

SAFETY DATA SHEET

1. Identification

Product identifier	Phosgene
Other means of identification	
CAS number	75-44-5
Recommended use	Chemical intermediate.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Company name	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	Gases under pressure	Compressed gas
Health hazards	Acute toxicity, inhalation	Category 1
	Skin corrosion/irritation	Category 1B
	Serious eye damage/eye irritation	Category 1
OSHA defined hazards	Not classified.	
Label elements		



Signal word	Danger
Hazard statement	Contains gas under pressure; may explode if heated. Fatal if inhaled. Causes severe skin burns and eye damage.
Precautionary statement	
Prevention	Do not breathe gas. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection.
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. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse.
Storage	Keep container tightly closed. Store locked up. Protect from sunlight. Store in a well-ventilated place.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Phosgene		75-44-5	100

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 protect from further exposure through decontamination and removal of victim to fresh air. Keep victim at rest in a position comfortable for breathing. Oxygen or artificial respiration only if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or poison control center immediately.

Skin contact Immediately remove contaminated clothing and shoes and wash skin with soap and plenty of water.

In case of cold burns (frostbite) treat symptomatically.

Eye contact Immediately flush with plenty of water. Remove any contact lenses and open eyelids wide apart taking care to rinse under the eyelids. Call an ambulance and continue flushing during transportation to hospital taking along these instructions.

Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").

Ingestion Not likely, due to the form of the product. Remove victim immediately from source of exposure. Rinse mouth and drink plenty of water. Do not induce vomiting. Get medical attention.

Most important symptoms/effects, acute and delayed Burning pain and severe corrosive skin damage. Nausea, vomiting. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Coughing. Contact with liquefied gas may cause frostbite. Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Chemical 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. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Ensure medical personnel are familiar with reference materials available on the American Chemistry Counsel's Phosgene Panel web page for medical treatment options:
<https://www.americanchemistry.com/ProductsTechnology/Phosgene/PDF-Phosgene-Information-on-Options-for-First-Aid-and-Medical-Treatment.pdf>

5. Fire-fighting measures

Suitable extinguishing media Water spray, fog or regular foam.

Unsuitable extinguishing media None known.

Specific hazards arising from the chemical In case of fire, toxic and corrosive gases may be formed. Combustion products may include: carbon oxides, chlorine, carbon tetrachloride. Slowly reacts with water to form hydrochloric acid and carbon dioxide.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire fighting equipment/instructions In case of fire: Stop leak if safe to do so. Move containers from fire area if you can do so without risk. Do not direct water at source of leak or safety devices; icing may occur. Water spray on leaking cylinder may help cool containers and reduce gaseous emissions.

Specific methods Remove pressurized gas cylinders from the immediate vicinity. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.

General fire hazards Contents under pressure. Pressurized container may explode when exposed to heat or flame.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Wear appropriate protective equipment and clothing during clean-up. Do not breathe gas. Emergency personnel need self-contained breathing equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up Stop the flow of material, if this is without risk. If possible, turn leaking containers so that gas escapes rather than liquid. Do not direct water at spill or source of leak. Ventilate the contaminated area. Isolate area until gas has dispersed. For waste disposal, see section 13 of the SDS.

Environmental precautions Prevent entry into waterways, sewer, basements or confined areas.

7. Handling and storage

Precautions for safe handling

Do not breathe gas. Do not get in eyes, on skin, or on clothing. Avoid prolonged exposure. Provide adequate ventilation. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Use care in handling/storage.

Conditions for safe storage, including any incompatibilities

Store locked up. Store in a cool, dry place out of direct sunlight. Secure cylinders in proper position at all times, close all valves when not in use. Stored containers should be periodically checked for general condition and leakage. Store in original tightly closed container. Store in a well-ventilated place. Keep at temperatures below 55 °C / 130 °F. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Material	Type	Value
Phosgene (CAS 75-44-5)	PEL	0.4 mg/m ³
		0.1 ppm

US. ACGIH Threshold Limit Values

Material	Type	Value
Phosgene (CAS 75-44-5)	TWA	0.1 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Material	Type	Value
Phosgene (CAS 75-44-5)	Ceiling	0.8 mg/m ³
		0.2 ppm
	TWA	0.4 mg/m ³
		0.1 ppm

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station and safety shower.

Individual protection measures, such as personal protective equipment

Eye/face protection

Safety eye wear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection

Nitrile or neoprene will provide protection from gas or vapors. Hand protection should be considered to protect against cryogenic burns if the possibility of contact with liquid phosgene exists.

Notice: The selection of a specific glove for an application and duration of use in a workplace should also take in to account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection) potential body reactions to the glove material as well as instructions/specifications provided by the glove manufacturer.

Other

Selection of specific items such as boots, apron, or full body suit will depend on task and potential for exposure. Polyethylene coatings of 10 mils provide a barrier for splash protection. Safety shower should be located in the immediate work area. Remove contaminated clothing immediately, wash skin area with soap and water. Contaminated clothing poses a significant risk of secondary exposure. Avoid inhalation of vapors that may be present on contaminated articles of personal protective equipment. Dispose of clothing and PPE properly.

Respiratory protection

Respiratory protections should be worn when there is a potential to exceed the exposure limit requirements or guidelines. In case of inadequate ventilation, use suitable respiratory equipment with gas filter for organic gas. If respirators are used, a program should be instituted to assure compliance with OSHA 29 CFR 1910.134. In higher concentrations or in case of insufficient data on concentration wear a positive-pressure supplied-air respirator.

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. Private clothes and working clothes should be kept separately.

9. Physical and chemical properties**Appearance**

Physical state	Gas.
Form	Compressed liquefied gas.
Color	Clear.

Odor	Grass.
Odor threshold	0.4 - 1.5 ppm (EPA IRIS 2006)

pH	Not applicable.
Melting point/freezing point	-198.4 °F (-128 °C)

Initial boiling point and boiling range	46.8 °F (8.2 °C)
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Flash point	Non flammable.
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Evaporation rate	Not applicable.
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Flammability (solid, gas)	Non flammable.
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Upper/lower flammability or explosive limits

Flammability limit - lower (%)	Not applicable.
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Flammability limit - upper (%)	Not applicable.
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Explosive limit - lower (%)	Not applicable.
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Explosive limit - upper (%)	Not applicable.
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Vapor pressure	23.44 psia (20 °C)
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Vapor density	3.4 (Air=1)
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Relative density	1.388
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Relative density temperature	68 °F (20 °C)
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Solubility(ies)

Solubility (water)	Hydrolyzes.
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Partition coefficient (n-octanol/water)	-0.71
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Auto-ignition temperature	Not applicable.
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Decomposition temperature	482 °F (250 °C)
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Viscosity	0.4 cps
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Other information

Molecular formula	C-Cl ₂ -O
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Molecular weight	98.92 g/mol
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Percent volatile	100 %
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Surface tension	15.9 mN/m (114.98 °F (46.1 °C))
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VOC	100 % EPA
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10. Stability and reactivity

Reactivity	Slowly reacts with water to form hydrochloric acid and carbon dioxide.
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Chemical stability	Material is stable under normal conditions.
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Possibility of hazardous reactions	Phosgene may react violently with aluminum, isopropyl alcohol, alkali metals.
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Conditions to avoid	Heat. Avoid temperatures exceeding the decomposition temperature. Contact with incompatible materials.
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Incompatible materials	Ammonia. Alcohols. Amines. Sodium/sodium oxides. Potassium. Water, moisture.
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Hazardous decomposition products	This material begins to decompose in air at around 250°C (482°F).
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11. Toxicological information

Information on likely routes of exposure

Inhalation	Fatal if inhaled. Causes severe respiratory tract irritation.
Skin contact	Causes severe skin burns. Contact with evaporating liquid may cause frostbite or freezing of skin.
Eye contact	Causes serious eye damage.
Ingestion	This material is a gas under normal atmospheric conditions and ingestion is unlikely. If the liquid is swallowed, frostbite damage to the lips, mouth and mucous membranes may occur.

Symptoms related to the physical, chemical and toxicological characteristics

Burning pain and severe corrosive skin damage. Nausea, vomiting. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Coughing. Contact with liquefied gas may cause frostbite. Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure.

Information on toxicological effects

Acute toxicity Fatal if inhaled.

Product	Species	Test Results
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Phosgene (CAS 75-44-5)

Acute

Inhalation

LC50

Rat

0.084 mg/l, 30 minutes

Skin corrosion/irritation

Causes chemical burns. Causes frostbite skin burns with direct liquid contact.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization

Not a respiratory sensitizer.

Skin sensitization

This product is not expected to cause skin sensitization.

Germ cell mutagenicity

No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity

Not classifiable as to carcinogenicity to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

NTP Report on Carcinogens

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Reproductive toxicity

This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure

No data available.

Specific target organ toxicity - repeated exposure

No data available.

Aspiration hazard

Not likely, due to the form of the product.

Chronic effects

Prolonged inhalation may be harmful. May cause lung edema.

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 is available on the degradability of this product.

Bioaccumulative potential

The product is not bioaccumulating.

Partition coefficient n-octanol / water (log Kow)

-0.71

Mobility in soil

Phosgene is expected to have very high mobility based upon its partition coefficient. Phosgene may volatilize rapidly from dry soil surfaces based upon its vapor pressure. Phosgene may volatilize rapidly from moist soil surfaces based upon its Henry's Law constant.

Other adverse effects

This product contains one or more substances identified as hazardous air pollutants (HAPs) per the US Federal Clean Air Act (see section 15). Very persistent in the atmosphere. Estimated troposphere half-life is about 14 days.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

US RCRA Hazardous Waste P List: Reference

Phosgene (CAS 75-44-5)

P095

Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN1076
UN proper shipping name	Phosgene
Transport hazard class(es)	
Class	2.3
Subsidiary risk	8
Label(s)	2.3, 8
Packing group	Not applicable.
Environmental hazards	
Marine pollutant	No
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	1, B7, B46
Packaging exceptions	None
Packaging non bulk	192
Packaging bulk	314

IATA

UN number	UN1076
UN proper shipping name	Phosgene
Transport hazard class(es)	
Class	2.3
Subsidiary risk	8
Packing group	Not applicable.
Environmental hazards	No
ERG Code	2CP
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN1076
UN proper shipping name	PHOSGENE
Transport hazard class(es)	
Class	2.3
Subsidiary risk	8
Packing group	Not applicable.
Environmental hazards	
Marine pollutant	No
EmS	F-C, S-U
Special precautions for user	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 applicable. This product is a compressed or liquefied gas and when transported in bulk is covered under IGC code.

General information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: Ensure that containers are firmly secured. Ensure cylinder valve is closed and not leaking. Ensure valve outlet cap nut or plug (where provided) is correctly fitted. Ensure valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations.

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.

CERCLA Hazardous Substance List (40 CFR 302.4)

Phosgene (CAS 75-44-5) Listed.

SARA 304 Emergency release notification

Carbonic dichloride (CAS 75-44-5) 10 LBS

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Toxic Substances Control Act (TSCA)**Superfund Amendments and Reauthorization Act of 1986 (SARA)****SARA 302 Extremely hazardous substance**

Chemical name	CAS number	Reportable quantity (pounds)	Threshold planning quantity (pounds)	Threshold planning quantity, lower value (pounds)	Threshold planning quantity, upper value (pounds)
Phosgene	75-44-5	10	10		

SARA 311/312 Hazardous chemical

Classified hazard categories Yes
 Gas under pressure
 Acute toxicity (any route of exposure)
 Skin corrosion or irritation
 Serious eye damage or eye irritation

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Phosgene	75-44-5	100

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

Phosgene (CAS 75-44-5)

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

Phosgene (CAS 75-44-5)

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130) Hazardous substance

Safe Drinking Water Act (SDWA) Not regulated.

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

Phosgene (CAS 75-44-5)

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

Phosgene (CAS 75-44-5)

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

Phosgene (CAS 75-44-5)

US. Rhode Island RTK

Phosgene (CAS 75-44-5)

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

Phosgene (CAS 75-44-5)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
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 10-December-2014

Revision date 20-June-2019

Version # 02

HMIS® ratings Health: 4
Flammability: 0
Physical hazard: 1

NFPA ratings



List of abbreviations

References

ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
American Chemistry Council Phosgene Panel – Phosgene Safe Practices Guidelines:

<https://www.americanchemistry.com/Phosgene-Safe-Practice-Guidelines/>

American Chemistry Council Phosgene Panel – Phosgene: Information on Options for First Aid and Medical Treatment:

"<https://www.americanchemistry.com/ProductsTechnology/Phosgene/PDF-Phosgene-Information-on-Options-for-First-Aid-and-Medical-Treatment.pdf>"

HSDB® - Hazardous Substances Data Bank

IARC Monographs. Overall Evaluation of Carcinogenicity

National Toxicology Program (NTP) Report on Carcinogens

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