




NFPA	HMIS	PPE	Transport Symbol						
	<table border="1"> <tr> <td>Health Hazard</td> <td>3*</td> </tr> <tr> <td>Fire Hazard</td> <td>2</td> </tr> <tr> <td>Reactivity</td> <td>1</td> </tr> </table>	Health Hazard	3*	Fire Hazard	2	Reactivity	1		
Health Hazard	3*								
Fire Hazard	2								
Reactivity	1								

*Indicates a chronic health hazard.

Issuing Date 05-Feb-2009

Revision Date

Revision Number 0

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name Cyclopentyl Chloroformate

UN-No UN2742

Recommended Use Intermediate.

Supplier Address

VanDeMark Chemical, Inc.
 1 North Transit Road
 Lockport, NY 14094
 Telephone: 716-433-6764

Company Emergency Phone Number 716-433-6764

Emergency Telephone Number Chemtrec: 1-800-424-9300 for US/ 703-527-3887 outside US

2. HAZARDS IDENTIFICATION

WARNING!

Emergency Overview

Harmful by inhalation
 May cause pulmonary edema
 Pulmonary edema can be fatal
 Harmful if swallowed
 May be harmful if absorbed through skin
 Irritant
 May produce an allergic reaction
 May cause sensitization by skin contact
 Vapors may be irritating to eyes, nose, throat, and lungs

Appearance Colorless

Physical State Liquid.

Odor Acrid

OSHA Regulatory Status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential Health Effects
Principle Routes of Exposure

Inhalation, Skin contact, Eye contact.

Acute Toxicity

Eyes
Skin

Severely irritating to eyes. May cause burns.
 May be harmful in contact with skin. May cause skin irritation and/or dermatitis. May cause sensitization by skin contact.

Inhalation

Harmful by inhalation. Irritating to respiratory system. Contact with moist mucous membranes of the respiratory system can cause caustic condition resulting in burns. Inhalation of vapors in high concentration may cause shortness of breath (lung edema). Pulmonary edema can be fatal.

Ingestion

Harmful if swallowed. Ingestion causes burns of the upper digestive and respiratory tract. Aspiration may cause pulmonary edema and pneumonitis. May cause additional affects as listed under "Inhalation".

Chronic Effects

Avoid repeated exposure. Prolonged exposure may cause chronic effects. May produce an allergic reaction. Repeated inhalation of vapors may cause irritation of respiratory tract or bronchitis.

Aggravated Medical Conditions

Allergies, Skin disorders, Respiratory disorders.

Environmental Hazard

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. See Section 12 for additional Ecological Information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula C6H9ClO2

Chemical Name	CAS-No	Weight %
Cyclopentyl chloroformate	50715-28-1	>=95

4. FIRST AID MEASURES

General Advice	Immediate medical attention is required. Show this safety data sheet to the doctor in attendance. If symptoms persist, call a physician.
Eye Contact	Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Call a physician immediately.
Skin Contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. If skin irritation persists, call a physician.
Inhalation	Call a physician or Poison Control Center immediately. Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.
Ingestion	Call a physician or Poison Control Center immediately. Remove from exposure, lie down. Clean mouth with water and afterwards drink plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting.
Notes to Physician	May cause sensitization of susceptible persons. Use of epinephrine may be indicated. Treat symptomatically.
Protection of First-aiders	Use personal protective equipment. Avoid contact with skin, eyes and clothing. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Remove all sources of ignition.

5. FIRE-FIGHTING MEASURES

Flammable Properties	Flammable; may be ignited by heat, sparks or flames.
Flash Point	42.5°C
Suitable Extinguishing Media	Carbon dioxide (CO ₂). Dry powder. Dry chemical. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable Extinguishing Media	Water.
Hazardous Combustion Products	Cyclopentyl alcohol, Hydrogen chloride, Chlorine gas, Carbon oxides.
Explosion Data	
Sensitivity to Mechanical Impact	None
Sensitivity to Static Discharge	Yes.
Specific Hazards Arising from the Chemical	Emits toxic gases/vapors under fire conditions and in contact with water. Thermal decomposition can lead to release of toxic and corrosive gases/vapors. In the event of fire and/or explosion do not breathe fumes. May cause sensitization by inhalation and skin contact.
Protective Equipment and Precautions for Firefighters	As in any fire, wear self-contained breathing apparatus and full protective gear.

NFPA	Health Hazard 3	Flammability 2	Stability 1	Physical and Chemical Hazards W
HMIS	Health Hazard 3*	Flammability 2	Physical Hazard 1	Personal Protection -

*Indicates a chronic health hazard.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Evacuate personnel to safe areas. Remove all sources of ignition. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.
Environmental Precautions	Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.
Methods for Containment	Dike for later disposal; do not apply water unless directed to do so. Prevent further leakage or spillage if safe to do so.
Methods for Cleaning Up	Use personal protective equipment. Dam up. Neutralize with soda ash (sodium carbonate) or lime over area of spill. Cover liquid spill with sand, earth or other noncombustible absorbent material. Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water. Do not direct water at spill or source of leak. Use non-sparking tools and equipment.

7. HANDLING AND STORAGE

Handling	Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation. Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Prevent breathing of mist or vapors. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. Use only in an area containing flame proof equipment. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Use only in area provided with appropriate exhaust ventilation.
Storage	Keep at <-5 °C. Keep container tightly closed in a dry and well-ventilated place. Keep in properly labeled containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines	This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.
Engineering Measures	Showers Eyewash stations Ventilation systems
Personal Protective Equipment	
Eye/Face Protection	Tightly fitting safety goggles. Face-shield.
Skin and Body Protection	Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Impervious butyl rubber gloves.
Respiratory Protection	Wear a positive-pressure supplied-air respirator with full facepiece.
Hygiene Measures	Wear suitable gloves and eye/face protection. Prevent contact with skin eyes and clothing. Remove and wash contaminated clothing before re-use. Contaminated work clothing should not be allowed out of the workplace. Provide regular cleaning of equipment, work area and clothing. Keep away from food, drink and animal feeding stuffs. When using, do not eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless.	Odor	Acrid.
Odor Threshold	No information available	Physical State	Liquid
pH	No information available		
Flash Point	42.5°C	Autoignition Temperature	-398°C
Decomposition Temperature	No information available	Boiling Point/Range	102.5°C
Melting Point/Range	<-60°C		
Flammability Limits in Air	No information available	Explosion Limits	No information available
Molecular Weight	148.59	Water Solubility	Decomposes
Solubility	No information available	Evaporation Rate	No information available
Vapor Pressure	204 Pa (20°C) 85100 Pa (100°C)	Vapor Density	No data available
Density	1.1507 g/cm ³ @ 20 degreesC	VOC Content	Not applicable

10. STABILITY AND REACTIVITY

Stability	Stable up to approximately -5°C. Reacts with water.
Incompatible Products	Water. Alkaline. Alkaline earth metals. Amines. Alcohols. Acids. Bases. Iron.
Conditions to Avoid	Exposure to water. Exposure to air or moisture over prolonged periods. Extremes of temperature and direct sunlight. Temperatures above -5°C.
Hazardous Decomposition Products	Keep refrigerated. Emits toxic gases/vapors under fire conditions and in contact with water. Thermal decomposition can lead to release of toxic/corrosive gases and vapors. Hydrogen chloride. Cyclopentyl alcohol.
Hazardous Polymerization	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information

Inhalation

There is no data available for this product. Harmful by inhalation. Contact with moist mucous membranes of the respiratory system can cause caustic condition resulting in burns. Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhalation of vapors in high concentration may cause shortness of breath (lung edema). Pulmonary edema can be fatal.

Eye Contact

Severely irritating to eyes. May cause burns.

Skin Contact

May be harmful in contact with skin. May cause irritation. May cause sensitization by skin contact.

Ingestion

Harmful if swallowed. Ingestion causes burns of the upper digestive and respiratory tract. Aspiration may cause pulmonary edema and pneumonitis.

Chronic Toxicity

Chronic Toxicity

Avoid repeated exposure. Prolonged exposure may cause chronic effects. May produce an allergic reaction. Repeated inhalation of vapors may cause irritation of respiratory tract or bronchitis.

Carcinogenicity

There are no known carcinogenic chemicals in this product.

Sensitization

May cause sensitization by skin contact. Shown to be strong sensitizer in animal (Guinea-pig) studies.

Target Organ Effects

Lungs, Eyes.

12. ECOLOGICAL INFORMATION

Ecotoxicity

The environmental impact of this product has not been fully investigated.

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Cyclopentyl chloroformate		Brachydanio rerio: CL50 (24 hrs) = 26.3 mg/l CL50 (48 hrs) = 26.3 mg/l CL50 (72hrs) 26.3mg/l CL50 (96 hrs) = 26.3mg/l		CE50 (24 hrs) = 16.2 mg/l CE50 (48 hrs) = 12.6 mg/l

Persistence and Degradability

Decomposes by hydrolyse to form hydrochloric acid, carbon dioxide and cyclopentyl alcohol. No data is available on the product itself.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods

Should not be released into the environment.

Contaminated Packaging

Dispose of in accordance with local regulations

14. TRANSPORT INFORMATION

DOT

Proper Shipping Name Chloroformates, toxic, corrosive, flammable, n.o.s.
Hazard Class 6.1
Subsidiary Class 8, 3
UN-No UN2742
Packing Group II
Description UN2742,Chloroformates, toxic, corrosive, flammable, n.o.s.,6.1,(8, 3),,PG II
Emergency Response Guide Number 155

TDG

Proper Shipping Name Chloroformates, toxic, corrosive, flammable, n.o.s.
Hazard Class 6.1
Subsidiary Class 8, 3
UN-No UN2742
Packing Group II
Description CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.,6.1,UN2742,PG II

MEX

Proper Shipping Name Chloroformates, toxic, corrosive, flammable, n.o.s.
Hazard Class 6.1
Subsidiary Class 3, 8
UN-No UN2742
Packing Group II
Description UN2742 Chloroformates, toxic, corrosive, flammable, n.o.s.,6.1,II

ICAO

UN-No UN2742
Proper Shipping Name Chloroformates, toxic, corrosive, flammable, n.o.s.
Hazard Class 6.1
Subsidiary Class 3, 8
Packing Group II
Description Chloroformates, toxic, corrosive, flammable, n.o.s.,6.1(3, 8),UN2742,PG II

IATA

UN-No UN2742
Proper Shipping Name Chloroformates, toxic, corrosive, flammable, n.o.s.
Hazard Class 6.1
Subsidiary Class 3, 8
Packing Group II
ERG Code 6CF
Description UN2742,Chloroformates, toxic, corrosive, flammable, n.o.s.,6.1(3, 8),PG II

IMDG/IMO

Proper Shipping Name Chloroformates, toxic, corrosive, flammable, n.o.s.
Hazard Class 6.1
Subsidiary Class 3, 8, +
UN-No UN2742
Packing Group II
EmS No. F-E, S-C
Description UN2742, Chloroformates, toxic, corrosive, flammable, n.o.s.,6.1(3, 8, +),PG II

RID

Proper Shipping Name Chloroformates, toxic, corrosive, flammable, n.o.s.

14. TRANSPORT INFORMATION

Hazard Class 6.1
UN-No UN2742
Packing Group II
Classification Code TFC
Description UN2742 Chloroformates, toxic, corrosive, flammable, n.o.s.,6.1,II,RID
ADR/RID-Labels 6.1 + 3 + 8

ADR

Proper Shipping Name Chloroformates, toxic, corrosive, flammable, n.o.s.
Hazard Class 6.1
UN-No UN2742
Packing Group II
Classification Code TFC
Description UN2742 Chloroformates, toxic, corrosive, flammable, n.o.s.,6.1,II
ADR/RID-Labels 8, 3

ADN

Proper Shipping Name Chloroformates, toxic, corrosive, flammable, n.o.s.
Hazard Class 6.1
Packing Group II
Classification Code TFC
Special Provisions 274, 561, 802
Description UN2742 Chloroformates, toxic, corrosive, flammable, n.o.s.,6.1,II
Hazard Labels 6.1 + 3 + 8
Limited Quantity LQ17
Ventilation VE01, VE02

15. REGULATORY INFORMATION

International Inventories

TSCA	This product contains ingredients which are not listed on the TSCA Inventory. It is for research and development purposes only.
DSL	Does not comply
NDSL	Does not comply
EINECS	Complies
ENCS	Does not comply
IECSC	Does not comply
KECL	Does not comply
PICCS	Does not comply
AICS	Does not comply

Legend

- TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory
- EINECS/ELINCS** - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
- DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List
- PICCS** - Philippines Inventory of Chemicals and Chemical Substances
- ENCS** - Japan Existing and New Chemical Substances
- IECSC** - China Inventory of Existing Chemical Substances
- AICS** - Australian Inventory of Chemical Substances
- KECL** - Korean Existing and Evaluated Chemical Substances

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	Yes
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

U.S. State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

International Regulations

Mexico - Grade Moderate risk, Grade 2

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class

- B3 Combustible liquid
- D2B Toxic materials



16. OTHER INFORMATION

Prepared By	Product Stewardship 23 British American Blvd. Latham, NY 12110 1-800-572-6501
Issuing Date	05-Feb-2009
Revision Date	
Revision Note	No information available

Disclaimer

The information provided on this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of Safety Data Sheet