

Pyrophosphoric acid

sc-250819



The Power to Question

Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

Pyrophosphoric acid

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

EMERGENCY

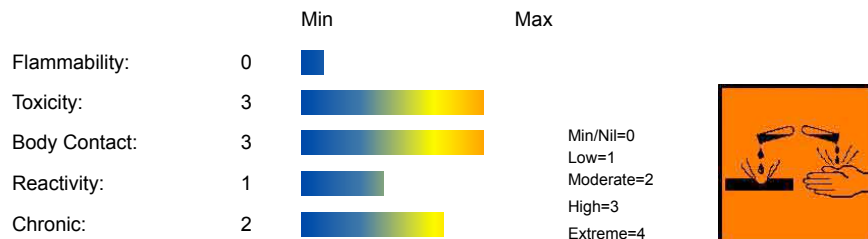
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS

H4-O7-P2, "diphosphoric acid", "phosphoric acid, pyro-mhu-oxido-bis(dihydroxidooxidophosphorus)"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS



CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Harmful if swallowed.

Causes burns.

Risk of serious damage to eyes.

May cause long-term adverse effects in the aquatic environment.

May cause long-term adverse effects in the environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

■ The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.

■ Ingestion of acidic corrosives may produce burns around and in the mouth.
the throat and esophagus.

■ As absorption of phosphates from the bowel is poor, poisoning this way is less likely.

Effects can include vomiting, tiredness, fever, diarrhea, low blood pressure, slow pulse, cyanosis, spasms of the wrist, coma and severe body spasms.

EYE

■ The material can produce chemical burns to the eye following direct contact.

Vapors or mists may be extremely irritating.

■ If applied to the eyes, this material causes severe eye damage.

■ Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns.

Mild burns of the epithelia generally recover rapidly and completely.

SKIN

■ The material can produce chemical burns following direct contact with the skin.

■ Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.

■ Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

■ Open cuts, abraded or irritated skin should not be exposed to this material.

■ Solution of material in moisture on the skin, or perspiration, may markedly increase skin corrosion and accelerate tissue destruction.

■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.

Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ The material can cause respiratory irritation in some persons.

The body's response to such irritation can cause further lung damage.

■ Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage.

There may be dizziness, headache, nausea and weakness.

■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

■ Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce serious damage to the health of the individual.

CHRONIC HEALTH EFFECTS

■ Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs.

Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

Sodium phosphate dibasic can cause stones in the kidney, loss of mineral from the bones and loss of thyroid gland function.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
pyrophosphoric acid	2466-09-3	>98
in hot water quickly converted to phosphoric acid	7664-38-2	

Section 4 - FIRST AID MEASURES

SWALLOWED

· For advice, contact a Poisons Information Center or a doctor at once. · Urgent hospital treatment is likely to be needed.

EYE

■ If this product comes in contact with the eyes: · Immediately hold eyelids apart and flush the eye continuously with running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN

■ If skin or hair contact occurs: · Immediately flush body and clothes with large amounts of water, using safety shower if available. · Quickly remove all contaminated clothing, including footwear.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested. Inhalation of vapors or aerosols (mists, fumes) may cause lung edema. Corrosive substances may cause lung damage (e.g.

NOTES TO PHYSICIAN

■ For acute or short term repeated exposures to strong acids:
· Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
· Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Negligible
Upper Explosive Limit (%):	Not applicable
Specific Gravity (water=1):	1.7
Lower Explosive Limit (%):	Not applicable

EXTINGUISHING MEDIA

· Water spray or fog.
· Foam.

FIRE FIGHTING

· Alert Emergency Responders and tell them location and nature of hazard.
· Wear full body protective clothing with breathing apparatus.
When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

· Non combustible.
· Not considered to be a significant fire risk.
Decomposition may produce toxic fumes of: phosphorus oxides (POx).

FIRE INCOMPATIBILITY

■ None known.

PERSONAL PROTECTION

Glasses:
Chemical goggles.
Full face- shield.
Gloves:
Respirator:
Type B-P Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

■ Environmental hazard - contain spillage.
· Remove all ignition sources.
· Clean up all spills immediately.
· Avoid contact with skin and eyes.

- Control personal contact by using protective equipment.
 - Use dry clean up procedures and avoid generating dust.
 - Place in a suitable, labelled container for waste disposal.
 - Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
 - Check regularly for spills and leaks.
- MAJOR SPILLS**
- Environmental hazard - contain spillage.
 - Clear area of personnel and move upwind.
 - Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

RECOMMENDED STORAGE METHODS

- DO NOT use aluminum or galvanized containers.
- Check regularly for spills and leaks.
- Glass container.
 - Lined metal can, Lined metal pail/drum
 - Plastic pail.
- For low viscosity materials
 - Drums and jerricans must be of the non-removable head type.
 - Where a can is to be used as an inner package, the can must have a screwed enclosure.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes
Canada - Ontario Occupational Exposure Limits	pyrophosphoric acid (Particles Insoluble or Poorly Soluble) Not Otherwise)		10 (I)						
Canada - British Columbia Occupational Exposure Limits	pyrophosphoric acid (Particles Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))		10 (N)						
Canada - Ontario Occupational Exposure Limits	pyrophosphoric acid (Specified (PNOS) / Particules (insolubles ou peu solubles) non précisées par ailleurs)		3 (R)						
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	pyrophosphoric acid (Particulates not otherwise regulated Respirable fraction)		5						

US - California Permissible Exposure Limits for Chemical Contaminants	pyrophosphoric acid (Particulates not otherwise regulated Respirable fraction)	5		(n)
US - Oregon Permissible Exposure Limits (Z-1)	pyrophosphoric acid (Particulates not otherwise regulated (PNOR) (f) Total Dust)	10		Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. PNOR means "particles not otherwise regulated."
US - Michigan Exposure Limits for Air Contaminants	pyrophosphoric acid (Particulates not otherwise regulated, Respirable dust)	5		Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. PNOR means "particles not otherwise regulated."
US - Oregon Permissible Exposure Limits (Z-1)	pyrophosphoric acid (Particulates not otherwise regulated (PNOR) (f) Respirable Fraction)	5		Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. PNOR means "particles not otherwise regulated."
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	pyrophosphoric acid (Particulates not otherwise regulated (PNOR)(f)-Respirable fraction)	5		
Canada - Prince Edward Island Occupational Exposure Limits	pyrophosphoric acid (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)	10		See Appendix B current TLV/BEI Book
Canada - Alberta Occupational Exposure Limits	phosphoric acid (Phosphoric acid)	1	3	
Canada - British Columbia Occupational Exposure Limits	phosphoric acid (Phosphoric acid)	1	3	

US - Minnesota Permissible Exposure Limits (PELs)	phosphoric acid (Phosphoric acid)	1	3	
US OSHA Permissible Exposure Levels (PELs) - Table Z1	phosphoric acid (Phosphoric acid)	1		
US ACGIH Threshold Limit Values (TLV)	phosphoric acid (Phosphoric acid)	1	3	TLV Basis: upper respiratory tract, eye & skin irritation
US NIOSH Recommended Exposure Limits (RELs)	phosphoric acid (Phosphoric acid)	1	3	
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	phosphoric acid (Phosphoric acid)	1	3	
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	phosphoric acid (Phosphoric acid)	1		
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	phosphoric acid (Phosphoric acid)	1	3	
US - California Permissible Exposure Limits for Chemical Contaminants	phosphoric acid (Phosphoric acid)	1	3	
US - Idaho - Limits for Air Contaminants	phosphoric acid (Phosphoric acid)	1		
US - Hawaii Air Contaminant Limits	phosphoric acid (Phosphoric acid)	1	3	
US - Alaska Limits for Air Contaminants	phosphoric acid (Phosphoric acid)	1	3	
US - Michigan Exposure Limits for Air Contaminants	phosphoric acid (Phosphoric acid)	1	3	
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	phosphoric acid (Phosphoric acid)	1	3	
US - Washington Permissible exposure limits of air contaminants	phosphoric acid (Phosphoric acid)	1	3	

Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	phosphoric acid (Phosphoric acid)	1	3	
Canada - Prince Edward Island Occupational Exposure Limits	phosphoric acid (Phosphoric acid)	1	3	TLV Basis: upper respiratory tract, eye & skin irritation
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	phosphoric acid (Phosphoric acid)	1		
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	phosphoric acid (Phosphoric acid)	1	3	
US - Oregon Permissible Exposure Limits (Z-1)	phosphoric acid (Phosphoric acid)	1		
Canada - Northwest Territories Occupational Exposure Limits (English)	phosphoric acid (Phosphoric acid)	1	3	
Canada - Nova Scotia Occupational Exposure Limits	phosphoric acid (Phosphoric acid)	1	3	TLV Basis: upper respiratory tract, eye & skin irritation

ENDOELTABLE

PERSONAL PROTECTION



RESPIRATOR

• Type B-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

EYE

- Chemical goggles.
- Full face shield.

HANDS/FEET

■ Elbow length PVC gloves.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.

· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.

· Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

OTHER

· Overalls.

· PVC Apron.

ENGINEERING CONTROLS

■ Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Mixes with water.

Corrosive.

Acid.

Toxic or noxious vapours/gas.

State	DIVIDED SOLID	Molecular Weight	177.99
Melting Range (°F)	142	Viscosity	Not Applicable
Boiling Range (°F)	Not applicable	Solubility in water (g/L)	Miscible
Flash Point (°F)	Not applicable	pH (1% solution)	Not available
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not applicable	Vapour Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	1.7
Lower Explosive Limit (%)	Not applicable	Relative Vapor Density (air=1)	Not Applicable
Volatile Component (%vol)	Negligible	Evaporation Rate	Not applicable

APPEARANCE

Hygroscopic glass-like solid; mixes with water changing to phosphoric acid. Soluble in alcohol, ether. Pyrophosphoric acid is a medium strong inorganic acid. The anion, the salts, and the esters of pyrophosphoric acid are called pyrophosphates.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

· Contact with alkaline material liberates heat.

· Presence of incompatible materials.

· Product is considered stable.

STORAGE INCOMPATIBILITY

■ Phosphoric acid:

· is a medium-strong acid which produces violent reaction with bases

· may produce violent react when water is added to the concentrated form

· reacts violently with solutions containing ammonia or bleach, azo compounds, epoxides and other polymerisable compounds

· reacts, possibly violently with amines, aldehydes, alkanolamines, alcohols, alkylene oxides, amides, ammonia, ammonia hydroxide, calcium oxide, cyanides, epichlorohydrin, esters, halogenated organics, isocyanates, ketones, oleum, organic anhydrides, sodium tetraborate, sulfides, sulfuric acid, strong oxidisers, vinyl acetate

· forms explosive mixtures with nitromethane

· at elevated temperatures attacks many metals producing hydrogen gas

· at room temperature does not attack stainless steel, copper or its alloys

· attacks glass, ceramics, and some plastics, rubber and coatings.

· Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pH's of less than 7.0.

· Inorganic acids neutralize chemical bases (for example: amines and inorganic hydroxides) to form salts.

· Reacts vigorously with alkalis.

Reacts with mild steel, galvanized steel / zinc producing hydrogen gas which may form an explosive mixture with air.

· Phosphates are incompatible with oxidizing and reducing agents.

· Phosphates are susceptible to formation of highly toxic and flammable phosphine gas in the presence of strong reducing agents such as hydrides.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

pyrophosphoric acid

TOXICITY AND IRRITATION

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.
- Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.
- The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration.
- The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

PYROPHOSPHORIC ACID:

TOXICITY	IRRITATION
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Oral (Mouse) LD50: 1170 mg/kg

- The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function. No significant acute toxicological data identified in literature search.

TOXICITY	IRRITATION
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PHOSPHORIC ACID:

Unreported (human) LDLo: 220 mg/kg

Skin
(rabbit):595 mg/24h - SEVERE

Oral (rat) LD50: 1530 mg/kg	Eye (rabbit): 119 mg - SEVERE
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Oral (rat) LD50: 3500 mg/kg*	[Monsanto]*
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Dermal (rabbit) LD50: 1260 mg/kg*

Inhalation (Rat) LC50: 25.5 mg/m³/4h

Inhalation (Mouse) LC50: 25.5 mg/m ³ /4h

phosphoric acid (85%)

CARCINOGEN

Acid mists, strong inorganic	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	1
phosphoric acid	US - Rhode Island Hazardous Substance List	IARC	

Section 12 - ECOLOGICAL INFORMATION

May cause long-term adverse effects in the aquatic environment.
 May cause long-term adverse effects in the environment.
 This material and its container must be disposed of as hazardous waste.

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

Corrosivity characteristic: use EPA hazardous waste number D002 (waste code C)

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Puncture containers to prevent re-use and bury at an authorized landfill.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

For small quantities:

- Neutralize an aqueous solution of the material.
- Filter solids for disposal to approved land fill.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

Section 14 - TRANSPORTATION INFORMATION

DOT:

Symbols: None Hazard class or Division: 8

Identification Numbers: UN3260 PG: II

Label Codes: 8 Special provisions: IB8, IP2,

IP4, T3,

TP33

Packaging: Exceptions: 154 Packaging: Non- bulk: 212

Packaging: Exceptions: 154 Quantity limitations: 15 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 50 kg Vessel stowage: Location: B

aircraft only:

Vessel stowage: Other: None

Hazardous materials descriptions and proper shipping names:

Corrosive solid, acidic, inorganic, n.o.s.

Air Transport IATA:

UN/ID Number: 3260 Packing Group: II

Special provisions: A3

Cargo Only

Packing Instructions: 863 Maximum Qty/Pack: 50 kg

Passenger and Cargo Passenger and Cargo

Packing Instructions: Y844 Maximum Qty/Pack: 15 kg

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: 859 Maximum Qty/Pack: 5 kg

Shipping Name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.

*(CONTAINS PYROPHOSPHORIC ACID)

Maritime Transport IMDG:

IMDG Class: 8 IMDG Subrisk: None

UN Number: 3260 Packing Group: II

EMS Number: F-A,S-B Special provisions: 274

Limited Quantities: 1 kg

Shipping Name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.(contains pyrophosphoric acid)

Section 15 - REGULATORY INFORMATION

pyrophosphoric acid (CAS: 2466-09-3) is found on the following regulatory lists;

"US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified"

Regulations for ingredients

phosphoric acid (CAS: 7664-38-2,16271-20-8) is found on the following regulatory lists;

"Canada - Alberta Occupational Exposure Limits","Canada - British Columbia Occupational Exposure Limits","Canada - Northwest Territories Occupational Exposure Limits (English)","Canada - Nova Scotia Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Saskatchewan Industrial Hazardous Substances","Canada - Saskatchewan Occupational Health and Safety Regulations -

Contamination Limits", "Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances", "Canada Domestic Substances List (DSL)", "Canada Ingredient Disclosure List (SOR/88-64)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Council of Chemical Associations (ICCA) - High Production Volume List", "US - Alaska Limits for Air Contaminants", "US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified", "US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List", "US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - California Toxic Air Contaminant List Category II", "US - Connecticut Hazardous Air Pollutants", "US - Hawaii Air Contaminant Limits", "US - Idaho - Limits for Air Contaminants", "US - Massachusetts Oil & Hazardous Material List", "US - Michigan Exposure Limits for Air Contaminants", "US - Minnesota Hazardous Substance List", "US - Minnesota Permissible Exposure Limits (PELs)", "US - New Jersey Right to Know Hazardous Substances", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substance List", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants", "US - Washington Permissible exposure limits of air contaminants", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US ACGIH Threshold Limit Values (TLV)", "US CWA (Clean Water Act) - List of Hazardous Substances", "US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances", "US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA High Production Volume Chemicals Additional List", "US FDA Direct Food Substances Generally Recognized as Safe", "US Food Additive Database", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US NIOSH Recommended Exposure Limits (RELs)", "US OSHA Permissible Exposure Levels (PELs) - Table Z1", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

- Skin contact may produce health damage*.
- Inhalation may produce serious health damage*.
- Cumulative effects may result following exposure*.

* (limited evidence).

Ingredients with multiple CAS Nos

Ingredient Name CAS phosphoric acid 7664-38-2, 16271-20-8

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- Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net/references.

- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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