


## 1. Identification

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

## 2. Hazard(s) identification

<b>Physical hazards</b>	Gases under pressure	Compressed gas
<b>Health hazards</b>	Acute toxicity, inhalation	Category 1
	Skin corrosion/irritation	Category 1B
	Serious eye damage/eye irritation	Category 1
<b>OSHA defined hazards</b>	Not classified.	
<b>Label elements</b>		

<b>Signal word</b>	Danger
<b>Hazard statement</b>	Contains gas under pressure; may explode if heated. Fatal if inhaled. Causes severe skin burns and eye damage.
<b>Precautionary statement</b>	
<b>Prevention</b>	Do not breathe gas. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection. Use only outdoors or in a well-ventilated area.
<b>Response</b>	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.
<b>Storage</b>	Store locked up. Protect from sunlight. Store in a well-ventilated place. Keep container tightly closed.
<b>Disposal</b>	Dispose of contents/container in accordance with local/regional/national/international regulations.
<b>Hazard(s) not otherwise classified (HNOC)</b>	None known.

## 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

<b>Inhalation</b>	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.
<b>Skin contact</b>	Immediately remove contaminated clothing and shoes and wash skin with soap and plenty of water. In case of cold burns (frostbite) treat symptomatically.
<b>Eye contact</b>	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").
<b>Ingestion</b>	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.
<b>Most important symptoms/effects, acute and delayed</b>	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.
<b>Indication of immediate medical attention and special treatment needed</b>	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.
<b>General information</b>	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: <a href="http://www.americanchemistry.com/ProductsTechnology/Phosgene/PDF-Phosgene-Information-on-Options-for-First-Aid-and-Medical-Treatment.pdf">http://www.americanchemistry.com/ProductsTechnology/Phosgene/PDF-Phosgene-Information-on-Options-for-First-Aid-and-Medical-Treatment.pdf</a>

## 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
<b>Unsuitable extinguishing media</b>	Water spray on leaking cylinder may help cool containers and reduce gaseous emissions. Water combined with corrosive gases from a leak may increase the size of leak due to corrosion over time.
<b>Specific hazards arising from the chemical</b>	In case of fire, toxic and corrosive gases may be formed.
<b>Special protective equipment and precautions for firefighters</b>	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.
<b>Fire fighting equipment/instructions</b>	In case of fire: Stop leak if safe to do so. Move containers from fire area if you can do so without risk.
<b>Specific methods</b>	Remove pressurized gas cylinders from the immediate vicinity.
<b>General fire hazards</b>	Contents under pressure. Pressurized container may explode when exposed to heat or flame. Note, cylinder will likely develop leaks around valves and fittings instead of over pressurizing catastrophically.

## 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	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.
<b>Methods and materials for containment and cleaning up</b>	Stop the flow of material, if this is without risk. Isolate area until gas has dispersed. Ventilate the contaminated area. For waste disposal, see section 13 of the SDS.
<b>Environmental precautions</b>	Attempt to stop the gas leak, if no risk is involved.

## 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. 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 <sup>3</sup> 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 <sup>3</sup>
		0.2 ppm
	TWA	0.4 mg/m <sup>3</sup> 0.1 ppm

### Biological limit values

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

### Appropriate engineering controls

Provide adequate ventilation.

### Individual protection measures, such as personal protective equipment

#### Eye/face protection

Use of full-faced respiratory protection is recommended.

#### Skin protection

##### Hand protection

Laminate gloves are recommended.

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.

<b>Color</b>	Clear.
<b>Odor</b>	Grass.
<b>Odor threshold</b>	0.4 - 1.5 ppm (EPA IRIS 2006)
<b>pH</b>	Not applicable.
<b>Melting point/freezing point</b>	-198.4 °F (-128 °C)
<b>Initial boiling point and boiling range</b>	46.76 °F (8.2 °C)
<b>Flash point</b>	Non flammable.
<b>Evaporation rate</b>	Not applicable.
<b>Flammability (solid, gas)</b>	Non flammable.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	Not applicable.
<b>Flammability limit - upper (%)</b>	Not applicable.
<b>Explosive limit - lower (%)</b>	Not applicable.
<b>Explosive limit - upper (%)</b>	Not applicable.
<b>Vapor pressure</b>	23.44 psia (20 °C)
<b>Vapor density</b>	3.4 (Air=1)
<b>Relative density</b>	1.388
<b>Relative density temperature</b>	68 °F (20 °C)
<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	Hydrolyzes.
<b>Partition coefficient (n-octanol/water)</b>	-0.71
<b>Auto-ignition temperature</b>	Not applicable.
<b>Decomposition temperature</b>	482 °F (250 °C)
<b>Viscosity</b>	0.4 cps
<b>Other information</b>	
<b>Molecular formula</b>	C-Cl <sub>2</sub> -O
<b>Molecular weight</b>	98.92 g/mol
<b>Percent volatile</b>	100 %
<b>VOC (Weight %)</b>	100 % EPA

## 10. Stability and reactivity

<b>Reactivity</b>	The product is stable and non-reactive under normal conditions of use, storage and transport.
<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	No dangerous reaction known under conditions of normal use.
<b>Conditions to avoid</b>	Heat. Avoid temperatures exceeding the decomposition temperature. Slowly reacts with water to form hydrochloric acid and carbon dioxide. Contact with incompatible materials.
<b>Incompatible materials</b>	Ammonia. Alcohols. Amines. Sodium/sodium oxides. Potassium.
<b>Hazardous decomposition products</b>	Carbon dioxide. Hydrochloric acid. This material begins to decompose in air at around 250°C (482°F).

## 11. Toxicological information

### Information on likely routes of exposure

<b>Inhalation</b>	Fatal if inhaled. Causes severe respiratory tract irritation.
<b>Skin contact</b>	Causes frostbite skin burns with direct liquid contact.
<b>Eye contact</b>	Causes serious eye damage.
<b>Ingestion</b>	Not expected to be a significant route of exposure.

**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
Phosgene (CAS 75-44-5)		
<b>Acute</b>		
<i>Inhalation</i>		
LC50	Rat	0.084 mg/l, 30 minutes
<b>Skin corrosion/irritation</b>	Causes frostbite skin burns with direct liquid contact.	
<b>Serious eye damage/eye irritation</b>	Causes serious eye damage.	
<b>Respiratory or skin sensitization</b>		
<b>Respiratory sensitization</b>	Not a respiratory sensitizer.	
<b>Skin sensitization</b>	This product is not expected to cause skin sensitization.	
<b>Germ cell mutagenicity</b>	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.	
<b>Carcinogenicity</b>	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.	
<b>OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)</b>		
Not listed.		
<b>Reproductive toxicity</b>	This product is not expected to cause reproductive or developmental effects.	
<b>Specific target organ toxicity - single exposure</b>	No data available.	
<b>Specific target organ toxicity - repeated exposure</b>	No data available.	
<b>Aspiration hazard</b>	Not likely, due to the form of the product.	
<b>Chronic effects</b>	Prolonged inhalation may be harmful. May cause lung edema.	

**12. Ecological information**

<b>Ecotoxicity</b>	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.
<b>Persistence and degradability</b>	No data is available on the degradability of this product.
<b>Bioaccumulative potential</b>	The product is not bioaccumulating.
<b>Partition coefficient n-octanol / water (log Kow)</b>	
-0.71	
<b>Mobility in soil</b>	While phosgene adsorbs strongly to relatively dry soil, it is likely to rapidly volatilize and hydrolyze when released on moist soils. Very persistent in the atmosphere. Estimated troposphere half-life is about 14 days.
<b>Other adverse effects</b>	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

**13. Disposal considerations**

<b>Disposal instructions</b>	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.
<b>Local disposal regulations</b>	Dispose in accordance with all applicable regulations.
<b>Hazardous waste code</b>	D002: Corrosive waste 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.  
**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.

## 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)**

Phosgene (CAS 75-44-5) LISTED

### **Superfund Amendments and Reauthorization Act of 1986 (SARA)**

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

**SARA 302 Extremely hazardous substance**

Chemical name	CAS number	Reportable quantity	Threshold planning quantity	Threshold planning quantity, lower value	Threshold planning quantity, upper value
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Phosgene	75-44-5	10	10 lbs		
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**SARA 311/312 Hazardous chemical** Yes

**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)

**US. 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.

**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**

<b>Issue date</b>	10-December-2014
<b>Revision date</b>	-
<b>Version #</b>	01
<b>Further information</b>	HMIS® is a registered trade and service mark of the NPCA.
<b>HMIS® ratings</b>	Health: 4 Flammability: 0 Physical hazard: 1

**NFPA ratings****List of abbreviations**

**References**

US. IARC Monographs on Occupational Exposures to Chemical Agents  
HSDB® - Hazardous Substances Data Bank  
IARC Monographs. Overall Evaluation of Carcinogenicity  
National Toxicology Program (NTP) Report on Carcinogens  
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices  
American Chemistry Counsel Phosgene Panel – Phosgene Safe Practices Guidelines -  
<http://www.americanchemistry.com/ProductsTechnology/Phosgene/Phosgene-Safe-Practice-Guidelines-Manual/default.aspx>. American Chemistry Counsel Phosgene Panel – Phosgene:  
Information on Options for First Aid and Medical Treatment -  
<http://www.americanchemistry.com/ProductsTechnology/Phosgene/PDF-Phosgene-Information-on-Options-for-First-Aid-and-Medical-Treatment.pdf>.

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