

1. Identification

Product identifier	Pentyl Chloroformate
Other means of identification	
Synonyms	Amyl Chloroformate; Carbonochloridic Acid; Pentyl Ester
Recommended use	Intermediate.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Manufacturer	VanDeMark Chemical Inc.
Address	1 North Transit Road, Lockport, NY 14094 USA
Telephone	716-433-6764
e-mail	sales@vdmchemical.com
Emergency telephone	CHEMTREC 1-800-424-9300 (North America) +1-703-527-3887 (International)

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 3
Health hazards	Acute toxicity, inhalation	Category 2
	Skin corrosion/irritation	Category 1B
OSHA defined hazards	Not classified.	
Label elements		



Signal word	Danger
Hazard statement	Flammable liquid and vapor. Causes severe skin burns and eye damage. Fatal if inhaled.
Precautionary statement	
Prevention	Keep away from flames and hot surfaces. No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe mist/vapors/spray. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area.
Response	If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center/doctor.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.

3. Composition/information on ingredients**Substances**

Chemical name	Common name and synonyms	CAS number	%
Pentyl chloroformate	Amyl Chloroformate; Carbonochloridic Acid; Pentyl Ester	638-41-5	>99

Composition comments	All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
4. First-aid measures	
Inhalation	Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device.
Skin contact	Immediately remove contaminated clothing. Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately. Chemical burns must be treated by a physician.
Eye contact	Immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses and open eyelids wide apart. Get medical attention immediately. Continue to rinse.
Ingestion	Immediately rinse mouth and drink plenty of water. Keep victim under observation. Do not induce vomiting. Get medical attention immediately.
Most important symptoms/effects, acute and delayed	Eye contact: Extreme irritation of eyes and mucous membranes, including burning and tearing. Skin contact: Burning pain and severe corrosive skin damage. Inhalation: Aspiration may cause pulmonary edema and pneumonitis. Cough, shortness of breath, headache, nausea, vomiting. Ingestion: Can burn mouth, throat, and stomach.
Indication of immediate medical attention and special treatment needed	Be aware that symptoms of chemical pneumonia (shortness of breath) may occur several hours after exposure.
General information	Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.
5. Fire-fighting measures	
Suitable extinguishing media	Extinguish with alcohol-resistant foam, carbon dioxide or dry powder.
Unsuitable extinguishing media	Water.
Specific hazards arising from the chemical	By heating and fire, toxic and corrosive vapors/gases may be formed. Vapors may form explosive mixtures with air.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing should be worn when fighting chemical fires. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures.
6. Accidental release measures	
Personal precautions, protective equipment and emergency procedures	Evacuate area. Eliminate all sources of ignition. Keep upwind. Avoid inhalation of vapors and spray mists. Avoid contact with skin and eyes. Wear suitable protective clothing.
Methods and materials for containment and cleaning up	Remove sources of ignition. Absorb spillage with non-combustible, absorbent material. Collect in approved containers and seal securely. Containers must be labeled. Following product recovery, flush area with water. Prevent product from entering drains. For waste disposal, see Section 13 of the SDS.
Environmental precautions	Do not discharge into drains, water courses or onto the ground.
7. Handling and storage	
Precautions for safe handling	All handling to take place in well-ventilated area. Avoid inhalation of vapors and spray mist and contact with skin and eyes. Avoid contact with clothing. Wear appropriate personal protective equipment. The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. Use explosion-proof ventilation equipment. Wash hands after handling. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store in a cool, dry, well-ventilated place. Keep away from heat, sparks and open flame. Keep container tightly closed. Keep under nitrogen. Protect from moisture. Store away from incompatible materials.
8. Exposure controls/personal protection	
Occupational exposure limits	No exposure limits noted for ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls	Should be handled in closed systems, if possible. Provide adequate ventilation. Local ventilation should be provided. Provide easy access to water supply or an emergency shower.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Wear tight-fitting goggles or face shield.
Skin protection	
Hand protection	Wear protective gloves. Be aware that the liquid may penetrate the gloves. Frequent change is advisable. In full contact: Glove material: Viton. Layer thickness: 0.7 mm. Breakthrough time: >480 min. Suitable gloves can be recommended by the glove supplier.
Other	Wear appropriate clothing to prevent repeated or prolonged skin contact. Apron and long sleeves are recommended.
Respiratory protection	Use a NIOSH/MSHA approved air purifying respirator as needed to control exposure. Consult with respirator manufacturer to determine respirator selection, use, and limitations. Use positive pressure, air-supplied respirator for uncontrolled releases or when air purifying respirator limitations may be exceeded. Follow respirator protection program requirements (OSHA 1910.134 and ANSI Z88.2) for all respirator use. Wear suitable respiratory protection. Chemical respirator with organic vapor cartridge.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	Colorless to pale yellow liquid.
Physical state	Liquid.
Form	Liquid.
Color	Colorless to Pale Yellow.
Odor	Pungent.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	140 - 143.6 °F (60 - 62 °C) (15 mbar)
Flash point	128.3 °F (53.5 °C)
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Vapor pressure	3 mbar (25 °C)
Vapor density	Not available.
Relative density	1.032 (20 °C)
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	No data available.
Auto-ignition temperature	509 °F (265 °C)
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive limit	Not available.
Explosive properties	Not explosive.
Molecular formula	C6H11ClO2
Oxidizing properties	Not oxidizing.

VOC (Weight %) 100 %

10. Stability and reactivity

Reactivity The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability Decomposes in the presence of water.

Possibility of hazardous reactions Hazardous polymerization does not occur.

Conditions to avoid Protect against direct sunlight. Heat, flames and sparks. Extreme temperatures. Moisture. Air.

Incompatible materials Water. Strong oxidizing agents. Bases. Alcohols. Amines.

Hazardous decomposition products Carbon oxides. Hydrogen chloride. Halogenated compounds.

11. Toxicological information

Information on likely routes of exposure

Inhalation Can cause severe respiratory irritation. Inhalation of vapor or mist may cause lung edema. Be aware that symptoms of chemical pneumonia (shortness of breath) may occur several hours after exposure.

Skin contact Causes skin burns.

Eye contact Causes serious eye damage.

Ingestion May cause burns in mucous membranes, throat, esophagus and stomach.

Symptoms related to the physical, chemical and toxicological characteristics Eye contact: Extreme irritation of eyes and mucous membranes, including burning and tearing. Skin contact: Burning pain and severe corrosive skin damage. Inhalation: Aspiration may cause pulmonary edema and pneumonitis. Cough, shortness of breath, headache, nausea, vomiting. Ingestion: Can burn mouth, throat, and stomach.

Information on toxicological effects

Acute toxicity Fatal if inhaled.

Skin corrosion/irritation Causes severe skin burns.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization No data available.

Skin sensitization No data available.

Germ cell mutagenicity No data available.

Carcinogenicity No data available.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Reproductive toxicity No data available.

Specific target organ toxicity - single exposure No data available.

Specific target organ toxicity - repeated exposure No data available.

Aspiration hazard No data available.

Chronic effects Prolonged exposure may cause chronic effects. Erosion of exposed teeth.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability No data available.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Mobility in general No data available.

Other adverse effects None known.

13. Disposal considerations

Disposal instructions	Dispose in accordance with applicable federal, state, and local regulations.
Hazardous waste code	D001: Waste Flammable material with a flash point <140 °F D002: Corrosive waste
Waste from residues / unused products	Dispose of in accordance with local regulations. Avoid discharge into water courses or onto the ground.
Contaminated packaging	Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT	
UN number	UN2742
UN proper shipping name	Chloroformates, toxic, corrosive, flammable, n.o.s. (Pentyl chloroformate)
Transport hazard class(es)	
Class	6.1(PGI, II)
Subsidiary risk	8, 3
Label(s)	6.1, 8, 3
Packing group	II
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	5, IB1, T7, TP2
Packaging exceptions	153
Packaging non bulk	202
Packaging bulk	243
IATA	
UN number	UN2742
UN proper shipping name	Chloroformates, toxic, corrosive, flammable, n.o.s. (Pentyl chloroformate)
Transport hazard class(es)	
Class	6.1
Subsidiary risk	3, 8
Label(s)	6.1 + 3 + 8
Packing group	II
Environmental hazards	No
ERG Code	6CF
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling. Read safety instructions, SDS and emergency procedures before handling.
IMDG	
UN number	UN2742
UN proper shipping name	CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (Pentyl chloroformate)
Transport hazard class(es)	
Class	6.1
Subsidiary risk	3, 8
Label(s)	6.1 + 3 + 8
Packing group	II
Environmental hazards	
Marine pollutant	No
EmS	F-E, S-C
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling. Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not relevant.

15. Regulatory information

US federal regulations	This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)	Not regulated.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)	Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
 Delayed Hazard - No
 Fire Hazard - Yes
 Pressure Hazard - No
 Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)
 Not regulated.

Other federal regulations**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations**US. Massachusetts RTK - Substance List**

Not regulated.

US. New Jersey Worker and Community Right-to-Know Act

Not listed.

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

Not Listed.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	Yes
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

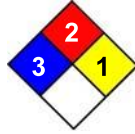
Issue date 18-July-2014
Revision date 17-July-2015
Version # 02

Further information

HMIS® is a registered trade and service mark of the NPCA.
HMIS personal protection: C - Safety Glasses, Gloves, Apron.

HMIS® ratings

NFPA Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
Health: 3
Flammability: 2
Physical hazard: 1
Personal protection: C

NFPA ratings**List of abbreviations**

LD50: Lethal Dose, 50%.
LC50: Lethal Concentration, 50%.

References

C&L Inventory database.

Disclaimer

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.