



MATERIAL SAFETY DATA SHEET

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product Name: CALCIUM HYPOCHLORITE
Trade Name: HTH® DRY CHLORINE GRANULAR
Synonym(s):
Product Use: Sanitiser and Oxidiser, Water Treatment Chemical
Supplier Name: Argo International Ltd
Address: 9 St Benedicts St, Eden Terrace, Auckland
Telephone: +64 9 377 5061
Fax: +64 9 309 1992
Email: argo@argoint.co.nz
Website: Argoint.co.nz
Emergency Number(s): For advice, contact the National Poisons Centre
(New Zealand: Phone 0800 764 766) or a doctor

SECTION 2: HAZARDS IDENTIFICATION

HSNO Classifications: 5.1.1B, 6.1D, 8.1A, 8.2B, 8.3A, 9.1A, 9.2A, 9.3C.

GHS Classifications

Oxidizing solids	Category 2.
Acute toxicity (Oral)	Category 4.
Skin corrosion	Category 1B.
Serious eye damage	Category 1.
Acute toxicity (Inhalation)	Category 3.
Specific target organ toxicity - single exposure	Category 3.

Signal word: Danger.

Hazard statements: H272 May intensify fire; oxidiser.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H331 Toxic if inhaled.
H335 May cause respiratory irritation.

Precautionary statements:

Prevention:

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220 Keep/Store away from clothing/combustible materials.
P221 Take any precaution to avoid mixing with combustibles.
P260 Do not breathe vapours.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/eye protection/ face protection.

Response:

P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

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P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a POISON CENTER or doctor/ physician.

P363 Wash contaminated clothing before reuse.

P370 + P378 In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

Disposal:

P501 Dispose of contents/container in accordance with local regulation.

Other hazards: None known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

CAS OR CHEMICAL NAME	CAS #	% RANGE
CALCIUM HYPOCHLORITE	7778-54-3	60 - 80
SODIUM CHLORIDE	7647-14-5	10 - 20
CALCIUM CHLORATE	10137-74-3	0-5
CALCIUM CHLORIDE	10043-52-4	0-5
CALCIUM HYDROXIDE	1305-62-0	0-4
CALCIUM CARBONATE	471-34-1	0-5
Water	7732-18-5	5.5 -10

SECTION 4: FIRST AID MEASURES

Eyes:	Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Call a physician at once.
Skin:	Immediately flush with water for at least 15 minutes. Call a physician. If clothing comes in contact with the product, it should be removed immediately and laundered before reuse.
Ingestion:	Immediately drink large quantities of water. Do NOT induce vomiting. Call a physician at once. Do NOT give anything by mouth if the person is unconscious or if having convulsions.
Inhalation:	Remove victim to fresh air. Support respiration if needed. Call a physician.



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SECTION 5: FIRE FIGHTING MEASURES

Use water to cool containers exposed to fire.

Personal Protection for Fire Fighting: Response to this material requires the use of a full encapsulated suit and a NIOSH approved positive pressure supplied air respirator.

Other: Do not use dry extinguishers containing Ammonium compounds.

SECTION 6: ACCIDENTAL RELEASE MEASURES

For all Transportation Accidents, call CHEMTREC at 800-424-9300.

Reportable Quantity: 10 lbs. (as Calcium Hypochlorite) Per 40 CFR 302.4.

Spill Mitigation Procedures: Hazardous concentrations in air may be found in local spill area and immediately downwind. Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel.

Air Release: Vapours may be suppressed by the use of a water fog. All water utilised to assist in fume suppression, decontamination or fire suppression may be contaminated and must be contained before disposal and/or treatment.

Water Release: This material is heavier than water. This material is soluble in water. Monitor all exit water for available Chlorine and pH. Advise local authorities of any contaminated water release.

Land Spill: Contact at 1-800-654-6911 immediately.
Danger: All spills of this product should be treated as contaminated. Contaminated product may initiate a chemical reaction which may spontaneously ignite any combustible material present, resulting in a fire of great intensity. In case of a spill, separate all spilled product from packaging, debris and other material. Using a clean broom or shovel, place all spilled product into plastic bags, and place those bags into a clean, dry disposal container, properly marked and labelled. Disposal containers made of plastic or metal are recommended. Do not seal disposal containers tightly. Immediately remove all product in disposal containers to an isolated area outdoors. Place all damaged packaging material in a disposal container of water to assure decontamination (i.e. removal of all product) before disposal. Place all undamaged packaging in a clean, dry container properly marked and labelled. Call for disposal procedures.

Spill Residues: Dispose of per guidelines under Section 13, Waste Disposal.
This material may be neutralised for disposal; you are requested to contact 800-654-6911 before beginning any such operation.

Personal Protection for Emergency Spill: Response to this material requires the use of a full encapsulated suit and a NIOSH approved positive pressure supplied air respirator.

SECTION 7: HANDLING AND STORAGE

Do not take internally. Avoid inhalation of dust and fumes. Avoid contact with eyes, skin or clothing. Upon contact with skin or eyes, wash off with water. Remove and wash contaminated clothing before reuse.

Handling: Avoid inhalation of dust and fumes. Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water. Remove contaminated clothing and wash before reuse.

Storage: Keep product tightly sealed in original containers. Store product in a cool, dry, well-ventilated area. Store away from combustible or flammable products. Keep product packaging clean and free of all



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Shelf Life Limitations:

contamination, including, e.g. other pool treatment products, acids, organic materials, Nitrogen-containing compounds, dry powder fire extinguishers (containing Mono-ammonium Phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc.

Do not store product where the average daily temperature exceeds 95° F. Storage above this temperature may result in rapid decomposition, evolution of chlorine gas and heat sufficient to ignite combustible products. Shelf life (that is, the period of time before the product goes below stated label strength) is determined by storage time and temperatures. Store in a cool, dry and well ventilated area. Prolonged storage at elevated temperatures will significantly shorten the shelf life. Storage in a climate controlled storage area or building is recommended in those areas where extremes of high temperature occur. Do not store product where the average daily temperature exceeds 95° F. Storage above this temperature may result in rapid decomposition, evolution of chlorine gas and heat sufficient to ignite combustible products. Shelf life (that is, the period of time before the product goes below stated label strength) is determined by storage time and temperatures. Store in a cool, dry and well ventilated area. Prolonged storage at elevated temperatures will significantly shorten the shelf life. Storage in a climate controlled storage area or building is recommended in those areas where extremes of high temperature occur., Average daily temperature of 35° C / 95° F. Storage above this temperature may result in rapid decomposition, evolution of Chlorine gas and heat sufficient to ignite combustible products.

Incompatible Materials for Storage: Do not allow product to come in contact with other materials, including e.g. other pool treatment products, acids, organic materials, Nitrogen-containing compounds, dry powder fire extinguishers (containing Mono-ammonium Phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc. A chemical reaction with such substances can cause a fire of great intensity. Do not allow product to come in contact with other materials, including e.g. other pool treatment products, acids, organic materials, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc. A chemical reaction with such substances can cause a fire of great intensity.

Do Not Store at Temperatures Above: Average daily temperature of 35° C / 95° F. Storage above this temperature may result in rapid decomposition, evolution of Chlorine gas and heat sufficient to ignite combustible products.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Ventilation: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to keep airborne exposures below the TLV, PEL or other recommended exposure limit.

Protective Equipment for Routine Use of Product

Respiratory Protection: Wear a NIOSH approved respirator if levels above the exposure limits are possible. Wear a NIOSH approved respirator if levels above the exposure

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	limits are possible., A NIOSH approved full-face air purifying respirator equipped with combination chlorine/P100 cartridges. Air purifying respirators should not be used in oxygen deficient or IDLH atmospheres or if exposure concentrations exceed ten (10) times the published limit.
Respirator Type:	A NIOSH approved full-face air purifying respirator equipped with combination chlorine/P100 cartridges. Air purifying respirators should not be used in oxygen deficient or IDLH atmospheres or if exposure concentrations exceed ten (10) times the published limit.
Skin Protection:	Wear impervious gloves to avoid skin contact. A full impervious suit is recommended if exposure is possible to a large portion of the body. A safety shower should be provided in the immediate work area.
Eye Protection:	Use chemical goggles. Emergency eyewash should be provided in the immediate work area.
Protective Clothing Type:	Neoprene, Nitrile, Natural rubber (This includes: gloves, boots, apron, protective suit).

Components with workplace control parameters

Components (CAS-No)	Value	Control Parameters	Basis (Update)
Calcium Hypochlorite (7778-54-3)	TWA	1 mg/m ³	ARCH OEL*
Calcium Hypochlorite (7778-54-3)	Conc	37-48 mg/m ³	HIOSH/GUIDE IDLH
Calcium Hydroxide (1305-62-0)	TWA	5 mg/m ³	ACGIH (02 2014)

ARCH OEL: Arch Recommended Occupational Exposure Guideline.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White, free flowing powder.
Freezing Point:	Not applicable.
Boiling Point:	Not applicable.
Decomposition Temperature:	Onset – approximately 170-180°C (338-356 Deg. F).
Specific Gravity:	Not applicable.
Bulk Density:	0.8 g/cc, loose.
pH @ 25°C:	10.4-10.8 (1% solution).
Vapour Pressure @ 25°C:	Not applicable.
Solubility in Water:	Approximately 18% @ 25°C. (Product also contains Calcium Hydroxide and Calcium Carbonate which will leave a residue.)
Volatiles, percent by volume:	Not applicable.
Evaporation Rate:	Not applicable.
Vapour Density:	Not applicable.
Molecular Weight:	143 (Active ingredient).
Odour:	Chlorine-like.
Coefficient of Oil/Water Distribution:	Not applicable.

SECTION 10: STABILITY AND REACTIVITY

Stability and Reactivity Summary: Product is not sensitive to mechanical shock or impact. Product is not sensitive to electrical static discharge. Product will not undergo hazardous polymerization. Product is an NFPA Class 3 oxidizer which can cause a severe increase in fire intensity. Not pyrophoric. Not an organic peroxide. If subjected to excessive temperatures, the product may undergo rapid decomposition, evolution of chlorine gas, and heat sufficient to ignite combustible

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	substances. If product is exposed to small amounts of water, it can react violently to produce heat and toxic gases and spatter. Use copious amounts of water for fires involving this product. Product will not undergo hazardous polymerization., NFPA Oxidizer Class: Meets the criteria of an NFPA Class 3 Oxidizer, Hazardous decomposition products formed under fire conditions.
Reactive Properties:	Product is not sensitive to mechanical shock or impact. Product is not sensitive to electrical static discharge. Not pyrophoric. Not an organic peroxide.
Conditions to Avoid:	Do not store next to heat source, in direct sunlight, or elevated storage temperature. Do not store where the daily average temperature exceeds 95 °F. Prevent ingress of humidity and moisture into container or package. Always close the lid.
Chemical Incompatibility:	This product is chemically reactive with many substances, including, e.g., other pool treatment products, acids, organics, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, corrosive, flammable or combustible materials. Do not allow product to contact any foreign matter, including other water treatment products. Contamination or improper use may cause a fire of great intensity, explosion or the release of toxic gases. If product is exposed to small amounts of water, it can react violently to produce heat and toxic gases and spatter.
Hazardous Decomposition Products:	Chlorine.
Decomposition Temperature:	170 - 180 °C -, 338 - 356 °F-

SECTION 11: TOXICOLOGICAL INFORMATION**Component Animal Toxicology****Oral LD50 value:**

CALCIUM HYPOCHLORITE	LD50 (65% Calcium Hypochlorite) 850 mg/kg Rat.
SODIUM CHLORIDE	LD50 = 3,000 mg/kg Rat.
CALCIUM CHLORIDE	LD50 = 1,000 mg/kg Rat.
CALCIUM HYDROXIDE	LD50 = 7,340 mg/kg Rat.

Component Animal Toxicology**Dermal LD50 value:**

CALCIUM HYPOCHLORITE	LD50 (65% Calcium Hypochlorite) > 2,000 mg/kg Rabbit.
SODIUM CHLORIDE	LD50 > 10,000 mg/kg Rabbit.
CALCIUM CHLORIDE	LD50 = 2,630 mg/kg Rat.
CALCIUM HYDROXIDE	No data.

Component Animal Toxicology**Inhalation LC50 value:**

CALCIUM HYPOCHLORITE	Inhalation LC50 1 h (65% Calcium Hypochlorate) (Nose Only) = 2.04 mg/l Rat. Inhalation LC50 4 h (65% calcium hypochlorite) (Nose Only) = 0.51 mg/l Rat.
SODIUM CHLORIDE	Inhalation LC50 1 h > 42 mg/l Rat.
CALCIUM CHLORIDE	No data.
CALCIUM HYDROXIDE	No data.



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Product Animal Toxicity

Oral LD50 value:	LD50 Approximately 800 mg/kg Rat.
Dermal LD50 value:	LD50 > 2,000 mg/kg Rabbit.
Inhalation LC50 value:	Inhalation LC50 1.00h (Nose only) > 2.04 mg/l Rat. Inhalation LC50 4 h (Nose only) > 0.51 mg/l Rat. LC50 1 h > 2.04 mg/l Rat. LC50 4 h > 0.51 mg/l Rat.

Skin Irritation: DRY MATERIAL CAUSES MODERATE SKIN IRRITATION, WET MATERIAL CAUSES SKIN BURNS.

Eye Irritation: Corrosive to eyes.

Skin Sensitisation: This material is not known or reported to be a skin or respiratory sensitiser.

Acute Toxicity: This product is corrosive to all tissues contacted and upon inhalation, may cause irritation to mucous membranes and respiratory tract. The dry material is irritating to the skin. However when wet, it will produce burns to the skin.

Subchronic/Chronic Toxicity: There are no known or reported effects from repeated exposure except those secondary to burns.

Reproductive and Developmental Toxicity: Calcium Hypochlorite has been tested for teratogenicity in laboratory animals. Results of this study have shown that Calcium Hypochlorite is not a teratogen.

CALCIUM CHLORIDE Not known or reported to cause reproductive or developmental toxicity.

Mutagenicity: Calcium Hypochlorite has been tested in the Dominant lethal assay in male mice, and it did not induce a dominant lethal response. Calcium hypochlorite has been reported to produce mutagenic activity in two in vitro assays. It has, however, been shown to lack the capability to produce mutations in animals based on results from the micronucleus assay. In vitro assays frequently are inappropriate to judge the mutagenic potential of bactericidal chemicals due to a high degree of cellular toxicity. The concentration which produces mutations in these in vitro assays is significantly greater than the concentrations used for disinfection. Based on high cellular toxicity in in vitro assays and the lack of mutagenicity in animals, the risk of genetic damage to humans is judged not significant.

CALCIUM CHLORIDE This product was determined to be non-mutagenic in the Ames assay. It was also shown to be non-clastogenic in the chromosomal aberration test.

Carcinogenicity: This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA. One hundred mice were exposed dermally 3 times a week for 18 months to a solution of calcium hypochlorite. Histopathological examination failed to show an increased incidence of tumors. IARC (International Agency for Research on Cancer) reviewed studies conducted with several Hypochlorite salts. IARC has classified Hypochlorite salts as having inadequate evidence for carcinogenicity to humans and animals. IARC therefore considers Hypochlorite salts to be not classifiable as to their carcinogenicity to humans (Group 3 Substance).

CALCIUM CHLORIDE This chemical is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.



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SECTION 12: ECOLOGICAL INFORMATION

Overview Highly toxic to fish and other aquatic organisms.

Ecological Toxicity Values for: CALCIUM HYPOCHLORITE

Bluegill – (nominal, static). 96 h LC50 0.088 mg/l.
Rainbow trout (Salmo Gaidneri) – (nominal, static). 96 h LC50 0.16 mg/l.
Daphnia magna – (nominal, static). 48 h LC50 0.11 mg/l.
Bobwhite quail – Dietary LC50 > 5,000 ppm.
Mallard ducklings – Dietary LC50 > 5,000 ppm.
Bobwhite quail – Oral LD50 3,474 mg/kg.

Ecological Toxicity Values for: CALCIUM CHLORIDE

Bluegill – (nominal, static). 96 h LC50 = 10,650 mg/l.
Mosquito Fish - (nominal, static). 96 h LC50 = 13,400 mg/l.
Pimephales (fathead minnow) - (nominal, static). 96 h LC50 = 4,630 mg/l.
Daphnia magna - (nominal, static). 48 h LC50 = 2770 mg/l.
Ceriodahnia dubia - (nominal, static). 48 h LC50 = 1830 mg/l.
Nitzschia linearis (diatom) - (nominal, static). 5 day LC50 = 3,130 mg/l.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Summary: If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number: D001.

If this product becomes a waste, it will be a hazardous waste which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly.

Disposal Methods: As a hazardous solid waste, it must be disposed of in accordance with local, state, and federal regulations.

Potential US EPA Waste Codes: D001.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THE MATERIAL. THE USER OF THE MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

SECTION 14: TRANSPORT INFORMATION

DOT

UN number: 2880.
Description of the goods: Calcium hypochlorite, hydrated mixtures.
Class: 5.1.
Packing group: II.
Labels: 5.1.
Emergency Response: 140.
Guidebook Number:

TDG

UN number: 2880.
Description of the goods: CALCIUM HYPOCHLORITE, HYDRATED MIXTURE.
Class: 5.1.



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Packing group: II.
Labels: 5.1.

IATA

UN number: 2880.
Description of the goods: Calcium hypochlorite, hydrated mixture.
Class: 5.1.
Packing group: II.
Labels: 5.1.
Packing instruction (cargo aircraft): 562.
Packing instruction (passenger aircraft): 558.
Packing instruction (passenger aircraft): Y544.

IMDG-CODE

UN number: 2880.
Description of the goods: CALCIUM HYPOCHLORITE, HYDRATED MIXTURE.
Class: 5.1.
Packing group: II.
Labels: 5.1.
EmS Number 1: F-H.
EmS Number 2: S-Q.

Marine pollutant: Yes.

SECTION 15: REGULATORY INFORMATION

New Zealand: This substance is classified as a hazardous substance in accordance with the Hazardous Substances (Minimum Degrees of Hazard) Regulations 2001.

Approval Number: HSR 001317.

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals.

Signal word: DANGER!
Hazard statements: Causes substantial but temporary eye injury.
Corrosive. Causes skin burns.
Corrosive. Causes irreversible eye damage.
This pesticide is toxic to fish.

EPCRA – Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sodium Hypochlorite	7778-54-3	10	

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.



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SARA 313:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
Clean Air Act:	This product does not contain any air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61). This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
Clean Water Act:	The following Hazardous Substances are listed under the U.S. Clean Water Act, Section 311, Table 116.4A: Calcium Hypochlorate 7778-54-3. The following Hazardous Chemicals are listed under the U.S. Clean Water Act, Section 311, Table 117.3: Calcium Hypochlorate 7778-54-3. This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307.

US State Regulations

Massachusetts Right To Know:	Calcium Hypochlorate	7778-54-3.
	Calcium Chlorate	10137-74-3.
	Calcium Dihydroxide	1305-62-0.
	Calcium Carbonate	471-34-1.
Pennsylvania Right To Know:	Calcium Hypochlorate	7778-54-3.
	Sodium Chloride	7647-14-5.
	Calcium Chlorate	10137-74-3.
	Calcium Chloride	10043-52-4.
	Calcium Dihydroxide	1305-62-0.
	Calcium Carbonate	471-34-1.
New Jersey Right To Know:	Calcium Hypochlorate	7778-54-3.
	Sodium Chloride	7647-14-5.
	Calcium Chlorate	10137-74-3.
	Calcium Chloride	10043-52-4.
	Calcium Carbonate	471-34-1.
	Calcium Dihydroxide	1305-62-0.

California Prop 65:	This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
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The components of this product are reported in the following inventories:

TSCA:	This chemical is for export only and thus, is not subject to TSCA regulations.
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Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TSCA (USA).

SECTION 16: OTHER INFORMATION

SECTIONS REVISED: 1, 14, 15.

Major References:

1. Ishidate, M. et al. (1984). Primary mutagenicity screening of food additives currently used in Japan. *Fd. Chem Toxicol.* 22:623-636.



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2. Hayashi, M. et al. (1988). Micronucleus tests in mice on 39 food additives and eight miscellaneous chemicals. *Fd. Chem. Toxicol.* 26:487-500.
3. Report on the Acute Inhalation in Rats, Acute Oral LD50 in Rats, Eye Irritation in Rabbits, Dermal Irritation in Rabbits, and Acute Dermal Toxicity in Rabbits of HTH. Biometric Testing Laboratories, Inc., Whippany, NJ. Experiment Reference #A-1490 (RC-30406), February 9, 1975.
4. Report on the Teratogenic Study with Calcium Hypochlorite in Albino Rats. Industrial Bio-Test Laboratories, Inc., Northbrook, IL. IBT #B758b, April 18, 1972.
5. Report on the Mutagenic Study with Monosodium Cyanurate and Calcium Hypochlorate (HTH) in Albino Mice. Industrial Bio-Test Laboratories, Inc., Northbrook, IL. IBT #E756. April 18 1972.
6. Chemical Hazard Summary No. 20: Calcium Hypochlorite. Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada L8N 1H6. December 1986.
7. Report on 18-month Dermal Carcinogenicity Study with Monosodium Cyanuric Acid and HTH in Swiss White Mice. Industrial Bio-Test Laboratories, Inc., Northbrook, IL IBT #651-00751, April 9, 1974.
8. Report to PPG Industries, Inc. on the Acute Toxicity Studies with PITCHLOR (Granular Calcium Hypochlorite). Industrial Bio-Test Laboratories, Inc., Northbrook, IL, IBT #601-06659, May 7, 1975.
9. Report on the Acute Toxicity of HTH to Blue gill, Rainbow Trout and the Water Flea. E G & G, Bionomics Aquatic Toxicology Laboratory, Wareham, MA, July 1977.
10. Report on the 8-Day Dietary LD50 Study with HTH in Mallard Ducklings. Industrial Bio-Test Laboratories, Inc., Northbrook, IL, IBT #651-06184, May 15 1975.
11. Report on the 8-Day Dietary LC50 with HTH in Bobwhite Quail. Industrial Bio-Test Laboratories, Inc., Northbrook, IL, IBT #651-06183.
12. Final Report on the Acute Oral LD50 of Calcium Hypochlorite in Bobwhite Quail. Wildlife International, LTD., Easton, MD, Project #133-107, July 1977.
13. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Vol. 52: Chlorinated Drinking Water; Chlorination By-Products; Some Other Halogenated Compounds; Cobalt and Cobalt Compounds. World Health Organization, International Agency for Research on Cancer (IARC), Lyon, France, 1991.
14. Sittig, Marshall, Handbook of Toxic and Hazardous Chemicals and Carcinogens, 2nd Ed., Noyes Publications, Park Ridge, NJ, 1985.
15. Chemical Hazard Response Information System (CHRIS), Vol. II, U.S. Coast Guard, Washington, D.C., 1984.
16. Chlorine and Your Health. The Chlorine Institute, Inc., Washington, D.C., August 1988.
17. ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition, 1991. American Conference of Governmental Industrial Hygienists, Inc., Cincinnati, OH.
18. Amoores, John E. and Earl Hautala, Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatiles for 214 Industrial Chemicals in Air and Water Dilution. *Journal of Applied Toxicology*, Vol. 3, No. 6, pp. 272-290, 1983.
19. Forsberg, K., and S.Z. Mansdorf, Quick Selection Guide to Chemical Protective Clothing, Second Edition, Van Nostrand Reinhold, N.Y., 1993.

Additional references are available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.



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ARGO INTERNATIONAL LTD
IMPORTERS & EXPORTERS

Disclaimer

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