Table. Applicants with products that fall within specifications stated in Table 3 should go directly to the label at the referenced page number.

3. Labeling Flexibility

Applicants are advised that the label directions which follow Table 3 are generic in nature and are not intended to list every specific registered site of these chemicals. The label directions are written in this fashion because many apparently dissimilar sites can be functionally identified as part of a larger single group. For example, a generic site such as non-porous hard surfaces includes a multiplicity of specific surfaces (tile floors and walls, sinks, toilet bowls, etc.) that fall under this generic classification but are too numerous to list in a single label (See Chapter II, Section E).

In the interests of flexibility, the Agency will permit manufacturers to alter use directions to indicate the specific surfaces that will be treated with their product. Thus, the applicant and registrant is permitted to alter the use directions of the master standard labels in two ways: (1) alter the dosages to allow for a product that differs in concentration from the standard label and (2) add specific surfaces to be treated. You should contact the Product Manager if questions arise about the directions for use.

TABLE 3

INDEX TO AND DESCRIPTION OF STANDARD LABELS

PRODUCT #	CHEMICAL	% A.I.	FORM	TOX.CAT.	PAGE
End-Use Products					
-20001	Calcium Hypochlorite	Up to 70	Solid	I	30
-20002	Calcium Hypochlorite	Up to 12.5	Liquid	I	46
-20003	Sodium Hypochlorite	Up to 12.5	Liquid	I	62
Manufacturing-Use Products					
-20004	Calcium Hypochlorite	Up to 70	Solid	I	77
-20005	Calcium Hypochlorite	Up to 12.5	Liquid	I	80
-20006	Sodium Hypochlorite	Up to 12.5	Liquid	I	83

PRODUCT NAME

ACTIVE INGREDIENT:

Calcium Hypochlorite.....70%

INERT INGREDIENTS:.....35%

KEEP OUT OF REACH OF CHILDREN

DANGER

STATEMENT OF PRACTICAL TREATMENT (FIRST AID)^{6/}

IF CONTACT WITH EYES OCCURS, flush with cold water for at least 15 minutes. Get medical attention.

IF CONTACT WITH SKIN, brush off excess chemical and flush skin with cold water for at least 15 minutes. If irritation persists, get medical attention.

IF SWALLOWED, feed bread soaked in milk, followed by olive oil or cooking oil. DO NOT induce vomiting. Call a physician immediately.

(See additional precautions on side panel.)

Manufactured by:
ABC Chemical Corporation
P.O. Box 99
New York, New York
99999

EPA REG NO. 10237-20001
NET CONTENTS:

EPA EST 10237-KS-1

^{6/} It is only suggested that First Aid statements be placed on the front panel. If placed on another panel (e.g. the back panel), the label must have the referral statement, "See other precautions on back panel".

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER: Highly corrosive. Causes skin and eye damage. May be fatal if swallowed. Do not get in eyes, on skin or on clothing. Wear goggles or safety glasses and rubber gloves when handling this product. Irritating to nose and throat. Avoid breathing dust. Remove and wash contaminated clothing before reuse.

ENVIRONMENTAL HAZARDS

This product is toxic to fish. Do not discharge into lakes, streams, ponds or public waterways unless in accordance with a NPDES permit. For guidance, contact the regional office of the U.S. Environmental Protection Agency.

PHYSICAL OR CHEMICAL HAZARDS

STRONG OXIDIZING AGENT: Mix only with water. Use clean dry utensils. Do not add this product to any dispensing device containing remnants of any other product. Such use may cause a violent reaction leading to fire or explosion. Contamination with moisture, organic matter or other chemicals will start a chemical reaction and generate heat, chlorine gas (and possible fire and explosion). In case of contamination or decomposition, do not reseal container. If possible, isolate container in open air or well ventilated area. Flood area with large volumes of water, if necessary.

DIRECTIONS FOR USE

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

STORAGE AND DISPOSAL

Keep this product dry in a tightly closed container, when not in use. Store in a cool, dry, well ventilated area away from heat or open flame. In case of decomposition, isolate container (if possible) and flood area with large amounts of water to dissolve all material before discarding this container. Do not reuse empty container but place in trash collection. Do not contaminate food or feed by storage, disposal, or cleaning of equipment.

SWIMMING POOL WATER DISINFECTION

For a new pool or spring start-up, superchlorinate with 10 to 20 oz. of product for each 10,000 gallons of water to yield 5 to 10 ppm available chlorine by weight. Check the level of available chlorine with a test kit. Adjust and maintain pool water pH to between 7.2 to 7.6. Adjust and maintain the alkalinity of the pool to between 50 to 100 ppm.

To maintain the pool, add manually or by a feeder device 2 oz. of this product for each 10,000 gallons of water to yield an available chlorine residual between 0.6 to 1.0 ppm by weight. Stabilized pools should maintain a residual of 1.0 to 1.5 ppm available chlorine. Test the pH, available chlorine residual and alkalinity of the water frequently with appropriate test kits. Frequency of water treatment will depend upon temperature and number of swimmers.

Every 7 days, or as necessary, superchlorinate the pool with 10 to 20 oz. of product for each 10,000 gallons of water to yield 5 to 10 ppm available chlorine by weight. Check the level of available chlorine with a test kit. Do not reenter pool until the chlorine residual is between 1.0 to 3.0 ppm.

At the end of the swimming pool season or when water is to be drained from the pool, chlorine must be allowed to dissipate from treated pool water before discharge. Do not chlorinate the pool within 24 hours prior to discharge.

WINTERIZING POOLS - While water is still clear & clean, apply 0.6 oz. of product per 1000 gallons, while filter is running, to obtain a 3 ppm available chlorine residual, as determined by a suitable test kit. Cover pool, prepare heater, filter and heater components for winter by following manufacturers' instructions.

SPAS, HOT-TUBS, IMMERSION TANKS, ETC.

SPAS/HOT-TUBS - Apply 0.5 oz. of product per 500 gallons of water to obtain a free available chlorine concentration of 5 ppm, as determined by a suitable chlorine test kit. Adjust and maintain pool water pH to between 7.2 and 7.8. Some oils, lotions, fragrances, cleaners, etc. may cause foaming or cloudy water as well as reduce the efficiency of the product.

To maintain the water, apply 0.5 oz. of product per 500 gallons of water over the surface to maintain a chlorine concentration of 5 ppm.

After each use, shock treat with 1.5 oz. of this product per 500 gallons of water to control odor and algae.

During extended periods of disuse, add 1.5 oz. of product daily per 500 gallons of water to maintain a 3 ppm chlorine concentration.

HUBBARD AND IMMERSION TANKS - Add 0.5 oz. of this product per 100 gallons of water before patient use to obtain a chlorine residual of 25 ppm, as determined by a suitable test kit. Adjust and maintain the water pH to between 7.2 and 7.6. After each use drain the tank. Add 0.5 oz. to a bucket of water and circulate this solution through the agitator of the tank for 15 minutes and then rinse out the solution. Clean tank thoroughly and dry with clean cloths.

HYDROTHERAPY TANKS - Add 1 oz. of this product per 1000 gallons of water to obtain a chlorine residual of 1 ppm, as determined by a suitable chlorine test kit. Pool should not be entered until the chlorine residual is below 3 ppm. Adjust and maintain the water pH to between 7.2 and 7.6. Operate pool filter continuously. Drain pool weekly, and clean before refilling.

SANITIZATION OF NONPOROUS FOOD CONTACT SURFACES

RINSE METHOD - A solution of 100 ppm available chlorine may be used in the sanitizing solution if a chlorine test kit is available. 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 by thoroughly mixing 1 oz. of this product with 40 gallons of water. If no test kit is available, prepare a sanitizing solution by thoroughly mixing 1 oz. of this product with 20 gallons of water to provide approximately 200 ppm available chlorine by weight.

Clean equipment surfaces in the normal manner. 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 reestablish a 200 ppm residual. Do not rinse equipment with water after treatment and do not soak equipment overnight. Sanitizers used in automated systems may be used for general cleaning but may not be re-used for sanitizing purposes.

IMMERSION METHOD - A solution of 100 ppm available chlorine may be used in the sanitizing solution if a chlorine test kit is available. 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 by thoroughly mixing 1 oz. of this product with 40 gallons of water. If no test kit is available, prepare a sanitizing solution by thoroughly mixing 1 oz. of this product with 20 gallons of water to provide approximately 200 ppm available chlorine by weight.

Clean equipment 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 reestablish a 200 ppm residual. Do not rinse equipment with water after treatment.

Sanitizers used in automated systems may be used for general cleaning but may not be re-used for sanitizing purposes.

FLOW/PRESSURE METHOD - Disassemble equipment and thoroughly clean after use. Assemble equipment in operating position prior to use. Prepare a volume of a 200 ppm available chlorine sanitizing solution equal to 110 % of volume capacity of the equipment by mixing the product in a ratio of 1 oz. product with 20 gallons of water. Pump solution through the system until full flow is obtained at all extremities, the system is completely filled with the sanitizer and all air is removed from the system. Close drain valves and hold under pressure for at least 2 minutes to insure contact with all internal surfaces. Remove some cleaning solution from drain valve and test with a chlorine test kit. Repeat entire cleaning/sanitizing process if effluent contains less than 50 ppm available chlorine. Rinse system with potable water prior to use.

CLEAN-IN-PLACE METHOD - Thoroughly clean equipment after use. Prepare a volume of a 200 ppm available chlorine sanitizing solution equal to 110 % of volume capacity of the equipment by mixing the product in a ratio of 1 oz. product with 20 gallons of water. Pump solution through the system until full flow is obtained at all extremities, the system is completely filled with the sanitizer and all air is removed from the system. Close drain valves and hold under pressure for at least 10 minutes to insure contact with all internal surfaces. Remove some cleaning solution from drain valve and test with a chlorine test kit. Repeat entire cleaning/sanitizing process if effluent contains less than 50 ppm available chlorine. Rinse system with potable water prior to use.

SPRAY/FOG METHOD - Preclean all surfaces after use. Use a 200 ppm available chlorine solution to control bacteria, mold or fungi and a 600 ppm solution to control bacteriophage. Prepare a 200 ppm sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 1 oz. product with 20 gallons of water. Prepare a 600 ppm solution by thoroughly mixing the product in a ratio of 3 oz. product with 20 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. Thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours. Prior to using equipment, rinse all surfaces treated with a 600 ppm solution with a 200 ppm solution.

SANITIZATION OF POROUS FOOD CONTACT SURFACES

RINSE METHOD - Prepare a sanitizing solution by thoroughly mixing 3 oz. of this product with 20 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 3 oz. of this product with 20 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment in the

normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Rinse equipment with water after treatment.

SPRAY/FOG METHOD - Preclean all surfaces after use. Prepare a 600 ppm available chlorine sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 3 oz. product with 20 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. Thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours. Prior to using equipment, rinse all surfaces with a 200 ppm available chlorine solution. Prepare a 200 ppm sanitizing solution by thoroughly mixing 1 oz. of this product with 20 gallons of water.

SANITIZATION OF NONPOROUS NON-FOOD CONTACT SURFACES

RINSE METHOD - Prepare a sanitizing solution by thoroughly mixing 1 oz. of this product with 20 gallons of water to provide approximately 200 ppm available chlorine by weight. Clean equipment surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 1 oz. of this product with 20 gallons of water to provide approximately 200 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

SPRAY/FOG METHOD - Preclean all surfaces after use. Prepare a 200 ppm available chlorine sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 1 oz. product with 20 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Prior to using equipment, thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours.

DISINFECTION OF NONPOROUS NON-FOOD CONTACT SURFACES

RINSE METHOD - Prepare a disinfecting solution by thoroughly mixing 3 oz. of this product with 20 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the disinfecting solution, maintaining contact with the solution for at least 10 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a disinfecting solution by thoroughly mixing, in an immersion tank, 3 oz. of this product with 20 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the disinfecting solution for at least 10 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

SANITIZATION OF POROUS NON-FOOD CONTACT SURFACES

RINSE METHOD - Prepare a sanitizing solution by thoroughly mixing 3 oz. of this product with 20 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 3 oz. of this product with 20 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

SPRAY/FOG METHOD - After cleaning, sanitize non-food contact surfaces with 600 ppm available chlorine by thoroughly mixing the product in a ratio of 3 oz. of this product with 20 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. prior to using equipment, thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours.

SEWAGE & WASTEWATER EFFLUENT TREATMENT

The disinfection of sewage effluent must be evaluated by determining the total number of coliform bacteria and/or fecal coliform bacteria, as determined by the Most Probable Number (MPN) procedure, of the chlorinated effluent has been reduced to or below the maximum permitted by the controlling regulatory jurisdiction.

On the average, satisfactory disinfection of secondary wastewater effluent can be obtained when the chlorine residual is 0.5 ppm after 15 minutes contact. Although the chlorine residual is the critical factor in disinfection, the importance of correlating chlorine residual with bacterial kill must be emphasized. The MPN of the effluent, which is directly related to the water quality standards requirements, should be the final and primary standard and the chlorine residual should be considered an operating standard valid only to the extent verified by the coliform quality of the effluent.

The following are critical factors affecting wastewater disinfection.

1. **Mixing:** It is imperative that the product and the wastewater be instantaneously and completely flash mixed to assure reaction with every chemically active soluble and particulate component of the wastewater.
2. **Contacting:** Upon flash mixing, the flow through the system must be maintained.
3. **Dosage/Residual Control:** Successful disinfection is extremely dependent on response to fluctuating chlorine demand to maintain a predetermined, desirable chlorine level. Secondary effluent should

contain 0.2 to 1.0 ppm chlorine residual after a 15 to 30 minute contact time. A reasonable average of residual chlorine is 0.5 ppm after 15 minutes contact time.

SEWAGE AND WASTEWATER TREATMENT

EFFLUENT SLIME CONTROL - Apply a 100 to 1000 ppm available chlorine solution at a location which will allow complete mixing. Prepare this solution by mixing 2 to 20 oz. of this product with 100 gallons of water. Once control is evident, apply a 15 ppm available chlorine solution. Prepare this solution by mixing 0.3 oz. of this product with 100 gallons of water.

FILTER BEDS - SLIME CONTROL: Remove filter from service, drain to a depth of 1 ft. above filter sand, and add 16 oz. of product per 20 sq/ft evenly over the surface. Wait 30 minutes before draining water to a level that is even with the top of the filter. Wait for 4 to 6 hours before completely draining and backwashing filter.

DISINFECTION OF DRINKING WATER (EMERGENCY/PUBLIC/INDIVIDUAL SYSTEMS)

PUBLIC SYSTEMS: Mix a ratio of 1 oz. of this product to 6000 gallons of water. Begin feeding this solution with a hypochlorinator until a free available chlorine residual of at least 0.2 ppm and no more than 0.6 ppm is attained throughout the distribution system. Check water frequently with a chlorine test kit. Bacteriological sampling must be conducted at a frequency no less than that prescribed by the National Interim Primary Drinking Water Regulations. Contact your local Health Department for further details.

INDIVIDUAL SYSTEMS: - DUG WELLS Upon completion of the casing (lining) wash the interior of the casing (lining) with a 100 ppm available chlorine solution using a stiff brush. This solution can be made by thoroughly mixing 1 oz. of this product into 40 gallons of water. After covering the well, pour the sanitizing solution into the well through both the pipesleeve opening and the pipeline. Wash the exterior of the pump cylinder also with the sanitizing solution. Start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Contact your local Health Department for further details.

INDIVIDUAL WATER SYSTEMS: DRILLED, DRIVEN & BORED WELLS - Run pump until water is as free from turbidity as possible. Pour a 100 ppm available chlorine sanitizing solution into the well. This solution can be made by thoroughly mixing 1 oz. of this product into 40 gallons of water. Add 5 to 10 gallons of clean, chlorinated water to the well in order to force the sanitizer into the rock formation. Wash the exterior of pump cylinder with the sanitizer. Drop pipeline into well, start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Deep wells with high water levels may necessitate the use of special methods for introduction of the sanitizer into the well. Consult your local Health Department for further details.

INDIVIDUAL WATER SYSTEMS: FLOWING ARTESIAN WELLS Artesian wells generally do not require disinfection. If analyses indicate persistent contamination, the well should be disinfected. Consult your local Health Department for further details.

EMERGENCY DISINFECTION - When boiling of water for 1 minute is not practical, water can be made potable by using this product. Prior to addition of the sanitizer, remove all suspended material by filtration or by allowing it to settle to the bottom. Decant the clarified, contaminated water to a clean container and add 1 grain of this product to 1 gallon of water. One grain is approximately the size of the letter "O" in this sentence. Allow the treated water to stand for 30 minutes. Properly treated water should have a slight chlorine odor, if not, repeat dosage and allow the water to stand an additional 15 minutes. The treated water can then be made palatable by pouring it between clean containers for several times.

PUBLIC WATER SYSTEMS

RESERVOIRS - ALGAE CONTROL: Hypochlorinate streams feeding the reservoir. Suitable feeding points should be selected on each stream at least 50 yards upstream from the points of entry into the reservoir.

MAINS - Thoroughly flush section to be sanitized by discharging from hydrants. Permit a water flow of at least 2.5 feet per minute to continue under pressure while injecting this product by means of a hypochlorinator. Stop water flow when a chlorine residual test of 50 ppm is obtained at the low pressure end of the new main section after a 24 hour retention time. When chlorination is completed, the system must be flushed free of all heavily chlorinated water.

NEW TANKS, BASINS, ETC. - Remove all physical soil from surfaces. Place 4 oz. of this product for each 5 cubic feet of working capacity (500 ppm available chlorine). Fill to working capacity and allow to stand for at least 4 hours. Drain and flush with potable water and return to surface.

NEW FILTER SAND - Apply 16 oz. of this product for each 150 to 200 cubic feet of sand. The action of the product dissolving as the water passes through the bed will aid in sanitizing the new sand.

NEW WELLS - Flush the casing with a 50 ppm available chlorine solution of water containing 1 oz. of this product for each 100 gallons of water. The solution should be pumped or fed by gravity into the well after thorough mixing with agitation. The well should stand for several hours or overnight under chlorination. It may then be pumped until a representative raw water sample is obtained. Bacterial examination of the water will indicate whether further treatment is necessary.

EXISTING EQUIPMENT - Remove equipment from service, thoroughly clean surfaces of all physical soil. Sanitize by placing 4 oz. of this product for each 5 cubic feet capacity (approximately 500 ppm available chlorine). Fill to working capacity and let stand at least 4 hours. Drain and place in service. If the previous treatment is not practical, surfaces may be sprayed with a solution containing 1 oz. of this product for each 5 gallons of water (approximately 1000 ppm available chlorine). After drying, flush with water and return to service.

EMERGENCY DISINFECTION AFTER FLOODS

WELLS - Thoroughly flush contaminated casing with a 500 ppm available chlorine solution. Prepare this solution by mixing 1 oz. of this product with 10 gallons of water. Backwash the well to increase yield and reduce turbidity, adding sufficient

chlorinating solution to the backwash to produce a 10 ppm available chlorine residual, as determined by a chlorine test kit. After the turbidity has been reduced and the casing has been treated, add sufficient chlorinating solution to produce a 50 ppm available chlorine residual. Agitate the well water for several hours and take a representative water sample. Retreat well if water samples are biologically unacceptable.

RESERVOIRS - In case of contamination by overflowing streams, establish hypochlorinating stations upstream of the reservoir. Chlorinate the inlet water until the entire reservoir obtains a 0.2 ppm available chlorine residual, as determined by a suitable chlorine test kit. In case of contamination from surface drainage, apply sufficient product directly to the reservoir to obtain a 0.2 ppm available chlorine residual in all parts of the reservoir.

BASINS, TANKS, FLUMES, ETC. - Thoroughly clean all equipment, then apply 4 oz. of product per 5 cu. ft. of water to obtain 500 ppm available chlorine, as determined by a suitable test kit. After 24 hours drain, flush, and return to service. If the previous method is not suitable, spray or flush the equipment with a solution containing 1 oz. of this product for each 5 gallons of water (1000 ppm available chlorine). Allow to stand for 2 to 4 hours, flush and return to service.

FILTERS - When the sand filter needs replacement, apply 16 oz. of this product for each 150 to 200 cubic feet of sand. When the filter is severely contaminated, additional product should be distributed over the surface at the rate of 16 oz. per 20 sq. ft.. Water should stand at a depth of 1 foot above the surface of the filter bed for 4 to 24 hours. When filter beds can be backwashed of mud and silt, apply 16 oz. of this product per each 50 sq. ft., allowing the water to stand at a depth of 1 foot above the filter sand. After 30 minutes, drain water to the level of the filter. After 4 to 6 hours drain, and proceed with normal backwashing.

DISTRIBUTION SYSTEM - Flush repaired or replaced section with water. Establish a hypochlorinating station and apply sufficient product until a consistent available chlorine residual of at least 10 ppm remains after a 24 hour retention time. Use a chlorine test kit.

EMERGENCY DISINFECTION AFTER FIRES

CROSS CONNECTIONS OR EMERGENCY CONNECTIONS - Hypochlorination or gravity feed equipment should be set up near the intake of the untreated water supply. Apply sufficient product to give a chlorine residual of at least 0.1 to 0.2 ppm at the point where the untreated supply enters the regular distribution system. Use a chlorine test kit.

EMERGENCY DISINFECTION AFTER DROUGHTS

SUPPLEMENTARY WATER SUPPLIES - Gravity or mechanical hypochlorite feeders should be set up on a supplementary line to dose the water to a minimum chlorine residual of 0.2 ppm after a 20 minute contact time. Use a chlorine test kit.

WATER SHIPPED IN BY TANKS, TANK CARS, TRUCKS, ETC. - Thoroughly clean all containers and equipment. Spray a 500 ppm available chlorine solution and rinse with potable water after 5 minutes. This solution is made by mixing 1 oz. of this product for each 5 gallons of water. During the filling of the containers, dose with sufficient amounts of this product to provide at least a 0.2 ppm chlorine residual. Use a chlorine test kit.

EMERGENCY DISINFECTION AFTER MAIN BREAKS

MAINS - Before assembly of the repaired section, flush out mud and soil. Permit a water flow of at least 2.5 feet per minute to continue under pressure while injecting this product by means of a hypochlorinator. Stop water flow when a chlorine residual test of 50 ppm is obtained at the low pressure end of the new main section after a 24 hour retention time. When chlorination is completed, the system must be flushed free of all heavily chlorinated water.

COOLING TOWER/EVAPORATIVE CONDENSER WATER

SLUG FEED METHOD - Initial Dose: When system is noticeably fouled, apply 10 to 20 oz. of this product per 10,000 gallons of water in the system to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved.
Subsequent Dose: When microbial control is evident, add 2 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

INTERMITTENT FEED METHOD - Initial Dose: When system is noticeably fouled, apply 10 to 20 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown.

Subsequent Dose: When microbial control is evident, add 2 oz. of this product per 10,000 gallons of water in the system to obtain a 1 ppm residual. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown. Badly fouled systems must be cleaned before treatment is begun.

CONTINUOUS FEED METHOD - Initial Dose: When system is noticeably fouled, apply 10 to 20 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine.

Subsequent Dose: Maintain this treatment level by starting a continuous feed of 1 oz. of this product per 3,000 gallons of water lost by blowdown to maintain a 1 ppm residual. Badly fouled systems must be cleaned before treatment is begun.

BRIQUETTES OR TABLETS - Initially slug dose the system with 10 oz. of this product per 10,000 gallons of water in the system. Badly fouled systems must be cleaned before treatment is begun.

Subsequent Dose: When microbial control is evident, add 2 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

LAUNDRY SANITIZERS

Household Laundry Sanitizers

IN SOAKING SUDS - Thoroughly mix 1 Tbs. of this product to 10 gallons of wash water to provide 200 ppm available chlorine. Wait 5 minutes, then add soap or detergent. Immerse laundry for at least 11 minutes prior starting the wash/rinse cycle.

IN WASHING SUDS - Thoroughly mix 1 Tbs. of this product to 10 gallons of wash water containing clothes to provide 200 ppm available chlorine. Wait 5 minutes, then adding soap or detergent and start the wash/rinse cycle.

Commercial Laundry Sanitizers

Wet fabrics or clothes should be spun dry prior to sanitization. Thoroughly mix 1 oz. of this product with 20 gallons of water to yield 200 ppm available chlorine. Promptly after mixing the sanitizer, add the solution into the prewash prior to washing fabrics/clothes in the regular wash cycle with a good detergent. Test the level of available chlorine, if solution has been allowed to stand. Add more of this product if the the available chlorine level has dropped below 200 ppm.

FARM PREMISES

Remove all animals, poultry, and feed from premises, vehicles, and enclosures. Remove all litter and manure from floors, walls and surfaces of barns, pens, stalls, chutes and other facilities occupied or transverse by animals or poultry. Empty all troughs, racks and other feeding and watering appliances. Thoroughly clean all surfaces with soap or detergent and rinse with water. To disinfect, saturate all surfaces with a solution of at least 1000 ppm available chlorine for a period of 10 minutes. A 1000 ppm solution can be made by thoroughly mixing 2 oz. of this product with 10 gallons of water. Immerse all halters, ropes and other types of equipment used in handling and restraining animals or poultry, as well as the cleaned forks, shovels and scrapers used for removing litter and manure. Ventilate buildings, cars, boats and other closed spaces. Do not house livestock or poultry or employ equipment until chlorine has been dissipated. All treated feed racks, mangers, troughs, automatic feeders, fountains and waterers must be rinsed with potable water before reuse.

PULP AND PAPER MILL PROCESS WATER SYSTEMS

SLUG FEED METHOD - Initial Dose: When system is noticeably fouled, apply 10 to 20. oz. of this product per 10,000 gallons of water in the system to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved.

Subsequent Dose: When microbial control is evident, add 2 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

INTERMITTENT FEED METHOD - Initial Dose: When system is noticeably fouled, apply 10 to 20 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown.

Subsequent Dose: When microbial control is evident, add 2 oz. of this product per 10,000 gallons of water in the system to obtain a 1 ppm residual. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown. Badly fouled systems must be cleaned before treatment is begun.

CONTINUOUS FEED METHOD - Initial Dose: When system is noticeably fouled, apply 10 to 20 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine.

Subsequent Dose: Maintain this treatment level by starting a continuous feed of 2 oz. of this product per 1,000 gallons of water lost by blowdown to maintain a 1 ppm residual. Badly fouled systems must be cleaned before treatment is begun.

BRIQUETTES OR TABLETS - Initially slug dose the system with 10 oz. of this product per 10,000 gallons of water in the system. Badly fouled systems must be cleaned before treatment is begun.

Subsequent Dose: When microbial control is evident, add 2 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

AGRICULTURAL USES

POST-HARVEST PROTECTION - Potatoes can be sanitized after cleaning and prior to storage by spraying with a sanitizing solution at a level of 1 gallon of sanitizing solution per tons of potatoes. Thoroughly mix 1 oz. of this product to 10 gallons of water to obtain 500 ppm available chlorine.

Disinfect leafcutting bee cells and bee boards by immersion in a solution containing 1 ppm available chlorine for 3 minutes. Allow cells to drain for 2 minutes and dry for 4 to 5 hours or until no chlorine odor can be detected. This solution is made by thoroughly mix 1/4 Tsp. of this product to 200 gallons of water. The bee domicile is disinfected by spraying with a 0.1 ppm solution until all surfaces are thoroughly wet. Allow the domicile to dry until all chlorine odor has dissipated.

FOOD EGG SANITIZATION - Thoroughly clean all eggs. Thoroughly mix 1 oz. of this product with 20 gallons of warm water to produce a 200 ppm available chlorine solution. The sanitizer temperature should not exceed 130°F. Spray the warm sanitizer so that the eggs are thoroughly wetted. Allow the eggs to thoroughly dry before casing or breaking. Do not apply a potable water rinse. The solution should not be re-used to sanitize eggs.

FRUIT & VEGETABLE WASHING - Thoroughly clean all fruits and vegetables in a wash tank. Thoroughly mix 1 oz. of this product in 200 gallons of water to

make a sanitizing solution of 25 ppm available chlorine. After draining the tank, submerge fruit or vegetables for 2 minutes in a second wash tank containing the recirculating sanitizing solution. Spray rinse vegetables with the sanitizing solution prior to packaging. Rinse fruit with potable water only prior to packaging.

SEEDS - To control bacterial spot (*Xanthomonas vesticatoris*) on Pimento seeds, initially remove moist seeds from ripe fruits. To control surface fungi and bacteria on Tomato seeds initially wash seeds. Immediately soak seeds in 39,000 ppm solution for 15 minutes with continuous agitation. After treatment rinse seeds in potable water for 15 minutes. Dry seeds to normal moisture. The solution may be made by mixing 8 oz. of this product with 1 gallon of water.

MUSHROOMS - To control bacterial blotch (*Pseudomonas tolaasii*), use a 100 to 200 ppm solution prior to watering mushroom production surfaces. This solution may be made by mixing 0.2 to 0.4 oz. of this product with 10 gallons of water. First application should begin when pins form, and thereafter, between breaks on a need basis depending on the occurrence of bacterial blotch. This product may be applied directly to pins to control small infection foci. Apply 1.5 to 2.0 oz. per square foot of growing space.

POST-HARVEST ROOTS - To control and reduce the spread of soft rot causing organisms in water and on sweet potatoes (*Ipomoea batatas*), spray or dip the potatoes with a 150 to 500 ppm solution for 2 to 5 minutes. Thoroughly mix 0.3 to 1.0 oz. of this product per 10 gallons of water to obtain this solution. Monitor the chlorine concentration and change the solution after one hour or as needed.

AQUACULTURAL USES

FISH PONDS - Remove fish from ponds prior to treatment. Thoroughly mix 20 oz. of this product to 10,000 gallons of water to obtain 10 ppm available chlorine. Add more product to the water if the available chlorine level is below 1 ppm after 5 minutes. Return fish to pond after the available chlorine level reaches zero.

FISH POND EQUIPMENT - Thoroughly clean all equipment prior to treatment. Thoroughly mix 1 oz. of this product to 20 gallons of water to obtain 200 ppm available chlorine. Porous equipment should soak for one hour.

MAINE LOBSTER PONDS - Remove lobsters, seaweed etc. from ponds prior to treatment. Drain the pond. Thoroughly mix 1200 oz. of this product to 10,000 gallons of water to obtain at least 600 ppm available chlorine. Apply so that all barrows, gates, rock and dam are treated with product. Permit high tide to fill the pond and then close gates. Allow water to stand for 2 to 3 days until the available chlorine level reaches zero. Open gates and allow 2 tidal cycles to flush the pond before returning lobsters to pond.

CONDITIONING LIVE OYSTERS - Thoroughly mix 1 oz. of this product to 10,000 gallons of water at 50 to 70°F to obtain 0.5 ppm available chlorine. Expose oysters to this solution for at least 15 minutes, monitoring the available chlorine level so that it does not fall below 0.05 ppm. Repeat entire process if the available chlorine level drops below 0.05 ppm or the temperature falls below 50°F.

CONTROL OF SCAVENGERS IN FISH HATCHERY PONDS - Prepare a solution containing 200 ppm of available chlorine by mixing 0.5 oz. of product with 10 gallons of water. Pour into drained pond potholes. Repeat if necessary. Do not put desirable fish back into refilled ponds until chlorine residual has dropped to 0 ppm, as determined by a test kit.

SANITIZATION OF DIALYSIS MACHINES

Flush equipment thoroughly with water prior to using this product. Thoroughly mix 7 oz. of this product to 60 gallons of water to obtain at least 600 ppm available chlorine. Immediately use this product in the hemodialysate system allowing for a minimum contact time of 15 minutes at 20°F C. Drain system of the sanitizing solution and thoroughly rinse with water. Discard and DO NOT reuse the spent sanitizer. Rinsate must be monitored with a suitable test kit to insure that no available chlorine remains in the system.

This product is recommended for decontaminating single and multipatient hemodialysate systems. This product has been shown to be an effective disinfectant (virucide, fungicide, bactericide, pseudomonicide) when tested by AOAC and EPA test methods. This product may not totally eliminate all vegetative microorganisms in hemodialysate delivery systems due to their construction and/or assembly, but can be relied upon to reduce the number of microorganisms to acceptable levels when used as directed. This product should be used in a disinfectant program which includes bacteriological monitoring of the hemodialysate delivery system. This product is NOT recommended for use in hemodialysate or reverse osmosis (RO) membranes. Consult the guidelines for hemodialysate systems which are available from the Hepatitis Laboratories, CDC, Phoenix, AR 85021.

TOILET BOWL SANITIZERS

[These products are marketed as individual packages for placement in the toilet. Therefore, use directions are not appropriate.]

[Claims are limited to sanitization. No claims for disinfection are permitted.]

ASPHALT OR WOOD ROOFS AND SIDINGS

To control fungus and mildew, first remove all physical soil by brushing and hosing with clean water, and apply a 5000 ppm available chlorine solution. Mix 1 oz. of this product per gallon of water and brush or spray roof or siding. After 30 minutes, rinse by hosing with clean water.

BOAT BOTTOMS

To control slime on boat bottoms, sling a plastic tarp under boat, retaining enough water to cover the fouled bottom area, but not allowing water to enter enclosed area. This envelope should contain approximately 500 gallons of water for a 14 foot boat. Add 3.5 oz. of this product to this water to obtain a 35 ppm available chlorine concentration. Leave immersed for 8 to 12 hours. Repeat if necessary. Do not discharge the solution until the free chlorine level has dropped to 0 ppm, as determined by a swimming pool test kit.

ARTIFICIAL SAND BEACHES

To sanitize the sand, spray a 500 ppm available chlorine solution containing 0.1 oz. of this product per gallon of water at frequent intervals. Small areas can be sprinkled with a watering can.

FOOD PROCESSING PLANTS

POULTRY DRINKING WATER - Spray or flush with a solution containing 1 oz. of this product for every gallon of water. Treat poultry drinking water to a dosage of 1 to 5 ppm available chlorine by adding 1 to 5 oz. of this product per 1000 gallons of water.

FISH FILLETING - Eviscerated and degilled fish removed from the fishing vessel are placed in a wash tank of seawater or fresh water which has been treated with enough product to produce a chlorine residual of 25 ppm, as determined by a test kit. Remove fish from treated water 24 to 48 hours before filleting. After scaling the fish are again washed in a 25 ppm solution, and are ready for filleting.

PECAN CRACKING AND DYEING - Prepare a 1000 ppm available chlorine soaking solution by adding 1 oz. of this product for each 5 gallons of water to obtain a 1000 ppm available chlorine content. Soak for a minimum of 10 minutes. After removal, age pecans for 24 hours. Before bleaching, pecans are placed in a rotary cleaner where they are washed, drained, and soaked in a 2% sulphuric acid bath at 80 to 90°F for 1 minute. Transfer to a solution containing 100 oz. of this product for each 100 gallons of water (5000 ppm). After 4 to 8 minutes, they are drained and washed in a 1% sulphuric acid bath at 80 to 90°F. They are then dried.

BACTERIAL CONTROL IN SUGAR REFINERIES - To reduce dust-collecting bacteria, apply a solution containing 16 oz. of this product for each gallon of water (8000 ppm available chlorine) continuously by gravity into the recirculating low concentration syrup in the dust collector. Adjust the feed to give a chlorine residual of about 10 ppm in the syrup leaving the dust collector system. To reduce gum-forming bacteria, coat raw sugar with a solution of low concentration of product to control bacteria. To control of thermophillic bacteria in vacuum pans, feed a solution containing 1 pound of this product for each ton of sugar (dry weight) in the vacuum pans.

PRODUCT NAME

ACTIVE INGREDIENT:

Calcium Hypochlorite.....12.5%

INERT INGREDIENTS:.....87.5%

KEEP OUT OF REACH OF CHILDREN

DANGER

STATEMENT OF PRACTICAL TREATMENT (FIRST AID)^{6/}

IF CONTACT WITH EYES OCCURS, flush with water for at least 15 minutes. Get prompt medical attention.

IF CONTACT WITH SKIN OCCURS, wash with plenty of soap and water.

IF SWALLOWED, drink large quantities of milk or gelatin solution, if these are not available, drink large quantities of water. DO NOT give vinegar or other acids. DO NOT induce vomiting. Get prompt medical attention.

(See additional precautions on side panel.)

Manufactured by:
ABC Chemical Corporation
P.O. Box 99
New York, New York
99999

EPA REG NO. 10237-20002
NET CONTENTS:

EPA EST 10237-KS-1

^{6/} It is only suggested that First Aid statements be placed on the front panel. If placed on another panel (e.g. the back panel), the label must have the referral statement, "See other precautions on back panel".

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND 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 product is toxic to fish. Do not discharge into lakes, streams, ponds or public waterways unless in accordance with a NPDES permit. For guidance, contact the regional office of the U.S. Environmental Protection Agency.

PHYSICAL OR 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.

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

Store this product in a cool dry area, away from direct sunlight and heat to avoid deterioration. In case of spill, flood areas with large quantities of water. Product or rinsates that cannot be used should be diluted with water before disposal in a sanitary sewer. Do not reuse container but place in trash collection. Do not contaminate food or feed by storage, disposal or cleaning of equipment.

SWIMMING POOL WATER DISINFECTION

For a new pool or spring start-up, superchlorinate with 52 to 104 oz. of product for each 10,000 gallons of water to yield 5 to 10 ppm available chlorine by weight. Check the level of available chlorine with a test kit. Adjust and maintain pool water pH to between 7.2 to 7.6. Adjust and maintain the alkalinity of the pool to between 50 to 100 ppm.

To maintain the pool, add manually or by a feeder device 11 oz. of this product for each 10,000 gallons of water to yield an available chlorine residual between 0.6 to 1.0 ppm by weight. Stabilized pools should maintain a residual of 1.0 to 1.5 ppm available chlorine. Test the pH, available chlorine residual and alkalinity of the water frequently with appropriate test kits. Frequency of water treatment will depend upon temperature and number of swimmers.

Every 7 days, or as necessary, superchlorinate the pool with 52 to 104 oz. of product for each 10,000 gallons of water to yield 5 to 10 ppm available chlorine by weight. Check the level of available chlorine with a test kit. Do not reenter pool until the chlorine residual is between 1.0 to 3.0 ppm.

At the end of the swimming pool season or when water is to be drained from the pool, chlorine must be allowed to dissipate from treated pool water before discharge. Do not chlorinate the pool within 24 hours prior to discharge.

WINTERIZING POOLS - While water is still clear & clean, apply 3 oz. of product per 1000 gallons, while filter is running, to obtain a 3 ppm available chlorine residual, as determined by a suitable test kit. Cover pool, prepare heater, filter and heater components for winter by following manufacturers' instructions.

SPAS, HOT-TUBS, IMMERSION TANKS, ETC.

SPAS/HOT-TUBS - Apply 5 oz. of product per 1000 gallons of water to obtain a free available chlorine concentration of 5 ppm, as determined by a suitable chlorine test kit. Adjust and maintain pool water pH to between 7.2 and 7.8. Some oils, lotions, fragrances, cleaners, etc. may cause foaming or cloudy water as well as reduce the efficiency of the product.

To maintain the water, apply 5 oz. of product per 1000 gallons of water over the surface to maintain a chlorine concentration of 5 ppm.

After each use, shock treat with 8 oz. of this product per 500 gallons of water to control odor and algae.

During extended periods of disuse, add 3 oz. of product daily per 1000 gallons of water to maintain a 3 ppm chlorine concentration.

HUBBARD AND IMMERSION TANKS - Add 5 oz. of this product per 200 gallons of water before patient use to obtain a chlorine residual of 25 ppm, as determined by a suitable test kit. Adjust and maintain the water pH to between 7.2 and 7.6. After each use drain the tank. Add 5 oz. to a bucket of water and circulate this solution through the agitator of the tank for 15 minutes and then rinse out the solution. Clean tank thoroughly and dry with clean cloths.

HYDROTHERAPY TANKS - Add 1 oz. of this product per 1000 gallons of water to obtain a chlorine residual of 1 ppm, as determined by a suitable chlorine test kit. Pool should not be entered until the chlorine residual is below 3 ppm. Adjust and maintain the water pH to between 7.2 and 7.6. Operate pool filter continuously. Drain pool weekly, and clean before refilling.

SANITIZATION OF NONPOROUS FOOD CONTACT SURFACES

RINSE METHOD - A solution of 100 ppm available chlorine may be used in the sanitizing solution if a chlorine test kit is available. 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 by thoroughly mixing 1 oz. of this product with 10 gallons of water. If no test kit is available, prepare a sanitizing solution by thoroughly mixing 2 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight.

Clean equipment surfaces in the normal manner. 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 reestablish a 200 ppm residual. Do not rinse equipment with water after treatment and do not soak equipment overnight.

Sanitizers used in automated systems may be used for general cleaning but may not be re-used for sanitizing purposes.

IMMERSION METHOD - A solution of 100 ppm available chlorine may be used in the sanitizing solution if a chlorine test kit is available. 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 by thoroughly mixing 1 oz. of this product with 10 gallons of water. If no test kit is available, prepare a sanitizing solution by thoroughly mixing 2 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight.

Clean equipment 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 reestablish a 200 ppm residual. Do not rinse equipment with water after treatment.

Sanitizers used in automated systems may be used for general cleaning but may not be re-used for sanitizing purposes.

FLOW/PRESSURE METHOD - Disassemble equipment and thoroughly clean after use. Assemble equipment in operating position prior to use. Prepare a volume of a 200 ppm available chlorine sanitizing solution equal to 110% of volume capacity of the equipment by mixing the product in a ratio of 2 oz. product with 10 gallons of water. Pump solution through the system until full flow is obtained at all extremities, the system is completely filled with the sanitizer and all air is removed from the system. Close drain valves and hold under pressure for at least 2 minutes to insure contact with all internal surfaces. Remove some cleaning solution from drain valve and test with a chlorine test kit. Repeat entire cleaning/sanitizing process if effluent contains less than 50 ppm available chlorine. Rinse system with potable water prior to use.

CLEAN-IN-PLACE METHOD - Thoroughly clean equipment after use. Prepare a volume of a 200 ppm available chlorine sanitizing solution equal to 110% of volume capacity of the equipment by mixing the product in a ratio of 2 oz. product with 10 gallons of water. Pump solution through the system until full flow is obtained at all extremities, the system is completely filled with the sanitizer and all air is removed from the system. Close drain valves and hold under pressure for at least 10 minutes to insure contact with all internal surfaces. Remove some cleaning solution from drain valve and test with a chlorine test kit. Repeat entire cleaning/sanitizing process if effluent contains less than 50 ppm available chlorine. Rinse system with potable water prior to use.

SPRAY/FOG METHOD - Preclean all surfaces after use. Use a 200 ppm available chlorine solution to control bacteria, mold or fungi and a 600 ppm solution to control bacteriophage. Prepare a 200 ppm sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 2 oz. product with 10 gallons of water. Prepare a 600 ppm solution by thoroughly mixing the product in a ratio of 6 oz. product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. Thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours. Prior to using equipment, rinse all surfaces treated with a 600 ppm solution with a 200 ppm solution.

SANITIZATION OF POROUS FOOD CONTACT SURFACES

RINSE METHOD - Prepare a sanitizing solution by thoroughly mixing 6 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 6 oz. of this product with 10 gallons of water to provide

approximately 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Rinse equipment with water after treatment.

SPRAY/FOG METHOD - Preclean all surfaces after use. Prepare a 600 ppm available chlorine sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 6 oz. product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. Thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours. Prior to using equipment, rinse all surfaces with a 200 ppm available chlorine solution. Prepare a 200 ppm sanitizing solution by thoroughly mixing 2 oz. of this product with 10 gallons of water.

SANITIZATION OF NONPOROUS NON-FOOD CONTACT SURFACES

RINSE METHOD - Prepare a sanitizing solution by thoroughly mixing 2 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight. Clean equipment surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 2 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

SPRAY/FOG METHOD - Preclean all surfaces after use. Prepare a 200 ppm available chlorine sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 2 oz. product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Prior to using equipment, thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours.

DISINFECTION OF NONPOROUS NON-FOOD CONTACT SURFACES

RINSE METHOD - Prepare a disinfecting solution by thoroughly mixing 6 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the disinfecting solution, maintaining contact with the solution for at least 10 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a disinfecting solution by thoroughly mixing, in an immersion tank, 6 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the disinfecting solution for at least 10 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

SANITIZATION OF POROUS NON-FOOD CONTACT SURFACES

RINSE METHOD - Prepare a sanitizing solution by thoroughly mixing 6 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 6 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

SPRAY/FOG METHOD - After cleaning, sanitize non-food contact surfaces with 600 ppm available chlorine by thoroughly mixing the product in a ratio of 6 oz. of this product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. prior to using equipment, thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours.

SEWAGE & WASTEWATER EFFLUENT TREATMENT

The disinfection of sewage effluent must be evaluated by determining the total number of coliform bacteria and/or fecal coliform bacteria, as determined by the Most Probable Number (MPN) procedure, of the chlorinated effluent has been reduced to or below the maximum permitted by the controlling regulatory jurisdiction.

On the average, satisfactory disinfection of secondary wastewater effluent can be obtained when the chlorine residual is 0.5 ppm after 15 minutes contact. Although the chlorine residual is the critical factor in disinfection, the importance of correlating chlorine residual with bacterial kill must be emphasized. The MPN of the effluent, which is directly related to the water quality standards requirements, should be the final and primary standard and the chlorine residual should be considered an operating standard valid only to the extent verified by the coliform quality of the effluent.

The following are critical factors affecting wastewater disinfection.

1. **Mixing:** It is imperative that the product and the wastewater be instantaneously and completely flash mixed to assure reaction with every chemically active soluble and particulate component of the wastewater.
2. **Contacting:** Upon flash mixing, the flow through the system must be maintained.
3. **Dosage/Residual Control:** Successful disinfection is extremely dependent on response to fluctuating chlorine demand to maintain a

predetermined, desirable chlorine level. Secondary effluent should contain 0.2 to 1.0 ppm chlorine residual after a 15 to 30 minute contact time. A reasonable average of residual chlorine is 0.5 ppm after 15 minutes contact time.

SEWAGE AND WASTEWATER TREATMENT

EFFLUENT SLIME CONTROL - Apply a 100 to 1000 ppm available chlorine solution at a location which will allow complete mixing. Prepare this solution by mixing 10 to 100 oz. of this product with 100 gallons of water. Once control is evident, apply a 15 ppm available chlorine solution. Prepare this solution by mixing 3 oz. of this product with 100 gallons of water.

FILTER BEDS - SLIME CONTROL: Remove filter from service, drain to a depth of 1 ft. above filter sand, and add 80 oz. of product per 20 sq/ft evenly over the surface. Wait 30 minutes before draining water to a level that is even with the top of the filter. Wait for 4 to 6 hours before completely draining and backwashing filter.

DISINFECTION OF DRINKING WATER (EMERGENCY/PUBLIC/INDIVIDUAL SYSTEMS)

PUBLIC SYSTEMS: Mix a ratio of 1 oz. of this product to 100 gallons of water. Begin feeding this solution with a hypochlorinator until a free available chlorine residual of at least 0.2 ppm and no more than 0.6 ppm is attained throughout the distribution system. Check water frequently with a chlorine test kit. Bacteriological sampling must be conducted at a frequency no less than that prescribed by the National Interim Primary Drinking Water Regulations. Contact your local Health Department for further details.

INDIVIDUAL SYSTEMS: DUG WELLS Upon completion of the casing (lining) wash the interior of the casing (lining) with a 100 ppm available chlorine solution using a stiff brush. This solution can be made by thoroughly mixing 1 oz. of this product into 10 gallons of water. After covering the well, pour the sanitizing solution into the well through both the pipesleeve opening and the pipeline. Wash the exterior of the pump cylinder also with the sanitizing solution. Start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Consult your local Health Department for further details.

INDIVIDUAL WATER SYSTEMS: DRILLED, DRIVEN & BORED WELLS Run pump until water is as free from turbidity as possible. Pour a 100 ppm available chlorine sanitizing solution into the well. This solution can be made by thoroughly mixing 1 oz. of this product into 10 gallons of water. Add 5 to 10 gallons of clean, chlorinated water to the well in order to force the sanitizer into the rock formation. Wash the exterior of pump cylinder with the sanitizer. Drop pipeline into well, start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Deep wells with high water levels may necessitate the use of special methods for introduction of the sanitizer into the well. Consult your local Health Department for further details.

INDIVIDUAL WATER SYSTEMS: FLOWING ARTESIAN WELLS Artesian wells generally do not require disinfection. If analyses indicate persistent contamination, the well should be disinfected. Consult your local Health Department for further details.

EMERGENCY DISINFECTION - When boiling of water for 1 minute is not practical, water can be made potable by using this product. Prior to addition of the sanitizer, remove all suspended material by filtration or by allowing it to settle to the bottom. Decant the clarified, contaminated water to a clean container and add 1 drop of this product to 20 gallons of water. Allow the treated water to stand for 30 minutes. Properly treated water should have a slight chlorine odor, if not, repeat dosage and allow the water to stand an additional 15 minutes. The treated water can then be made palatable by pouring it between clean containers for several times.

PUBLIC WATER SYSTEMS

RESERVOIRS - ALGAE CONTROL: Hypochlorinate streams feeding the reservoir. Suitable feeding points should be selected on each stream at least 50 yards upstream from the points of entry into the reservoir.

MAINS - Thoroughly flush section to be sanitized by discharging from hydrants. Permit a water flow of at least 2.5 feet per minute to continue under pressure while injecting this product by means of a hypochlorinator. Stop water flow when a chlorine residual test of 50 ppm is obtained at the low pressure end of the new main section after a 24 hour retention time. When chlorination is completed, the system must be flushed free of all heavily chlorinated water.

NEW TANKS, BASINS, ETC. - Remove all physical soil from surfaces. Place 20 oz. of this product for each 5 cubic feet of working capacity (500 ppm available chlorine). Fill to working capacity and allow to stand for at least 4 hours. Drain and flush with potable water and return to surface.

NEW FILTER SAND - Apply 80 oz. of this product for each 150 to 200 cubic feet of sand. The action of the product dissolving as the water passes through the bed will aid in sanitizing the new sand.

NEW WELLS - Flush the casing with a 50 ppm available chlorine solution of water containing 5 oz. of this product for each 100 gallons of water. The solution should be pumped or fed by gravity into the well after thorough mixing with agitation. The well should stand for several hours or overnight under chlorination. It may then be pumped until a representative raw water sample is obtained. Bacterial examination of the water will indicate whether further treatment is necessary.

EXISTING EQUIPMENT - Remove equipment from service, thoroughly clean surfaces of all physical soil. Sanitize by placing 21 oz. of this product for each 5 cubic feet capacity (approximately 500 ppm available chlorine). Fill to working capacity and let stand at least 4 hours. Drain and place in service. If the previous treatment is not practical, surfaces may be sprayed with a solution containing 5 oz. of this product for each 5 gallons of water (approximately 1000 ppm available chlorine). After drying, flush with water and return to service.

EMERGENCY DISINFECTION AFTER FLOODS

WELLS - Thoroughly flush contaminated casing with a 500 ppm available chlorine solution. Prepare this solution by mixing 5 oz. of this product with 10 gallons of water. Backwash the well to increase yield and reduce turbidity, adding sufficient chlorinating solution to the backwash to produce a 10 ppm available chlorine

residual, as determined by a chlorine test kit. After the turbidity has been reduced and the casing has been treated, add sufficient chlorinating solution to produce a 50 ppm available chlorine residual. Agitate the well water for several hours and take a representative water sample. Retreat well if water samples are biologically unacceptable.

RESERVOIRS - In case of contamination by overflowing streams, establish hypochlorinating stations upstream of the reservoir. Chlorinate the inlet water until the entire reservoir obtains a 0.2 ppm available chlorine residual, as determined by a suitable chlorine test kit. In case of contamination from surface drainage, apply sufficient product directly to the reservoir to obtain a 0.2 ppm available chlorine residual in all parts of the reservoir.

BASINS, TANKS, FLUMES, ETC. - Thoroughly clean all equipment, then apply 20 oz. of product per 5 cu. ft. of water to obtain 500 ppm available chlorine, as determined by a suitable test kit. After 24 hours drain, flush, and return to service. If the previous method is not suitable, spray or flush the equipment with a solution containing 5 oz. of this product for each 5 gallons of water (1000 ppm available chlorine). Allow to stand for 2 to 4 hours, flush and return to service.

FILTERS - When the sand filter needs replacement, apply 80 oz. of this product for each 150 to 200 cubic feet of sand. When the filter is severely contaminated, additional product should be distributed over the surface at the rate of 80 oz. per 20 sq. ft.. Water should stand at a depth of 1 foot above the surface of the filter bed for 4 to 24 hours. When filter beds can be backwashed of mud and silt, apply 80 oz. of this product per each 50 sq. ft., allowing the water to stand at a depth of 1 foot above the filter sand. After 30 minutes, drain water to the level of the filter. After 4 to 6 hours drain, and proceed with normal backwashing.

DISTRIBUTION SYSTEM - Flush repaired or replaced section with water. Establish a hypochlorinating station and apply sufficient product until a consistent available chlorine residual of at least 10 ppm remains after a 24 hour retention time. Use a chlorine test kit.

EMERGENCY DISINFECTION AFTER FIRES

CROSS CONNECTIONS OR EMERGENCY CONNECTIONS - Hypochlorination or gravity feed equipment should be set up near the intake of the untreated water supply. Apply sufficient product to give a chlorine residual of at least 0.1 to 0.2 ppm at the point where the untreated supply enters the regular distribution system. Use a chlorine test kit.

EMERGENCY DISINFECTION AFTER DROUGHTS

SUPPLEMENTARY WATER SUPPLIES - Gravity or mechanical hypochlorite feeders should be set up on a supplementary line to dose the water to a minimum chlorine residual of 0.2 ppm after a 20 minute contact time. Use a chlorine test kit.

WATER SHIPPED IN BY TANKS, TANK CARS, TRUCKS, ETC. - Thoroughly clean all containers and equipment. Spray a 500 ppm available chlorine solution and rinse with potable water after 5 minutes. This solution is made by mixing 5 oz. of this product for each 10 gallons of water. During the filling of the containers, dose with sufficient amounts of this product to provide at least a 0.2 ppm chlorine residual. Use a chlorine test kit.

EMERGENCY DISINFECTION AFTER MAIN BREAKS

MAINS - Before assembly of the repaired section, flush out mud and soil. Permit a water flow of at least 2.5 feet per minute to continue under pressure while injecting this product by means of a hypochlorinator. Stop water flow when a chlorine residual test of 50 ppm is obtained at the low pressure end of the new main section after a 24 hour retention time. When chlorination is completed, the system must be flushed free of all heavily chlorinated water.

COOLING TOWER/EVAPORATIVE CONDENSER WATER

SLUG FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

INTERMITTENT FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system to obtain a 1 ppm residual. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown. Badly fouled systems must be cleaned before treatment is begun.

CONTINUOUS FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine.

Subsequent Dose: Maintain this treatment level by starting a continuous feed of 1 oz. of this product per 1,000 gallons of water lost by blowdown to maintain a 1 ppm residual. Badly fouled systems must be cleaned before treatment is begun.

BRIQUETTES OR TABLETS - Initially slug dose the system with 52 oz. of this product per 10,000 gallons of water in the system. Badly fouled systems must be cleaned before treatment is begun.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

LAUNDRY SANITIZERS

Household Laundry Sanitizers

IN SOAKING SUDS - Thoroughly mix 2 oz. of this product to 10 gallons of wash water to provide 200 ppm available chlorine. Wait 5 minutes, then add soap or

detergent. Immerse laundry for at least 11 minutes prior starting the wash/rinse cycle.

IN WASHING SUDS - Thoroughly mix 2 oz. of this product to 10 gallons of wash water containing clothes to provide 200 ppm available chlorine. Wait 5 minutes, then add soap or detergent and start the wash/rinse cycle.

Commercial Laundry Sanitizers

Wet fabrics or clothes should be spun dry prior to sanitization. Thoroughly mix 2 oz. of this product with 10 gallons of water to yield 200 ppm available chlorine. Promptly after mixing the sanitizer, add the solution into the prewash prior to washing fabrics/clothes in the regular wash cycle with a good detergent. Test the level of available chlorine, if solution has been allowed to stand. Add more of this product if the the available chlorine level has dropped below 200 ppm.

FARM PREMISES

Remove all animals, poultry, and feed from premises, vehicles, and enclosures. Remove all litter and manure from floors, walls and surfaces of barns, pens, stalls, chutes and other facilities occupied or transverse by animals or poultry. Empty all troughs, racks and other feeding and watering appliances. Thoroughly clean all surfaces with soap or detergent and rinse with water. To disinfect, saturate all surfaces with a solution of at least 1000 ppm available chlorine for a period of 10 minutes. A 1000 ppm solution can be made by thoroughly mixing 11 oz. of this product with 10 gallons of water. Immerse all halters, ropes and other types of equipment used in handling and restraining animals or poultry, as well as the cleaned forks, shovels and scrapers used for removing litter and manure. Ventilate buildings, cars, boats and other closed spaces. Do not house livestock or poultry or employ equipment until chlorine has been dissipated. All treated feed racks, mangers, troughs, automatic feeders, fountains and waterers must be rinsed with potable water before reuse.

PULP AND PAPER MILL PROCESS WATER SYSTEMS

SLUG FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

INTERMITTENT FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system to obtain a 1 ppm residual. Apply

half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown. Badly fouled systems must be cleaned before treatment is begun.

CONTINUOUS FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine.

Subsequent Dose: Maintain this treatment level by starting a continuous feed of 1 oz. of this product per 1,000 gallons of water lost by blowdown to maintain a 1 ppm residual. Badly fouled systems must be cleaned before treatment is begun.

BRIQUETTES OR TABLETS - Initially slug dose the system with 52 oz. of this product per 10,000 gallons of water in the system. Badly fouled systems must be cleaned before treatment is begun.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

AGRICULTURAL USES

POST-HARVEST PROTECTION - Potatoes can be sanitized after cleaning and prior to storage by spraying with a sanitizing solution at a level of 1 gallon of sanitizing solution per tons of potatoes. Thoroughly mix 1 oz. of this product to 2 gallons of water to obtain 500 ppm available chlorine.

Disinfect leafcutting bee cells and bee boards by immersion in a solution containing 1 ppm available chlorine for 3 minutes. Allow cells to drain for 2 minutes and dry for 4 to 5 hours or until no chlorine odor can be detected. This solution is made by thoroughly mix 1 Tsp. of this product to 100 gallons of water. The bee domicile is disinfected by spraying with a 0.1 ppm solution until all surfaces are thoroughly wet. Allow the domicile to dry until all chlorine odor has dissipated.

FOOD EGG SANITIZATION - Thoroughly clean all eggs. Thoroughly mix 2 oz. of this product with 10 gallons of warm water to produce a 200 ppm available chlorine solution. The sanitizer temperature should not exceed 130° F. Spray the warm sanitizer so that the eggs are thoroughly wetted. Allow the eggs to thoroughly dry before casing or breaking. Do not apply a potable water rinse. The solution should not be re-used to sanitize eggs.

FRUIT & VEGETABLE WASHING - Thoroughly clean all fruits and vegetables in a wash tank. Thoroughly mix 5 oz. of this product in 200 gallons of water to make a sanitizing solution of 25 ppm available chlorine. After draining the tank, submerge fruit or vegetables for 2 minutes in a second wash tank containing the recirculating sanitizing solution. Spray rinse vegetables with the sanitizing solution prior to packaging. Rinse fruit with potable water only prior to packaging.

SEEDS - To control bacterial spot (Xanthomonas vesticatoris) on Pimento seeds, initially remove moist seeds from ripe fruits. To control surface fungi and bacteria on Tomato seeds initially wash seeds. Immediately soak seeds in 39,000 ppm solution

for 15 minutes with continuous agitation. After treatment rinse seeds in potable water for 15 minutes. Dry seeds to normal moisture. The solution may be made by mixing 40 oz. of this product with each gallon of water.

MUSHROOMS - To control bacterial blotch (*Pseudomonas tolaasii*), use a 100 to 200 ppm solution prior to watering mushroom production surfaces. This solution may be made by mixing 1 to 2 oz. of this product with 10 gallons of water. First application should begin when pins form, and thereafter, between breaks on a need basis depending on the occurrence of bacterial blotch. This product may be applied directly to pins to control small infection foci. Apply 7.5 to 10 oz. per square foot of growing space.

POST-HARVEST ROOTS - To control and reduce the spread of soft rot causing organisms in water and on sweet potatoes (*Ipomoea batatas*), spray or dip the potatoes with a 150 to 500 ppm solution for 2 to 5 minutes. Thoroughly mix 3 to 10 oz. of this product per 20 gallons of water to obtain this solution. Monitor the chlorine concentration and change the solution after one hour or as needed.

AQUACULTURAL USES

FISH PONDS - Remove fish from ponds prior to treatment. Thoroughly mix 103 oz. of this product to 10,000 gallons of water to obtain 10 ppm available chlorine. Add more product to the water if the available chlorine level is below 1 ppm after 5 minutes. Return fish to pond after the available chlorine level reaches zero.

FISH POND EQUIPMENT - Thoroughly clean all equipment prior to treatment. Thoroughly mix 2 oz. of this product to 10 gallons of water to obtain 200 ppm available chlorine. Porous equipment should soak for one hour.

MAINE LOBSTER PONDS - Remove lobsters, seaweed etc. from ponds prior to treatment. Drain the pond. Thoroughly mix 6,200 oz. of this product to 10,000 gallons of water to obtain at least 600 ppm available chlorine. Apply so that all barrows, gates, rock and dam are treated with product. Permit high tide to fill the pond and then close gates. Allow water to stand for 2 to 3 days until the available chlorine level reaches zero. Open gates and allow 2 tidal cycles to flush the pond before returning lobsters to pond.

CONDITIONING LIVE OYSTERS - Thoroughly mix 5 oz. of this product to 10,000 gallons of water at 50 to 70°F to obtain 0.5 ppm available chlorine. Expose oysters to this solution for at least 15 minutes, monitoring the available chlorine level so that it does not fall below 0.05 ppm. Repeat entire process if the available chlorine level drops below 0.05 ppm or the temperature falls below 50°F.

CONTROL OF SCAVENGERS IN FISH HATCHERY PONDS - Prepare a solution containing 200 ppm of available chlorine by mixing 2 oz. of product with 10 gallons of water. Pour into drained pond potholes. Repeat if necessary. Do not put desirable fish back into refilled ponds until chlorine residual has dropped to 0 ppm, as determined by a test kit.

SANITIZATION OF DIALYSIS MACHINES

Flush equipment thoroughly with water prior to using this product. Thoroughly mix 6 oz. of this product to 10 gallons of water to obtain at least 600 ppm available chlorine. Immediately use this product in the hemodialysate system allowing for a minimum contact time of 15 minutes at 20°C. Drain system of

the sanitizing solution and thoroughly rinse with water. Discard and DO NOT reuse the spent sanitizer. Rinsate must be monitored with a suitable test kit to insure that no available chlorine remains in the system.

This product is recommended for decontaminating single and multipatient hemodialysate systems. This product has been shown to be an effective disinfectant (virucide, fungicide, bactericide, pseudomonicide) when tested by AOAC and EPA test methods. This product may not totally eliminate all vegetative microorganisms in hemodialysate delivery systems due to their construction and/or assembly, but can be relied upon to reduce the number of microorganisms to acceptable levels when used as directed. This product should be used in a disinfectant program which includes bacteriological monitoring of the hemodialysate delivery system. This product is NOT recommended for use in hemodialysate or reverse osmosis (RO) membranes.

Consult the guidelines for hemodialysate systems which are available from the Hepatitis Laboratories, CDC, Phoenix, AR 85021.

ASPHALT OR WOOD ROOFS AND SIDINGS

To control fungus and mildew, first remove all physical soil by brushing and hosing with clean water, and apply a 5000 ppm available chlorine solution. Mix 5 oz. of this product per gallon of water and brush or spray roof or siding. After 30 minutes, rinse by hosing with clean water.

BOAT BOTTOMS

To control slime on boat bottoms, sling a plastic tarp under boat, retaining enough water to cover the fouled bottom area, but not allowing water to enter enclosed area. This envelope should contain approximately 500 gallons of water for a 14 foot boat. Add 18 oz. of this product to this water to obtain a 35 ppm available chlorine concentration. Leave immersed for 8 to 12 hours. Repeat if necessary. Do not discharge the solution until the free chlorine level has dropped to 0 ppm, as determined by a swimming pool test kit.

ARTIFICIAL SAND BEACHES

To sanitize the sand, spray a 500 ppm available chlorine solution containing 5 oz. of this product per 10 gal. of water at frequent intervals. Small areas can be sprinkled with a watering can.

FOOD PROCESSING PLANTS

POULTRY DRINKING WATER - Spray or flush with a solution containing 5 oz. of this product for every gallon of water. Treat poultry drinking water to a dosage of 1 to 5 ppm available chlorine by adding 5 to 25 oz. of this product per 1000 gallons of water.

FISH FILLETING - Eviscerated and degilled fish removed from the fishing vessel are placed in a wash tank of seawater or fresh water which has been treated with enough product to produce a chlorine residual of 25 ppm, as determined by a test kit. Remove fish from treated water 24 to 48 hours before filleting. After scaling the fish are again washed in a 25 ppm solution, and are ready for filleting.

PECAN CRACKING AND DYEING - Prepare a 1000 ppm available chlorine soaking solution by adding 5 oz. of this product for each 5 gallons of water to obtain a 1000 ppm available chlorine content. Soak for a minimum of 10 minutes. After removal, age pecans for 24 hours. Before bleaching, pecans are placed in a rotary cleaner where they are washed, drained, and soaked in a 2% sulphuric acid bath at 80 to 90°F for 1 minute. Transfer to a solution containing 512 oz. of this product for each 100 gallons of water (5000 ppm). After 4 to 8 minutes, they are drained and washed in a 1% sulphuric acid bath at 80 to 90°F. They are then dried.

BACTERIAL CONTROL IN SUGAR REFINERIES - To reduce dust-collecting bacteria, apply a solution containing 84 oz. of this product for each gallon of water (8000 ppm available chlorine) continuously by gravity into the recirculating low concentration syrup in the dust collector. Adjust the feed to give a chlorine residual of about 10 ppm in the syrup leaving the dust collector system. To reduce gum-forming bacteria, coat raw sugar with a solution of low concentration of product to control bacteria. To control of thermophillic bacteria in vacuum pans, feed a solution containing 84 oz. of this product for each ton of sugar (dry weight) in the vacuum pans.

TOILET BOWL SANITIZERS

[These products are marketed as individual packages for placement in the toilet. Therefore, use directions are not appropriate.]

[Claims are limited to sanitization. No claims for disinfection are permitted.]

PRODUCT NAME

ACTIVE INGREDIENT:

Sodium Hypochlorite.....12.5%

INERT INGREDIENTS:.....87.5%

KEEP OUT OF REACH OF CHILDREN

DANGER

STATEMENT OF PRACTICAL TREATMENT (FIRST AID)^{6/}

IF CONTACT WITH EYES OCCURS, flush with water for at least 15 minutes. Get prompt medical attention.

IF CONTACT WITH SKIN OCCURS, wash with plenty of soap and water.

IF SWALLOWED, drink large quantities of milk or gelatin solution, if these are not available, drink large quantities of water. DO NOT give vinegar or other acids. DO NOT induce vomiting. Get prompt medical attention.

(See additional precautions on side panel.)

Manufactured by:
ABC Chemical Corporation
P.O. Box 99
New York, New York
99999

EPA REG NO. 10237-20003
NET CONTENTS:

EPA EST 10237-KS-1

^{6/} It is only suggested that First Aid statements be placed on the front panel. If placed on another panel (e.g. the back panel), the label must have the referral statement, "See other precautions on back panel".

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND 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 product is toxic to fish. Do not discharge into lakes, streams, ponds or public waterways unless in accordance with a NPDES permit. For guidance, contact the regional office of the U.S. Environmental Protection Agency.

PHYSICAL OR 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.

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

Store this product in a cool dry area, away from direct sunlight and heat to avoid deterioration. In case of spill, flood areas with large quantities of water. Product or rinsates that cannot be used should be diluted with water before disposal in a sanitary sewer. Do not reuse container but place in trash collection. Do not contaminate food or feed by storage, disposal or cleaning of equipment.

SWIMMING POOL WATER DISINFECTION

For a new pool or spring start-up, superchlorinate with 52 to 104 oz. of product for each 10,000 gallons of water to yield 5 to 10 ppm available chlorine by weight. Check the level of available chlorine with a test kit. Adjust and maintain pool water pH to between 7.2 to 7.6. Adjust and maintain the alkalinity of the pool to between 50 to 100 ppm.

To maintain the pool, add manually or by a feeder device 11 oz. of this product for each 10,000 gallons of water to yield an available chlorine residual between 0.6 to 1.0 ppm by weight. Stabilized pools should maintain a residual of 1.0 to 1.5 ppm available chlorine. Test the pH, available chlorine residual and alkalinity of the water frequently with appropriate test kits. Frequency of water treatment will depend upon temperature and number of swimmers.

Every 7 days, or as necessary, superchlorinate the pool with 52 to 104 oz. of product for each 10,000 gallons of water to yield 5 to 10 ppm available chlorine by weight. Check the level of available chlorine with a test kit. Do not reenter pool until the chlorine residual is between 1.0 to 3.0 ppm.

At the end of the swimming pool season or when water is to be drained from the pool, chlorine must be allowed to dissipate from treated pool water before discharge. Do not chlorinate the pool within 24 hours prior to discharge.

WINTERIZING POOLS - While water is still clear & clean, apply 3 oz. of product per 1000 gallons, while filter is running, to obtain a 3 ppm available chlorine residual, as determined by a suitable test kit. Cover pool, prepare heater, filter and heater components for winter by following manufacturers' instructions.

SPAS, HOT-TUBS, IMMERSION TANKS, ETC.

SPAS/HOT-TUBS - Apply 5 oz. of product per 1000 gallons of water to obtain a free available chlorine concentration of 5 ppm, as determined by a suitable chlorine test kit. Adjust and maintain pool water pH to between 7.2 and 7.8. Some oils, lotions, fragrances, cleaners, etc. may cause foaming or cloudy water as well as reduce the efficiency of the product.

To maintain the water, apply 5 oz. of product per 1000 gallons of water over the surface to maintain a chlorine concentration of 5 ppm.

After each use, shock treat with 8 oz. of this product per 500 gallons of water to control odor and algae.

During extended periods of disuse, add 3 oz. of product daily per 1000 gallons of water to maintain a 3 ppm chlorine concentration.

HUBBARD AND IMMERSION TANKS - Add 5 oz. of this product per 200 gallons of water before patient use to obtain a chlorine residual of 25 ppm, as determined by a suitable test kit. Adjust and maintain the water pH to between 7.2 and 7.6. After each use drain the tank. Add 5 oz. to a bucket of water and circulate this solution through the agitator of the tank for 15 minutes and then rinse out the solution. Clean tank thoroughly and dry with clean cloths.

HYDROTHERAPY TANKS - Add 1 oz. of this product per 1000 gallons of water to obtain a chlorine residual of 1 ppm, as determined by a suitable chlorine test kit. Pool should not be entered until the chlorine residual is below 3 ppm. Adjust and maintain the water pH to between 7.2 and 7.6. Operate pool filter continuously. Drain pool weekly, and clean before refilling.

SANITIZATION OF NONPOROUS FOOD CONTACT SURFACES

RINSE METHOD - A solution of 100 ppm available chlorine may be used in the sanitizing solution if a chlorine test kit is available. 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 by thoroughly mixing 1 oz. of this product with 10 gallons of water. If no test kit is available, prepare a sanitizing solution by thoroughly mixing 2 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight.

Clean equipment surfaces in the normal manner. 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 reestablish a 200 ppm residual. Do not rinse equipment with water after treatment and do not soak equipment overnight.

Sanitizers used in automated systems may be used for general cleaning but may not be re-used for sanitizing purposes.

IMMERSION METHOD - A solution of 100 ppm available chlorine may be used in the sanitizing solution if a chlorine test kit is available. 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 by thoroughly mixing 1 oz. of this product with 10 gallons of water. If no test kit is available, prepare a sanitizing solution by thoroughly mixing 2 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight.

Clean equipment 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 reestablish a 200 ppm residual. Do not rinse equipment with water after treatment.

Sanitizers used in automated systems may be used for general cleaning but may not be re-used for sanitizing purposes.

FLOW/PRESSURE METHOD - Disassemble equipment and thoroughly clean after use. Assemble equipment in operating position prior to use. Prepare a volume of a 200 ppm available chlorine sanitizing solution equal to 110% of volume capacity of the equipment by mixing the product in a ratio of 2 oz. product with 10 gallons of water. Pump solution through the system until full flow is obtained at all extremities, the system is completely filled with the sanitizer and all air is removed from the system. Close drain valves and hold under pressure for at least 2 minutes to insure contact with all internal surfaces. Remove some cleaning solution from drain valve and test with a chlorine test kit. Repeat entire cleaning/sanitizing process if effluent contains less than 50 ppm available chlorine. Rinse system with potable water prior to use.

CLEAN-IN-PLACE METHOD - Thoroughly clean equipment after use. Prepare a volume of a 200 ppm available chlorine sanitizing solution equal to 110% of volume capacity of the equipment by mixing the product in a ratio of 2 oz. product with 10 gallons of water. Pump solution through the system until full flow is obtained at all extremities, the system is completely filled with the sanitizer and all air is removed from the system. Close drain valves and hold under pressure for at least 10 minutes to insure contact with all internal surfaces. Remove some cleaning solution from drain valve and test with a chlorine test kit. Repeat entire cleaning/sanitizing process if effluent contains less than 50 ppm available chlorine. Rinse system with potable water prior to use.

SPRAY/FOG METHOD - Preclean all surfaces after use. Use a 200 ppm available chlorine solution to control bacteria, mold or fungi and a 600 ppm solution to control bacteriophage. Prepare a 200 ppm sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 2 oz. product with 10 gallons of water. Prepare a 600 ppm solution by thoroughly mixing the product in a ratio of 6 oz. product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. Thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours. Prior to using equipment, rinse all surfaces treated with a 600 ppm solution with a 200 ppm solution.

SANITIZATION OF POROUS FOOD CONTACT SURFACES

RINSE METHOD - Prepare a sanitizing solution by thoroughly mixing 6 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 6 oz. of this product with 10 gallons of water to provide

approximately 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Rinse equipment with water after treatment.

SPRAY/FOG METHOD - Preclean all surfaces after use. Prepare a 600 ppm available chlorine sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 6 oz. product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. Thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours. Prior to using equipment, rinse all surfaces with a 200 ppm available chlorine solution. Prepare a 200 ppm sanitizing solution by thoroughly mixing 2 oz. of this product with 10 gallons of water.

SANITIZATION OF NONPOROUS NON-FOOD CONTACT SURFACES

RINSE METHOD - Prepare a sanitizing solution by thoroughly mixing 2 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight. Clean equipment surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 2 oz. of this product with 10 gallons of water to provide approximately 200 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

SPRAY/FOG METHOD - Preclean all surfaces after use. Prepare a 200 ppm available chlorine sanitizing solution of sufficient size by thoroughly mixing the product in a ratio of 2 oz. product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Prior to using equipment, thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours.

DISINFECTION OF NONPOROUS NON-FOOD CONTACT SURFACES

RINSE METHOD - Prepare a disinfecting solution by thoroughly mixing 6 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the disinfecting solution, maintaining contact with the solution for at least 10 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a disinfecting solution by thoroughly mixing, in an immersion tank, 6 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the disinfecting solution for at least 10 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

SANITIZATION OF POROUS NON-FOOD CONTACT SURFACES

RINSE METHOD - Prepare a sanitizing solution by thoroughly mixing 6 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean surfaces in the normal manner. Prior to use, rinse all surfaces thoroughly with the sanitizing solution, maintaining contact with the sanitizer for at least 2 minutes. Do not rinse equipment with water after treatment and do not soak equipment overnight.

IMMERSION METHOD - Prepare a sanitizing solution by thoroughly mixing, in an immersion tank, 6 oz. of this product with 10 gallons of water to provide approximately 600 ppm available chlorine by weight. Clean equipment in the normal manner. Prior to use, immerse equipment in the sanitizing solution for at least 2 minutes and allow the sanitizer to drain. Do not rinse equipment with water after treatment.

SPRAY/FOG METHOD - After cleaning, sanitize non-food contact surfaces with 600 ppm available chlorine by thoroughly mixing the product in a ratio of 6 oz. of this product with 10 gallons of water. Use spray or fogging equipment which can resist hypochlorite solutions. Always empty and rinse spray/fog equipment with potable water after use. prior to using equipment, thoroughly spray or fog all surfaces until wet, allowing excess sanitizer to drain. Vacate area for at least 2 hours.

SEWAGE & WASTEWATER EFFLUENT TREATMENT

The disinfection of sewage effluent must be evaluated by determining the total number of coliform bacteria and/or fecal coliform bacteria, as determined by the Most Probable Number (MPN) procedure, of the chlorinated effluent has been reduced to or below the maximum permitted by the controlling regulatory jurisdiction.

On the average, satisfactory disinfection of secondary wastewater effluent can be obtained when the chlorine residual is 0.5 ppm after 15 minutes contact. Although the chlorine residual is the critical factor in disinfection, the importance of correlating chlorine residual with bacterial kill must be emphasized. The MPN of the effluent, which is directly related to the water quality standards requirements, should be the final and primary standard and the chlorine residual should be considered an operating standard valid only to the extent verified by the coliform quality of the effluent.

The following are critical factors affecting wastewater disinfection.

1. **Mixing:** It is imperative that the product and the wastewater be instantaneously and completely flash mixed to assure reaction with every chemically active soluble and particulate component of the wastewater.
2. **Contacting:** Upon flash mixing, the flow through the system must be maintained.
3. **Dosage/Residual Control:** Successful disinfection is extremely dependent on response to fluctuating chlorine demand to maintain a

predetermined, desirable chlorine level. Secondary effluent should contain 0.2 to 1.0 ppm chlorine residual after a 15 to 30 minute contact time. A reasonable average of residual chlorine is 0.5 ppm after 15 minutes contact time.

SEWAGE AND WASTEWATER TREATMENT

EFFLUENT SLIME CONTROL - Apply a 100 to 1000 ppm available chlorine solution at a location which will allow complete mixing. Prepare this solution by mixing 10 to 100 oz. of this product with 100 gallons of water. Once control is evident, apply a 15 ppm available chlorine solution. Prepare this solution by mixing 3 oz. of this product with 100 gallons of water.

FILTER BEDS - SLIME CONTROL: Remove filter from service, drain to a depth of 1 ft. above filter sand, and add 80 oz. of product per 20 sq/ft evenly over the surface. Wait 30 minutes before draining water to a level that is even with the top of the filter. Wait for 4 to 6 hours before completely draining and backwashing filter.

DISINFECTION OF DRINKING WATER (EMERGENCY/PUBLIC/INDIVIDUAL SYSTEMS)

PUBLIC SYSTEMS: Mix a ratio of 1 oz. of this product to 100 gallons of water. Begin feeding this solution with a hypochlorinator until a free available chlorine residual of at least 0.2 ppm and no more than 0.6 ppm is attained throughout the distribution system. Check water frequently with a chlorine test kit. Bacteriological sampling must be conducted at a frequency no less than that prescribed by the National Interim Primary Drinking Water Regulations. Contact your local Health Department for further details.

INDIVIDUAL SYSTEMS: DUG WELLS Upon completion of the casing (lining) wash the interior of the casing (lining) with a 100 ppm available chlorine solution using a stiff brush. This solution can be made by thoroughly mixing 1 oz. of this product into 10 gallons of water. After covering the well, pour the sanitizing solution into the well through both the pipesleeve opening and the pipeline. Wash the exterior of the pump cylinder also with the sanitizing solution. Start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Consult your local Health Department for further details.

INDIVIDUAL WATER SYSTEMS: DRILLED, DRIVEN & BORED WELLS Run pump until water is as free from turbidity as possible. Pour a 100 ppm available chlorine sanitizing solution into the well. This solution can be made by thoroughly mixing 1 oz. of this product into 10 gallons of water. Add 5 to 10 gallons of clean, chlorinated water to the well in order to force the sanitizer into the rock formation. Wash the exterior of pump cylinder with the sanitizer. Drop pipeline into well, start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Deep wells with high water levels may necessitate the use of special methods for introduction of the sanitizer into the well. Consult your local Health Department for further details.

INDIVIDUAL WATER SYSTEMS: FLOWING ARTESIAN WELLS Artesian wells generally do not require disinfection. If analyses indicate persistent contamination, the well should be disinfected. Consult your local Health Department for further details.

EMERGENCY DISINFECTION - When boiling of water for 1 minute is not practical, water can be made potable by using this product. Prior to addition of the sanitizer, remove all suspended material by filtration or by allowing it to settle to the bottom. Decant the clarified, contaminated water to a clean container and add 1 drop of this product to 20 gallons of water. Allow the treated water to stand for 30 minutes. Properly treated water should have a slight chlorine odor, if not, repeat dosage and allow the water to stand an additional 15 minutes. The treated water can then be made palatable by pouring it between clean containers for several times.

PUBLIC WATER SYSTEMS

RESERVOIRS - ALGAE CONTROL: Hypochlorinate streams feeding the reservoir. Suitable feeding points should be selected on each stream at least 50 yards upstream from the points of entry into the reservoir.

MAINS - Thoroughly flush section to be sanitized by discharging from hydrants. Permit a water flow of at least 2.5 feet per minute to continue under pressure while injecting this product by means of a hypochlorinator. Stop water flow when a chlorine residual test of 50 ppm is obtained at the low pressure end of the new main section after a 24 hour retention time. When chlorination is completed, the system must be flushed free of all heavily chlorinated water.

NEW TANKS, BASINS, ETC. - Remove all physical soil from surfaces. Place 20 oz. of this product for each 5 cubic feet of working capacity (500 ppm available chlorine). Fill to working capacity and allow to stand for at least 4 hours. Drain and flush with potable water and return to surface.

NEW FILTER SAND - Apply 80 oz. of this product for each 150 to 200 cubic feet of sand. The action of the product dissolving as the water passes through the bed will aid in sanitizing the new sand.

NEW WELLS - Flush the casing with a 50 ppm available chlorine solution of water containing 5 oz. of this product for each 100 gallons of water. The solution should be pumped or fed by gravity into the well after thorough mixing with agitation. The well should stand for several hours or overnight under chlorination. It may then be pumped until a representative raw water sample is obtained. Bacterial examination of the water will indicate whether further treatment is necessary.

EXISTING EQUIPMENT - Remove equipment from service, thoroughly clean surfaces of all physical soil. Sanitize by placing 21 oz. of this product for each 5 cubic feet capacity (approximately 500 ppm available chlorine). Fill to working capacity and let stand at least 4 hours. Drain and place in service. If the previous treatment is not practical, surfaces may be sprayed with a solution containing 5 oz. of this product for each 5 gallons of water (approximately 1000 ppm available chlorine). After drying, flush with water and return to service.

EMERGENCY DISINFECTION AFTER FLOODS

WELLS - Thoroughly flush contaminated casing with a 500 ppm available chlorine solution. Prepare this solution by mixing 5 oz. of this product with 10 gallons of water. Backwash the well to increase yield and reduce turbidity, adding sufficient chlorinating solution to the backwash to produce a 10 ppm available chlorine

residual, as determined by a chlorine test kit. After the turbidity has been reduced and the casing has been treated, add sufficient chlorinating solution to produce a 50 ppm available chlorine residual. Agitate the well water for several hours and take a representative water sample. Retreat well if water samples are biologically unacceptable.

RESERVOIRS - In case of contamination by overflowing streams, establish hypochlorinating stations upstream of the reservoir. Chlorinate the inlet water until the entire reservoir obtains a 0.2 ppm available chlorine residual, as determined by a suitable chlorine test kit. In case of contamination from surface drainage, apply sufficient product directly to the reservoir to obtain a 0.2 ppm available chlorine residual in all parts of the reservoir.

BASINS, TANKS, FLUMES, ETC. - Thoroughly clean all equipment, then apply 20 oz. of product per 5 cu. ft. of water to obtain 500 ppm available chlorine, as determined by a suitable test kit. After 24 hours drain, flush, and return to service. If the previous method is not suitable, spray or flush the equipment with a solution containing 5 oz. of this product for each 5 gallons of water (1000 ppm available chlorine). Allow to stand for 2 to 4 hours, flush and return to service.

FILTERS - When the sand filter needs replacement, apply 80 oz. of this product for each 150 to 200 cubic feet of sand. When the filter is severely contaminated, additional product should be distributed over the surface at the rate of 80 oz. per 20 sq. ft.. Water should stand at a depth of 1 foot above the surface of the filter bed for 4 to 24 hours. When filter beds can be backwashed of mud and silt, apply 80 oz. of this product per each 50 sq. ft., allowing the water to stand at a depth of 1 foot above the filter sand. After 30 minutes, drain water to the level of the filter. After 4 to 6 hours drain, and proceed with normal backwashing.

DISTRIBUTION SYSTEM - Flush repaired or replaced section with water. Establish a hypochlorinating station and apply sufficient product until a consistent available chlorine residual of at least 10 ppm remains after a 24 hour retention time. Use a chlorine test kit.

EMERGENCY DISINFECTION AFTER FIRES

CROSS CONNECTIONS OR EMERGENCY CONNECTIONS - Hypochlorination or gravity feed equipment should be set up near the intake of the untreated water supply. Apply sufficient product to give a chlorine residual of at least 0.1 to 0.2 ppm at the point where the untreated supply enters the regular distribution system. Use a chlorine test kit.

EMERGENCY DISINFECTION AFTER DROUGHTS

SUPPLEMENTARY WATER SUPPLIES - Gravity or mechanical hypochlorite feeders should be set up on a supplementary line to dose the water to a minimum chlorine residual of 0.2 ppm after a 20 minute contact time. Use a chlorine test kit.

WATER SHIPPED IN BY TANKS, TANK CARS, TRUCKS, ETC. - Thoroughly clean all containers and equipment. Spray a 500 ppm available chlorine solution and rinse with potable water after 5 minutes. This solution is made by mixing 5 oz. of this product for each 10 gallons of water. During the filling of the containers, dose with sufficient amounts of this product to provide at least a 0.2 ppm chlorine residual. Use a chlorine test kit.

EMERGENCY DISINFECTION AFTER MAIN BREAKS

MAINS - Before assembly of the repaired section, flush out mud and soil. Permit a water flow of at least 2.5 feet per minute to continue under pressure while injecting this product by means of a hypochlorinator. Stop water flow when a chlorine residual test of 50 ppm is obtained at the low pressure end of the new main section after a 24 hour retention time. When chlorination is completed, the system must be flushed free of all heavily chlorinated water.

COOLING TOWER/EVAPORATIVE CONDENSER WATER

SLUG FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

INTERMITTENT FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system to obtain a 1 ppm residual. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown. Badly fouled systems must be cleaned before treatment is begun.

CONTINUOUS FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine.

Subsequent Dose: Maintain this treatment level by starting a continuous feed of 1 oz. of this product per 1,000 gallons of water lost by blowdown to maintain a 1 ppm residual. Badly fouled systems must be cleaned before treatment is begun.

BRIQUETTES OR TABLETS - Initially slug dose the system with 52 oz. of this product per 10,000 gallons of water in the system. Badly fouled systems must be cleaned before treatment is begun.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

LAUNDRY SANITIZERS

Household Laundry Sanitizers

IN SOAKING SUDS - Thoroughly mix 2 oz. of this product to 10 gallons of wash water to provide 200 ppm available chlorine. Wait 5 minutes, then add soap or

detergent. Immerse laundry for at least 11 minutes prior starting the wash/rinse cycle.

IN WASHING SUDS - Thoroughly mix 2 oz. of this product to 10 gallons of wash water containing clothes to provide 200 ppm available chlorine. Wait 5 minutes, then add soap or detergent and start the wash/rinse cycle.

Commercial Laundry Sanitizers

Wet fabrics or clothes should be spun dry prior to sanitization. Thoroughly mix 2 oz. of this product with 10 gallons of water to yield 200 ppm available chlorine. Promptly after mixing the sanitizer, add the solution into the prewash prior to washing fabrics/clothes in the regular wash cycle with a good detergent. Test the level of available chlorine, if solution has been allowed to stand. Add more of this product if the the available chlorine level has dropped below 200 ppm.

FARM PREMISES

Remove all animals, poultry, and feed from premises, vehicles, and enclosures. Remove all litter and manure from floors, walls and surfaces of barns, pens, stalls, chutes and other facilities occupied or transverse by animals or poultry. Empty all troughs, racks and other feeding and watering appliances. Thoroughly clean all surfaces with soap or detergent and rinse with water. To disinfect, saturate all surfaces with a solution of at least 1000 ppm available chlorine for a period of 10 minutes. A 1000 ppm solution can be made by thoroughly mixing 11 oz. of this product with 10 gallons of water. Immerse all halters, ropes and other types of equipment used in handling and restraining animals or poultry, as well as the cleaned forks, shovels and scrapers used for removing litter and manure. Ventilate buildings, cars, boats and other closed spaces. Do not house livestock or poultry or employ equipment until chlorine has been dissipated. All treated feed racks, mangers, troughs, automatic feeders, fountains and waterers must be rinsed with potable water before reuse.

PULP AND PAPER MILL PROCESS WATER SYSTEMS

SLUG FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

INTERMITTENT FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system to obtain a 1 ppm residual. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5)

of the water in the system has been lost by blowdown. Badly fouled systems must be cleaned before treatment is begun.

CONTINUOUS FEED METHOD - Initial Dose: When system is noticeably fouled, apply 52 to 104 oz. of this product per 10,000 gallons of water in the system to obtain 5 to 10 ppm available chlorine.

Subsequent Dose: Maintain this treatment level by starting a continuous feed of 1 oz. of this product per 1,000 gallons of water lost by blowdown to maintain a 1 ppm residual. Badly fouled systems must be cleaned before treatment is begun.

BRIQUETTES OR TABLETS - Initially slug dose the system with 52 oz. of this product per 10,000 gallons of water in the system. Badly fouled systems must be cleaned before treatment is begun.

Subsequent Dose: When microbial control is evident, add 11 oz. of this product per 10,000 gallons of water in the system daily, or as needed to maintain control and keep the chlorine residual at 1 ppm. Badly fouled systems must be cleaned before treatment is begun.

AGRICULTURAL USES

POST-HARVEST PROTECTION - Potatoes can be sanitized after cleaning and prior to storage by spraying with a sanitizing solution at a level of 1 gallon of sanitizing solution per tons of potatoes. Thoroughly mix 1 oz. of this product to 2 gallons of water to obtain 500 ppm available chlorine.

Disinfect leafcutting bee cells and bee boards by immersion in a solution containing 1 ppm available chlorine for 3 minutes. Allow cells to drain for 2 minutes and dry for 4 to 5 hours or until no chlorine odor can be detected. This solution is made by thoroughly mix 1 Tsp. of this product to 100 gallons of water. The bee domicile is disinfected by spraying with a 0.1 ppm solution until all surfaces are thoroughly wet. Allow the domicile to dry until all chlorine odor has dissipated.

FOOD EGG SANITIZATION - Thoroughly clean all eggs. Thoroughly mix 2 oz. of this product with 10 gallons of warm water to produce a 200 ppm available chlorine solution. The sanitizer temperature should not exceed 130° F. Spray the warm sanitizer so that the eggs are thoroughly wetted. Allow the eggs to thoroughly dry before casing or breaking. Do not apply a potable water rinse. The solution should not be re-used to sanitize eggs.

FRUIT & VEGETABLE WASHING - Thoroughly clean all fruits and vegetables in a wash tank. Thoroughly mix 5 oz. of this product in 200 gallons of water to make a sanitizing solution of 25 ppm available chlorine. After draining the tank, submerge fruit or vegetables for 2 minutes in a second wash tank containing the recirculating sanitizing solution. Spray rinse vegetables with the sanitizing solution prior to packaging. Rinse fruit with potable water only prior to packaging.

AQUACULTURAL USES

FISH PONDS - Remove fish from ponds prior to treatment. Thoroughly mix 103 oz. of this product to 10,000 gallons of water to obtain 10 ppm available chlorine.

Add more product to the water if the available chlorine level is below 1 ppm after 5 minutes. Return fish to pond after the available chlorine level reaches zero.

FISH POND EQUIPMENT - Thoroughly clean all equipment prior to treatment. Thoroughly mix 2 oz. of this product to 10 gallons of water to obtain 200 ppm available chlorine. Porous equipment should soak for one hour.

MAINE LOBSTER PONDS - Remove lobsters, seaweed etc. from ponds prior to treatment. Drain the pond. Thoroughly mix 6,200 oz. of this product to 10,000 gallons of water to obtain at least 600 ppm available chlorine. Apply so that all barrows, gates, rock and dam are treated with product. Permit high tide to fill the pond and then close gates. Allow water to stand for 2 to 3 days until the available chlorine level reaches zero. Open gates and allow 2 tidal cycles to flush the pond before returning lobsters to pond.

CONDITIONING LIVE OYSTERS - Thoroughly mix 5 oz. of this product to 10,000 gallons of water at 50 to 70°F to obtain 0.5 ppm available chlorine. Expose oysters to this solution for at least 15 minutes, monitoring the available chlorine level so that it does not fall below 0.05 ppm. Repeat entire process if the available chlorine level drops below 0.05 ppm or the temperature falls below 50°F.

CONTROL OF SCAVENGERS IN FISH HATCHERY PONDS - Prepare a solution containing 200 ppm of available chlorine by mixing 2 oz. of product with 10 gallons of water. Pour into drained pond potholes. Repeat if necessary. Do not put desirable fish back into refilled ponds until chlorine residual has dropped to 0 ppm, as determined by a test kit.

SANITIZATION OF DIALYSIS MACHINES

Flush equipment thoroughly with water prior to using this product. Thoroughly mix 6 oz. of this product to 10 gallons of water to obtain at least 600 ppm available chlorine. Immediately use this product in the hemodialysate system allowing for a minimum contact time of 15 minutes at 20°C. Drain system of the sanitizing solution and thoroughly rinse with water. Discard and DO NOT reuse the spent sanitizer. Rinsate must be monitored with a suitable test kit to insure that no available chlorine remains in the system.

This product is recommended for decontaminating single and multipatient hemodialysate systems. This product has been shown to be an effective disinfectant (virucide, fungicide, bactericide, pseudomonicide) when tested by AOAC and EPA test methods. This product may not totally eliminate all vegetative microorganisms in hemodialysate delivery systems due to their construction and/or assembly, but can be relied upon to reduce the number of microorganisms to acceptable levels when used as directed. This product should be used in a disinfectant program which includes bacteriologic monitoring of the hemodialysate delivery system. This product is NOT recommended for use in hemodialysate or reverse osmosis (RO) membranes.

Consult the guidelines for hemodialysate systems which are available from the Hepatitis Laboratories, CDC, Phoenix, AR 85021.

ASPHALT OR WOOD ROOFS AND SIDINGS

To control fungus and mildew, first remove all physical soil by brushing and hosing with clean water, and apply a 5000 ppm available chlorine solution. Mix 5 oz. of this product per gallon of water and brush or spray roof or siding. After 30 minutes, rinse by hosing with clean water.

BOAT BOTTOMS

To control slime on boat bottoms, sling a plastic tarp under boat, retaining enough water to cover the fouled bottom area, but not allowing water to enter enclosed area. This envelope should contain approximately 500 gallons of water for a 14 foot boat. Add 18 oz. of this product to this water to obtain a 35 ppm available chlorine concentration. Leave immersed for 8 to 12 hours. Repeat if necessary. Do not discharge the solution until the free chlorine level has dropped to 0 ppm, as determined by a swimming pool test kit.

ARTIFICIAL SAND BEACHES

To sanitize the sand, spray a 500 ppm available chlorine solution containing 5 oz. of this product per 10 gal. of water at frequent intervals. Small areas can be sprinkled with a watering can.

TOILET BOWL SANITIZERS

[These products are marketed as individual packages for placement in the toilet. Therefore, use directions are not appropriate.]

[Claims are limited to sanitization. No claims for disinfection are permitted.]

PRODUCT NAME

ACTIVE INGREDIENT:

Calcium Hypochlorite.....70%

INERT INGREDIENTS:.....35%

KEEP OUT OF REACH OF CHILDREN

DANGER

STATEMENT OF PRACTICAL TREATMENT (FIRST AID)^{6/}

IF CONTACT WITH EYES OCCURS, flush with cold water for at least 15 minutes. Get medical attention.

IF CONTACT WITH SKIN, brush off excess chemical and flush skin with cold water for at least 15 minutes. If irritation persists, get medical attention.

IF SWALLOWED, feed bread soaked in milk, followed by olive oil or cooking oil. DO NOT induce vomiting. Call a physician immediately.

(See additional precautions on side panel.)

Manufactured by:
ABC Chemical Corporation
P.O. Box 99
New York, New York
99999

EPA REG NO. 10237-20004
NET CONTENTS:

EPA EST 10237-KS-1

^{6/} It is only suggested that First Aid statements be placed on the front panel. If placed on another panel (e.g. the back panel), the label must have the referral statement, "See other precautions on back panel".

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER: Highly corrosive. Causes skin and eye damage. May be fatal if swallowed. Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling this product. Irritating to nose and throat. Avoid breathing dust. Remove and wash contaminated clothing before reuse.

ENVIRONMENTAL HAZARDS

This product is toxic to fish. Do not discharge into lakes, streams, ponds or public waterways unless in accordance with a NPDES permit. For guidance, contact the regional office of the U.S. Environmental Protection Agency.

PHYSICAL OR CHEMICAL HAZARDS

STRONG OXIDIZING AGENT: Mix only with water. Use clean dry utensils. Do not add this product to any dispensing device containing remnants of any other product. Such use may cause a violent reaction leading to fire or explosion. Contamination with moisture, organic matter or other chemicals will start a chemical reaction and generate heat, chlorine gas (and possible fire and explosion). In case of contamination or decomposition, do not reseal container. If possible, isolate container in open air or well ventilated area. Flood area with large volumes of water, if necessary.

MANUFACTURING-USE ONLY

For manufacturing-use only in the formulation of end-use products intended as:

- ° sanitizers of surfaces (e.g. wooden butcher blocks, stainless steel tops, concrete floors, tile walls); or
- ° sanitizers of commercial and household laundry; or
- ° agents to help control microorganisms on mushrooms (pins), potatoes, sweet potatoes (postharvest), pimento and tomato seeds, pecans, fish fillets, refining sugar; or
- ° agents to help control microorganisms on eggs for human consumption; or
- ° disinfectants of poultry drinking water; or
- ° disinfectants of human drinking water (emergency/public/individual), swimming pool water, hubbard/immersion tank water, spas/hot tub, hydrotherapy pools, human drinking water systems (e.g. water mains); or
- ° disinfectants of nonporous hard surfaces (e.g. tile, glass, stainless steel, fibreglass); or
- ° agents to help control microorganisms in sewage, wastewater, industrial and pulp and paper process water systems; or
- ° algicides/slimicides in cooling towers or evaporative condensers; or
- ° sanitizers of dialysis machines; or
- ° sanitizers of toilet bowls; or
- ° agents to help control algae and bacteria in fish and lobster ponds/tanks and conditioning oysters; or
- ° agents to help control slime on boat bottoms; or
- ° agents to sanitize and deodorize artificial sand beaches; or
- ° agents to kill scavenger fish in fish hatchery ponds.

Reformulators and repackagers of this product must obtain their own registrations from the Environmental Protection Agency.

[NOTE - IF MANUFACTURING-USE IS SPECIFIED ON THE LABEL, NO END-USE DIRECTIONS MAY APPEAR ON THE LABEL.]

PRODUCT NAME

ACTIVE INGREDIENT:

Calcium Hypochlorite.....12.5%

INERT INGREDIENTS:.....87.5%

KEEP OUT OF REACH OF CHILDREN

DANGER

STATEMENT OF PRACTICAL TREATMENT (FIRST AID)^{6/}

IF CONTACT WITH EYES OCCURS, flush with water for at least 15 minutes. Get prompt medical attention.

IF CONTACT WITH SKIN OCCURS, wash with plenty of soap and water.

IF SWALLOWED, drink large quantities of milk or gelatin solution, if these are not available, drink large quantities of water. DO NOT give vinegar or other acids. DO NOT induce vomiting. Get prompt medical attention.

(See additional precautions on side panel.)

Manufactured by:
ABC Chemical Corporation
P.O. Box 99
New York, New York
99999

EPA REG NO. 10237-20005
NET CONTENTS:

EPA EST 10237-KS-1

^{6/} It is only suggested that First Aid statements be placed on the front panel. If placed on another panel (e.g. the back panel), the label must have the referral statement, "See other precautions on back panel".

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER: Corrosive, may cause severe skin and eye irritation or chemical burns to broken skin. Causes eye damage. Wear face shield 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 product is toxic to fish. Do not discharge into lakes, streams, ponds or public waterways unless in accordance with a NPDES permit. For guidance, contact the regional office of the U.S. Environmental Protection Agency.

PHYSICAL OR 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.

MANUFACTURING-USE ONLY

For manufacturing-use only in the formulation of end-use products intended as:

- ° sanitizers of surfaces (e.g. wooden butcher blocks, stainless steel tops, concrete floors, tile walls); or
- ° sanitizers of commercial and household laundry; or
- ° agents to help control microorganisms on mushrooms (pins), potatoes, sweet potatoes (postharvest), pimento and tomato seeds, pecans, fish fillets, refining sugar; or
- ° agents to help control microorganisms on eggs for human consumption; or
- ° disinfectants of poultry drinking water; or
- ° disinfectants of human drinking water (emergency/public/individual), swimming pool water, hubbard/immersion tank water, spas/hot tub, hydrotherapy pools, human drinking water systems (e.g. water mains); or
- ° disinfectants of nonporous hard surfaces (e.g. tile, glass, stainless steel, fibreglass); or
- ° agents to help control microorganisms in sewage, wastewater, industrial and pulp and paper process water systems; or
- ° algicides/slimicides in cooling towers or evaporative condensers; or
- ° sanitizers of dialysis machines; or
- ° sanitizers of toilet bowls; or
- ° agents to help control algae and bacteria in fish and lobster ponds/tanks and conditioning oysters; or
- ° agents to help control slime on boat bottoms; or
- ° agents to sanitize and deodorize artificial sand beaches; or
- ° agents to kill scavenger fish in fish hatchery ponds.

Reformulators and repackagers of this product must obtain their own registrations from the Environmental Protection Agency.

[NOTE - IF MANUFACTURING-USE IS SPECIFIED ON THE LABEL, NO END-USE DIRECTIONS MAY APPEAR ON THE LABEL.]

PRODUCT NAME

ACTIVE INGREDIENT:

Sodium Hypochlorite.....12.5%

INERT INGREDIENTS:.....87.5%

KEEP OUT OF REACH OF CHILDREN

DANGER

STATEMENT OF PRACTICAL TREATMENT (FIRST AID)^{6/}

IF CONTACT WITH EYES OCCURS, flush with water for at least 15 minutes. Get prompt medical attention.

IF CONTACT WITH SKIN OCCURS, wash with plenty of soap and water.

IF SWALLOWED, drink large quantities of milk or gelatin solution, if these are not available, drink large quantities of water. DO NOT give vinegar or other acids. DO NOT induce vomiting. Get prompt medical attention.

(See additional precautions on side panel.)

Manufactured by:
ABC Chemical Corporation
P.O. Box 99
New York, New York
99999

EPA REG NO. 10237-20006

EPA EST 10237-KS-1

NET CONTENTS:

^{6/} It is only suggested that First Aid statements be placed on the front panel. If placed on another panel (e.g. the back panel), the label must have the referral statement, "See other precautions on back panel".

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER: Corrosive, may cause severe skin and eye irritation or chemical burns to broken skin. Causes eye damage. Wear face shield 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 product is toxic to fish. Do not discharge into lakes, streams, ponds or public waterways unless in accordance with a NPDES permit. For guidance, contact the regional office of the U.S. Environmental Protection Agency.

PHYSICAL OR 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.

MANUFACTURING-USE ONLY

For manufacturing-use only in the formulation of end-use products intended as:

- ° sanitizers of surfaces (e.g. wooden butcher blocks, stainless steel tops, concrete floors, tile walls); or
- ° sanitizers of commercial and household laundry; or
- ° agents to wash or assist in lye peeling of fruits and vegetables; or
- ° agents to help control microorganisms on eggs for human consumption; or
- ° disinfectants of poultry drinking water; or
- ° disinfectants of human drinking water (emergency/public/individual), swimming pool water, hubbard/immersion tank water, spas/hot tub, hydrotheraphy pools, human drinking water systems (e.g. water mains); or
- ° disinfectants of nonporous hard surfaces (e.g. tile, glass, stainless steel, fibreglass); or
- ° agents to help control microorganisms in sewage, wastewater, industrial and pulp and paper process water systems; or
- ° algicides/slimicides in cooling towers or evaporative condensers; or
- ° sanitizers of dialysis machines; or
- ° sanitizers of toilet bowls; or
- ° agents to help control algae and bacteria in fish and lobster ponds/tanks and conditioning oysters; or
- ° agents to help control slime on boat bottoms; or
- ° agents to sanitize and deodorize artificial sand beaches; or
- ° agents to kill scavenger fish in fish hatchery ponds.

Reformulators and repackagers of this product must obtain their own registrations from the Environmental Protection Agency.

[NOTE - IF MANUFACTURING-USE IS SPECIFIED ON THE LABEL, NO END-USE DIRECTIONS MAY APPEAR ON THE LABEL.]

J. Sample Statement of Certification

One of the following two certification statements must be submitted to the Agency. Note that a separate statement must be submitted for sodium hypochlorite and calcium hypochlorites.

1. CERTIFICATION FOR GENERAL REGISTRATION WITH FORMULATOR EXEMPTION

Director
Registration Division (TS-767)
Office of Pesticide Programs (Attn: PM 32)
The U.S. Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

Sir:

In accordance with the Sodium and Calcium Hypochlorites Registration Standard, I am applying for a General Registration/Reregistration for pesticide products containing (insert sodium or calcium) hypochlorite as a single active ingredient as specified in the standard. I hereby incorporate the above-mentioned standard as part of my application for registration/reregistration. I hereby request that all products marketed under this general registration be classified for general use.

I certify that all products marketed under this standard are or will be end-use products and contain the active ingredient (insert sodium or calcium hypochlorite) solely as the result of the incorporation into the product (during formulation or packaging) of another product which contains that active ingredient. This starting material is registered under FIFRA section 3, and is purchased by us from another producer. I understand that if at any time this exemption is no longer applicable, I will offer to pay compensation to the appropriate additional firms and submit a revised certification to the Agency prior to shipment of any end-use product not made from a registered product.

I certify that any quantity of this product which I distribute, sell, offer for sale, hold for sale, ship, deliver, deliver for shipment, or receive and (having so received) deliver or offer to deliver will comply with the conditions specified in the above-mentioned general registration standard as amended on the date of this submission. I understand, and agree on behalf of my firm, that if at any time any portion of this certification is no longer true, or if my firm fails to comply with the statements made in this certification, my firm's products registered under this certification may be cancelled in accordance with FIFRA section 6(b)(1).

Sincerely,

Name:
Title:
Address of Applicant:
Dated:

Name(s) and Address(es) of
any other person(s)
appearing on the label(s):

2. CERTIFICATION FOR GENERAL REGISTRATION WITHOUT FORMULATOR EXEMPTION

Director
Registration Division (TS-767)
Office of Pesticide Programs (Attn: PM 32)
The U.S. Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

Sir:

In accordance with the Sodium and Calcium Hypochlorites Registration Standard, I am applying for a General Registration/Reregistration for pesticide products containing (insert sodium or calcium) hypochlorite as a single active ingredient, as specified in the standard. I hereby incorporate the above-mentioned standard as part of my application for registration/reregistration. I hereby request that all products marketed under this general registration be classified for general use.

I certify in compliance with 40 CFR 162.3(d) that I have notified in writing the companies who have submitted data upon which I have relied to support my application, as specified in the standard and that I have offered to:

1. pay compensation for those data in accordance with sections 3(c)(1)(D) and 3(c)(2)(D) of the Federal Insecticide, Fungicide and Rodenticide Act, as amended; and
2. commence negotiations to determine which data are subject to the compensation requirements of FIFRA, and the amount and terms of compensation due, if any.

I certify that any quantity of this product which I distribute, sell, offer for sale, hold for sale, ship, deliver, deliver for shipment, or receive and (having so received) deliver or offer to deliver will comply with the conditions specified in the above-mentioned general registration standard as amended on the date of this submission.

I understand, and agree on behalf of my firm, that if at any time any portion of this certification is no longer true, or if my firm fails to comply with the statements made in this certification, my firm's products registered under this certification may be cancelled in accordance with FIFRA section 6(b)(1).

Sincerely,

Name:
Title:
Address of Applicant:
Dated:

Name(s) and Address(es) of
any other person(s)
appearing on the label(s):

REGISTRATION NUMBER CROSSWALK

This attachment is to be used only by registrants who: (1) have products currently registered with the Agency, (2) wish to reregister their products using the standard labeling in the Hypochlorite Salts Registration Standard.

The following currently registered products, which are to be reregistered under this standard, will now be assigned the following general registration numbers.

PAST EPA REG. NO.	PERCENTAGE ACTIVE INGREDIENT	NEW GENERAL REGISTRATION NUMBER
1. _____ _____	_____	1. _____-20001
2. _____ _____	_____	2. _____-20002
3. _____ _____	_____	3. _____-20003

EXAMPLE: The ABC Chemical Corporation (company number 10237) has six hypochlorite products and wants five of these products to be converted to General Registration process. Five products will be assigned new General Registration numbers and all five of the old EPA Reg. Numbers will be retired. The sixth product, which must undergo the product specific review process to confirm the label claims, will not appear on the form below.

PAST EPA. REG. NO.	PERCENTAGE ACTIVE INGREDIENT	NEW GENERAL REGISTRATION NUMBER
1. 10237-4	65.00 % A.I. Calcium Hypochlorite	1. 10237-20001
10237-2	70.00 % A.I. Calcium Hypochlorite	
10237-9	50.00 % A.I. Calcium Hypochlorite	
10237-11	30.00 % A.I. Calcium Hypochlorite	
2. none		2. 10237-20002
3. 10237-6	6.00 % A.I. Sodium Hypochlorite	3. 10237-20003

OFFICE OF PESTICIDE PROGRAMS
REGISTRATION STANDARD BIBLIOGRAPHY
Citations Considered to be Part of the Data Base Supporting
Registrations Under the Standard

CASE GS0029

MIRD CITATION

- GS0029078 Allied Chemical Corporation (1974) A Practical Guide to Chlorine Bleach Making. Technical and Engineering Service Bulletin 72-19. Industrial Chemicals Division. Morristown, NJ
- GS0029060 Allison, V.D; Baird, T.T.; Black, J.A.; Carey, G.C.R.; Dunbar, J.M.; Fraser, K.B.; Gibson, G.L.; Shepard, W. (1971) Infection in Hospital - A code of Practice. G.L. Gibson edit. E. & S. Livingstone publ. Edinburgh and London
- GS0029059 American Hospital Association (1974) Infection Control in the Hospital. third edit. published by AHA Chicago, Illinois 60611
- GS0029058 American Public Health Association (1964) Suggested Ordinance and Regulations Covering Public Swimming Pools. APHA New York, NY
- GS0029057 American Public Health Association/ American Water Works Association/ Water Pollution Control Federation (APHA/AWWA/WPCF) (1976) Standard Methods for the Examination of Water and Wastewater. 14th edit.
- GS0029071 Analytical Reference Service (1969) Study Number 35 Environmental Protection Agency
- GS0029072 Analytical Reference Service (1971) Study Number 40 Environmental Protection Agency
- GS0029067 Anderson, J.R. (1965) A Study of the Influence of Cyanuric Acid on the Bactericidal Effectiveness of Chlorine. American Journal of Public Health 55(10): 1629-1637.
- 005002173 Audia, W.V.; Preston, W.H., Jr. (1965) The effects of several algaecides on aquatic plants. Pages 451-455, In Proceedings of the Nineteenth Annual Meeting of the Northeastern Weed Control Conference. Farmingdale, N.Y.: Northeastern Weed Control Conference.
- 000007398 Babish, J.G. (1978) Report: Acute Dermal Toxicity Study in Rabbits. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by Food and Drug Research Laboratories, Inc., submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236802-C)

- 000007399 Babish, J.G. (1978) Report: Approximate Acute Oral Toxicity (LD₅₀) in Rats. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by Food and Drug Research Laboratories, Inc., submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236802-F)
- 000007397 Babish, J.G. (1978) Report: Approximate Acute Oral Toxicity (LD₅₀) in Rats. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by Food and Drug Research Laboratories, Inc., submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236802-B)
- 000008204 Babish, J.G. (1978) Report: Eye Irritation Test in Rabbits with Fluorescein. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by Food and Drug Research Laboratories, Inc., submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236802-E)
- 000008206 Babish, J.G. (1978) Report: Eye Irritation Tests in Rabbits with Fluorescein. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by Food and Drug Research Laboratories, Inc., submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236802-H)
- 000008203 Babish, J.G. (1978) Report: Primary Skin Irritation Study with Rabbits. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by Food and Drug Research Laboratories, Inc., submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236802-D)
- 000008205 Babish, J.G. (1978) Report: Primary Skin Irritation Study with Rabbits. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by Food and Drug Research Laboratories, Inc., submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236802-G)
- 000008202 Baker, R.G. (1974) Report to Olin Corporation: Primary Skin Irritation Test with Mildew Rid in Albino Rabbits: IBT No. 601-05594. (Unpublished study received Mar 3, 1975 under 1258-161; prepared by Industrial Bio-Test Laboratories, Inc., submitted by Olin Corp., Stamford, Conn.; CDL:233785-B)
- 000007374 Baker, R.G. (1976) Report to Jones Chemicals, Inc.: Acute Toxicity Studies with Sodium hypochlorite, Sunny Sol 150: IBT No. 8530-09248. (Unpublished study received Sep 7, 1976 under 1744-2; prepared by Industrial Bio-Test Laboratories, Inc., submitted by Jones Chemicals, Inc., Caledonia, N.Y., CDL:225754-A)
- GS0029045 Bass, M.; Heath, A. (1977) Toxicity of intermittent chlorination to bluegill Lepomis macrochirus : interaction with temperature In Bulletin of Environmental Contamination and Toxicology 17(4):416-423.

- 000007496 Beavers, J.B. (1977) Final Report: Acute Oral LD₅₀ Bobwhite Quail: Project No. 133-107. (Unpublished study received Sep 8, 1977 under 1258-427; prepared by Wildlife Int., Ltd. in cooperation with Washington College and Maryland, Dept. of Agriculture, Div. of Inspection and Regulation, submitted by Olin Corp., Stamford, Conn.; CDL:231907-B)
- 000007276 Beavers, J.B. (1978) Final Report: Acute Oral LD₅₀ Bobwhite Quail: Project No. 156-103. (Unpublished study received Apr 4, 1978 under 35317-1; prepared by Wildlife International, Ltd., submitted by Kuehne Chemical Co., Inc., Cranford, N.J.; CDL:233388-B)
- 000007275 Beavers, J.B. (1978) Final Report: Eight-Day Dietary LC₅₀ Bobwhite Quail: Project No. 156-101. (Unpublished study received Apr 4, 1978 under 35317-1; prepared by Wildlife International, Ltd., submitted by Kuehne Chemical Co., Inc., Cranford, N.J.; CDL:233388-A).
- 000007278 Beavers, J.B. (1978) Final Report: Eight-Day Dietary LC₅₀ Mallard Duck: Project No. 156-102. (Unpublished study received Apr 28, 1978 under 35317-1; prepared by Wildlife International, Ltd., submitted by Kuehne Chemical Co., Inc., Cranford, N.J.; CDL:233598-A)
- 000007405 Beavers, J.B.; Brown, R. (1978) Final Report: Eight-Day Dietary LC₅₀—Bobwhite Quail: Project No. 158-101. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by Wildlife International, Ltd., submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236804-D)
- 000007403 Beavers, J.B.; Fink, R.; Grimes, J.; et al. (1978) Final Report: Acute Oral LD₅₀—Bobwhite Quail: Project No. 158-103. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by Wildlife International, Ltd. in cooperation with Washington College, submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236804-B)
- 000007404 Beavers, J.B.; Fink, R.; Grimes, J.; et al. (1978) Final Report: Eight-Day Dietary LC₅₀ Mallard Duck: Project No. 158-102. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by Wildlife International, Ltd. in cooperation with Washington College, submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236804-C)
- GS0029043 Beliles, R.P. (1975) Chapter 18 - Metals In Toxicology - The Basic Science of Poisons. edited by Casarett, L.J.; Doull, J. Macmillan Publishing Co., Inc. New York, New York
- GS0029052 Beloian, A.; Koski, T. (1964) Resistance of Pseudomonas to Various Chemical Germicides. Journal of the A.O.A.C. 47(5): 804-807.

- GS0029064 Belioan, A. (1977) Chapter 2 - Methods of Testing for Sterility and Efficacy of Sterilizers, Sporicides and Sterilizing Processes. In Disinfection, Sterilization, and Preservation, 2nd edit., S.S. Block, editor, Lea & Febiger, publishers, Philadelphia, PA
- GS0029019 Bombana, A.C.; de Paiva, J.G.; Alvares, S.; Antoniazzi, J.H. (1974) Inflammatory reaction of the rabbit eye following placement of some drugs used in endodontics. Rev. Assoc. Paul. Cir. Dent. Jul-Aug 28(4):216-223.
- 000007401 Buccafusco, R.J.; Hawes, M.; Stiefel, C.; et al. (1978) Acute Toxicity of Sodium hypochlorite to Bluegill (Lepomis macrochirus): Report No. BW-78-7-234. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by EG&G, Bionomics, submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236803-C)
- 000007495 Buccafusco, R.J.; LeBlanc, G.A. (1977) Acute Toxicity of HTH to Bluegill (Lepomis macrochirus), Rainbow Trout (Salmo gairdneri) and the Water Flea (Daphnia magna). (Unpublished study including letter dated Aug 15, 1977 from S.J. Barbee to R.L. Bertrand, received Sep 8, 1977 under 1258-427; prepared by EG&G, Bionomics, submitted by Olin Corp., Stamford, Conn.; CDL:231907-A)
- 000008190 Calmbacher, C.W. (1978) Acute Toxicity of Sodium hypochlorite Solution to the Bluegill Sunfish Lepomis macrochirus Rafinesque: UCES Proj. No. 11506-72-01. (Unpublished study received Apr 4, 1978 under 35317-1; prepared by Union Carbide Corp., submitted by Kuehne Chemical Co., Inc., Cranford, N.J.; CDL:233389-A)
- 000008191 Calmbacher, C.W. (1978) Acute Toxicity of Sodium hypochlorite Solution to the Rainbow Trout, Salmo gairdneri Richardson: UCES Proj. No. 11506-72-02. (Unpublished study received Apr 4, 1978 under 35317-1; prepared by Union Carbide Corp., submitted by Kuehne Chemical Co., Inc., Cranford, N.J.; CDL:233390-A)
- 000007588 Campanella, J.L. (1974) Laboratory Report: Sodium hypochlorite. (Unpublished study received Oct 1, 1974 under 1763-2; submitted by Fields Point Chemical, Inc., Providence, R.I.; CDL:239326-A)
- GS0029054 Campbell, W.E. (1977) Efficacy Review of Chlorine Literature dated May 18, 1977.
- GS0029024 Campt, D.D. (1980) Pesticide petition file 9E2241.
- 000022029 Cardinal Pools, Incorporated (1976) Sunny Sol 150: General Chemistry. Includes two undated methods. (Unpublished study received Jun 20, 1977 under 36245-2; prepared in cooperation with Allied Chemical Corp. and others; CDL:230707-A)

- GS0029076 Casarett, L.J. (1975) Chapter 9- Toxicology of the Respiratory System In Toxicology- The Basic Science of Poisons. edited by Casarett, L.J.; Doull, J. Macmillan Publishing Co., Inc., New York, New York.
- 005008338 Clancey, V.J. (1976) Fire hazards of calcium hypochlorite. Journal of Hazardous Materials 1:83-94.
- GS0029070 Clarke, N.; Hill, W. (1977) Disinfection of Drinking Water, Swimming Pool Water and Treated Sewage Effluents by N. Clarke and W. Hill (1977) pg. 705 In Disinfection, Sterilization and Preservation edit. by S. Block (1977), Lea and Febiger, publishers, Philadelphia, PA.
- 000007438 Dayton, C. (1968) Laboratory Progress Report. (Unpublished study received Oct 3, 1968 under 887-15; submitted by Bonewitz Chemical Services, Inc., Burlington, Iowa; CDL:122126-A)
- 000022028 Disco Chemical Corporation (1976) Sunny Sol 100: General Chemistry Requirements. Includes two undated methods. (Unpublished study received Jun 20, 1977 under 34803-1; prepared in cooperation with Allied Chemical Corp. and others; CDL:230702-A)
- 000020072 Drube, R. (1978) Acute Oral Toxicity, Acute Dermal Toxicity, Primary Skin Irritation and Corrosivity, Acute Eye Irritation Studies of Sodium Hypochlorite Solution C (Surchlor; Sur-Shock). (Unpublished study received July 18, 1979 under unknown admin. no.; prepared by Hill Top Research, Inc., submitted by Surpass Chem. Co., Inc., N.Y.; CDL:238938-B)
- GS0029065 Dychdala, G. (1977) Chapter 10 - Chlorine and Chlorine Compounds. In Disinfection, Sterilization, and Preservation, 2nd edit., S.S. Block, editor, Lea & Febiger, publishers, Philadelphia, PA
- GS0029044 Environmental Protection Agency (1976) Fish Kills by Pollution Fifteen-Year Summary 1961-1975 EPA-440/4-78-011 Office of Air and Water Programs, Monitoring and Data Support Division, Data Reporting Branch, Washington, D.C. 20460
- GS0029023 Environmental Protection Agency (1980) Ambient water quality criteria for chloroform. EPA 440/5-80-033. Office of Water Regulations and Standards, Criteria and Standards Division, Washington, D.C. 20460
- GS0029074 Environmental Protection Agency (1980) Summary of Reported Pesticide Incidents Involving Sodium Hypochlorite. Pesticide Incident Monitoring System Report No. 367, Health Effects Branch, Hazard Evaluation Division, Office of Pesticide Programs.

- GS0029075 Environmental Protection Agency (1980) Summary of Reported Pesticide Incidents Involving Calcium Hypochlorite. Pesticide Incident Monitoring System Report No. 393, Health Effects Branch, Hazard Evaluation Division, Office of Pesticide Programs.
- GS0029025 Environmental Protection Agency (1980) National interim primary drinking water regulations. Aug. 27, 1980.
- 000007281 Erwin, R. (1976) Physical and Chemical Properties of Sodium hypochlorite. (Unpublished study received May 13, 1977 under 38419-1; prepared by Erwin Chemical Laboratory, submitted by One Stop Pool Service, Miami, Fla.; CDL:230274-D)
- 000007461 Estep, C.L.; Teske, R.H. (1968) Acute Oral Administration of Pittchlor to Rats for Pittsburgh Plate Glass Company: Report R-547. (Unpublished study received May 6, 1968 under 748-138; prepared by Hill Top Research, Inc., submitted by PPG Industries, Inc., Chemical Div., Pittsburgh, Pa.; CDL:050201-B)
- GS0029047 Federal Register (1979) Regulations for the Enforcement of the Federal Insecticide, Fungicide and Rodenticide Act. Vol. 44 No. 48 pgs. 13019-13024.
- GS0029030 Federal Register (1980) Calcium hypochlorite; Exemption from Requirement of tolerance. Vol 45 no. 227 pg. 77077.
- GS0029048 Federal Register (1981) Pesticide Registration, Reregistration, and Classification Procedures; Clarification of Policies on Special Packaging. Vol 46 No. 41 pgs. 15104-15109.
- GS0029027 Federal Register (1981) Regulations for the enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act; Temporary exemption of nonliquid swimming pool chemicals from child-resistant packaging requirements. Vol 46 No. 135 pgs 36706-36707.
- GS0029020 Foa, V.; Locati, G. (1966) On two cases of pulmonary edema with unusual etiology: hydrochloric acid and commercial bleaches (sodium hypochlorite). Med. Lv. 57(11):655-661.
- 000007580 Goldhammer, R.E. (1973) Acute Inhalation in Rats: Acute Oral LD₅₀ in Rats: Eye Irritation in Rabbits: Dermal Irritation in Rabbits. (Unpublished study received July 2, 1973 under 1258-971; prepared by Biometric Testing, Inc., submitted by Olin Corp., Stamford, Conn.; CDL:239291-A)
- GS0029079 Gosselin, R.E.; Hodge, H.C.; Smith, R.P.; Gleason, M.N. (19__) Hypochlorite In Clinical Toxicology of Commercial Products - Acute Poisoning Fourth Edit. Williams & Wilkins Baltimore, MD

- 000007492 Gross, P. (1948) Acute Toxicity Study of Pittchlor. (Unpublished study received May 6, 1968 under 748-2; prepared by Industrial Hygiene Foundation of America, Inc., submitted by PPG Industries, Inc., Chemical Div., Pittsburgh, Pa.; CDL:220036-A)
- 000007269 Hachik Bleach Company (1977) General Chemistry. Includes two methods dated Jul 1977 entitled: Determination of excess Sodium hydroxid in bleach solutions and Determination of available chlorine in bleach solutions. (Unpublished study received May 15, 1978 under 7254-9; CDL:233981-A)
- GS0029056 Horowitz, W. (1980) Official Methods of the Association of Official Analytical Chemists. 13th edit. Published by the AOAC, Washington, D.C. 20044 pgs. 59-65.
- GS0029028 Householder, R.D. (1976) Determination of chlorine dioxide and calcium hypochlorite using diethyl-p-phentlene diamine (DPD). Unpublished study submitted by Olin under PP # 9E2241.
- GS0029029 Householder, R.D. (1976) Residues of calcium hypochlorite on vegetables dipped in aqueous calcium hypochlorite solution. Unpublished study submitted by Olin under PP # 9E2241.
- 005009600 Hussain, A.; Trudell, P.; Repta, A.J. (1970) Quantitative spectrophotometric methods for determination of sodium hypochlorite in aqueous solutions. Journal of Pharmaceutical Sciences 59(8):1168-1170.
- 005011175 Khanna, V.B.; Sharma, S.K.; Bhattacharya, A.K. (1970) An iodimetric method for the determination of available chlorine in bleaching powder. Indian Journal of Applied Chemistry 33(3):199-200.
- GS0029051 Koski, T.A.; Stuart, L.S.; Ortenzio, L.F. (1966) Comparison of Chlorine, Bromine and Iodine as Disinfectants for Swimming Pool Water. Applied Microbiology 14(2): 276-279.
- GS0029050 Koski, T.A.; Ortenzio, L.F.; Stuart, L.S. (1967) Effect of Algicidal Quarternaries on the Germicidal Activity of Chlorine on Swimming Pool Water. Applied Microbiology 15(6):1291-1295.
- 005014892 Kukielka, J.; Kupiec, S. (1975) Metody wytwarzania podchlorynu wapniowego Methods of producing calcium hypochlorite Przemysl Chemiczny. Chemical Industry. 54(4):219-224.
- 000007249 Latven, A.R. (1976) Sentry (30% Available Chlorine): Toxicology Report. (Unpublished study including letter dated May 13, 1976 from A.R. Latven to George R. Dychdala, received May 14, 1976 under 335-188; prepared by Pharmacology Research, Inc., submitted by Pennwalt Chemical Corp., Philadelphia, Pa.; CDL:227449-B)

- 000007248 Latven, A.R. (1976) Sentry (65% Available Chlorine): Toxicology Report. (Unpublished study including letter dated May 13, 1976 from A.R. Latven to George R. Dychdala, received May 14, 1976 under 335-188; prepared by Pharmacology Research, Inc., submitted by Pennwalt Chemical Corp., Philadelphia, Pa.; CDL:227449-B)
- 000007560 Lavenhar, S.R.; Palanker, A.L. (1975) Final Report: Acute Inhalation Toxicity in Rats. (Unpublished study received May 19, 1977 under 1258-427; prepared by Biometric Testing, Inc., submitted by Olin Corp., Stamford, Conn.; CDL:230229-J)
- GS0029049 Lawrence, C.A.; Seymour S.S. (1977) Disinfection, Sterilization and Preservation. Second Edit. Lea & Feibiger Publishers, PA. Pgs. 291-295.
- 00019313 LeBlanc, G.A. (1977) Acute Toxicity of Sodium hypochlorite Solution to the Water Flea (Daphnia magna): ICG/T-79-076. (Unpublished study received Dec 7, 1978 under 230-69; prepared by EG&G, Bionomics, submitted by FMC Corp., Industrial Chemical Group, Philadelphia, Pa.; CDL:236584-B)
- 000007402 LeBlanc, G.A.; Surprenant, D.C. (1978) Acute Toxicity of Sodium hypochlorite to the Water Flea (Daphnia magna): Report No. BW-78-7-206. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by EG&G, Bionomics, submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236803-D)
- 005009652 Mandell, H.C., Jr. (1971) A new calcium hypochlorite and a discriminatory test. Fire Technology 7(2):157-161.
- 000007498 Martin, H. (1961) Guide to the Chemicals Used in Crop Protection. 4th ed. By Univ. of Western Ontario, Pesticide Research Institute. :Canada, Dept. of Agriculture, Research Branch. (p. 27 only; Publication 1093; also In unpublished submission received Jan 26, 1965 under unknown admin. no.; submitted by Olin Corp., Stamford, Conn.; CDL:005734-B)
- 000007552 McGee, G.J.; Benton, J. (1976) Primary Eye Irritation. (Unpublished study received Feb 10, 1976 under 1258-161; prepared by McGee Laboratories, Inc., submitted by Olin Corp., Stamford, Conn.; CDL:239025-A)
- 000007261 McKenna, W.G. (1961) Lithium hypochlorite. (Unpublished study including letter dated May 22, 1961 from T.C. George to M.G. Herre, received Aug 24, 1971 under 7675-4; prepared by Association of American Railroads, submitted by Lithium Corp. of America, Gastonia, N.C.; CDL:009512-C)

- GS0029069 Mood, E.W. (1950) Effect of Free Chlorine and Combined Available Residual Chlorine upon Bacteria in Swimming Pools. American Journal of Public Health 40:459 In Disinfection of Drinking Water, Swimming Pool Water and Treated Sewage Effluents by N. Clarke and W. Hill (1977) pg. 705 In Disinfection, Sterilization and Preservation edit. by S. Block (1977), Lea and Febiger, publishers, Philadelphia, PA.
- 000007279 Morrissey, A.E. (1978) The Acute Toxicity of Sodium hypochlorite Solution to the Water Flea Daphnia magna (Straus): UCES Proj. No. 11506-72-03. (Unpublished study received Apr 28, 1978 under 35317-1; prepared by Union Carbide Corp., submitted by Kuehne Chemical Co., Inc., Cranford, N.J.; CDL:233599-A)
- 000007540 New England Testing Laboratory, Incorporated (1977) Certificate of Analysis; Analysis for: Oral LD50, Primary Dermal Irritation, Primary Eye Irritation, Dermal LD50. (Unpublished study received May 9, 1977 under 1763-2; submitted by Fields Point Chemical, Inc., Providence, R.I.; CDL:230000-A)
- GS0029068 Odlang, T.; Pflug, J. (1976) Sporocidal Properties of Chlorine Compounds; Applicability to Cooling Water for Canned Food. Journal of Milk Food Technology 39:493.
- GS0029053 Ortenzio, L.F. (1957) Report on Fungicides and Subculture Media: Available Chlorine Germicidal Equivalent Concentration Test. Journal of the A.O.A.C. 40(3): 755-758.
- 000007422 Ortenzio, L.F.; Stuart, L.S. (1959) The behavior of Chlorine-bearing organic compounds in the A.O.A.C. available Chlorine germicidal equivalent concentration test. Journal of the Association of Official Agricultural Chemists 42(3):630-633. (Also?In?unpublished submission received Dec 9, 1975 under 524-105; submitted by Monsanto Co., St. Louis, Mo.; CDL:236611-B)
- 000007264 Ortenzio, L.F.; Stuart, L.S. (1964) A standard test for efficacy of germicides and acceptability of residual disinfecting activity in swimming pool water. Journal of the Association of Official Agricultural Chemists 47(3):540-547. (Also In unpublished submission received Jan 22, 1971 under 7011-1; submitted by Aquabrom, West Lafayette, Ind.; CDL:007985-B)
- 000007285 Paa, H. (1977) Report to Allied-Chlorine: Acute Toxicity Studies with Sodium hypochlorite Solution: IBT No. 8530-10159. (Unpublished study received Feb 22, 1977 under 33458-5; prepared by Industrial Bio-Test Laboratories, Inc., submitted by Allied Chlorine and Chemical Products, Inc., Miami, Fla.; CDL:231463-A)
- 000007369 Paa, H. (1977) Report to Jones Chemicals, Incorporated: Acute Toxicity Studies with Sunny Sol 5.25% Bleach: IBT No. 8530-10145. (Unpublished study received Mar 23, 1977 under 1744-1; prepared by Industrial Bio-Test Laboratories, Inc., submitted by Jones Chemical, Inc., Caledonia, N.Y.; CDL:231821-A)

- 000007381 Palanker, A.L. (1975) Final Report: Acute Inhalation in Rats; Acute Oral LD₅₀ in Rats; Eye Irritation in Rabbits; Dermal Irritation in Rabbits; Acute Dermal Toxicity in Rabbits. (Unpublished study received Mar 3, 1975 under 1258-161; prepared by Biometric Testing, Inc., submitted by Olin Corp., Stamford, Conn.; CDL: 233785-A)
- GS0029061 Palin, A.T. (1973) Chemistry and Control of Modern Chlorination. published by LaMotte Chemical Products Company Chestertown, Maryland 21620
- 005001505 Palmer, C.M.; Maloney, T.E. (1955) Preliminary screening for potential algicides. Ohio Journal of Science LV(1):1-8.
- 000007250 Pennwalt Chemical Corporation (1969) Storage Stability Tests of Pennswim Sentry. (Unpublished study including letter dated Jul 25, 1969 from G.R. Dychdala to Harold G. Alford, received May 14, 1976 under 335-188; CDL:227449-D)
- GS0029021 Pfeiffer, E.H. (1978) Cocarcinogenicity of chlorine. WaBolu (Berlin) 3:129-136
- GS0029031 Popa, L.; Fagarasan, M.; Pop, E.; Popa, L. (1978) A case of lethal acute intoxication with sodium hypochlorite solution. CLUJUL MED. (Rumania) 51(1):58-60.
- GS0029073 Potts, A.M.; Gonasun, L.M. (1975) Chapter 13 - Toxicology of the Eye In Toxicology - The Basic Science of Poisons. edited by Casarett, L.J.; Doull, J. Macmillan Publishing Co., Inc. New York, New York
- 000007468 Pucci, L. (1977) Formula, Manufacturing Instructions, Finished Bulk Specifications and Assay Procedures for Lysol^(R) Brand Scouring Cream Formula # KAl-83. (Unpublished study received Apr 5, 1977 under 777-48; submitted by Lehn and Fink Products Corp., Montvale, N.J.; CDL:235038-A)
- 005012141 Ramaswamy, S.; Kalyanam, N. (1951) Preparation of calcium hypochlorite with 70-75 per cent available chlorine. Journal of Scientific and Industrial Research 10B:282-287.
- 000007221 Sanders, B.O. (1972) Skin and Eye Irritation on 15 + 24 Germicidal Cleaner. (Unpublished study received Aug 30, 1972 under 38-13; prepared by Missouri Analytical Laboratories, Inc., submitted by Sinclair Manufacturing Co., Carson, Calif.; CDL:000004-A)
- GS0029022 Sawyer, C.L.; McCarty, P.L. (1967) Chemistry for sanitary engineers second edit. McGraw-Hill Book Company New York, New York pgs. 363-371.

- 000007227 Schultz, H. (1978) Quality Control Laboratory Report: Report No. 9547-A. (Unpublished study received Apr 25, 1978 under 193-16; prepared in cooperation with Dow Chemical Co., submitted by Wonder Chemical Corp., Fairless Hills, Pa.; CDL:233827-I)
- 000007271 Schultz, H. (1978) Quality Control Laboratory Report: Report No. 9547-DD. (Unpublished study received May 30, 1978 under 7254-9; prepared by Wonder Chemical Corp., submitted by Hachik Bleach Co., Philadelphia, Pa.; CDL:235144-A)
- 000007378 Sperling, F. (1966) Results of Acute Oral (LD_{50}) Toxicity Test. (Unpublished study received Sep 22, 1966 under 1258-61; prepared by Foster D. Snell, Inc., submitted by Olin Corp., Stamford Conn.; CDL:050302-A)
- GS0029055 Stuart, L.S.; Bogusky, J.; Ortenzio, L.P.; Friedl, J.L. (1950) Chlorine Type Germicides for Disinfecting Previously Cleaned Surfaces. Soap and Sanitary Chemicals, Official Proceedings, 37th Annual Meeting, CSMA.
- GS0029066 Stuart, L.S.; Ortenzio, L.F. (1964) Swimming Pool Chlorine Stabilizers. Paper presented at the 50th midyear meeting of the Chemical Specialties Manufacturers Association, Chicago, May 19.
- 000007400 Stiefel, C.; Fratus, G.; Hawes, M.; et al. (1978) Acute Toxicity of Sodium hypochlorite to Rainbow Trout (Salmo gairdneri): Report No. BW-78-8-280. (Unpublished study received Jan 19, 1979 under unknown admin. no.; prepared by EG&G, Bionomics, submitted by Chlorine Institute, Inc., New York, N.Y.; CDL:236803-B)
- 000020071 Surpass Chemical Company, Incorporated (1978?) Basic Manufacturing Process of Surchlor and Sur-Shock. Includes two undated methods. (Unpublished study received Jul 18, 1979 under unknown admin. no.; CDL:238938-A)
- 005011199 Taylor, R.L. (1917) The effect of light on solutions of bleaching powder. Journal of the Society of Dyers and Colourists 33:246-250.
- GS0029026 Tobler, J.; Cohn, W.E.; Jolley, R.; Carpenter, J.; Ferguson, M.; Stair, D.; Sigmon, C.; Hinkle, C.; Mattice, J.; Middaugh, D.; Cumming, R. (1981) Ambient water quality criteria for chlorine (external review draft). Prepared by Science Applications, Inc. 800 Oak Ridge Turnpike Oakridge, TN for the U.S. EPA, Environmental Criteria and Assessment Office Cincinnati, Ohio. dated Jun 29.
- 005008744 Uehara, Y.; Uematsu, H.; Saito, Y. (1978) Thermal ignition of calcium hypochlorite. Combustion and Flame 32(1):85-94.

