

Oxalyl chloride

sc-215640

Material Safety Data Sheet



The Power to Question

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

Oxalyl chloride

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

Company: Santa Cruz Biotechnology, Inc.

2145 Delaware Ave
Santa Cruz, CA 95060

Telephone: 800.457.3801 or 831.457.3800

Emergency Tel: **CHEMWATCH: From within the US and Canada:**
877-715-9305

Emergency Tel: **From outside the US and Canada: +800 2436 2255**
(1-800-CHEMCALL) or call +613 9573 3112

PRODUCT USE

Military poison gas; chlorinating agent in organic synthesis.

SYNONYMS

C₂-Cl₂-O₂, (COCl₂)₂, "ethanedioyl dichloride", "ethanedioyl chloride"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max	
Flammability:	1			
Toxicity:	3			
Body Contact:	4			
Reactivity:	2			
Chronic:	2			
				Min/Nil=0 Low=1 Moderate=2 High=3 Extreme=4



CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Reacts violently with water.

Causes severe burns.

Risk of serious damage to eyes.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

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

■ Accidental ingestion of the material may be seriously damaging to the health of the individual; animal experiments indicate that ingestion of less than 40 gram may be fatal.

■ Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and esophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. Swelling of the epiglottis may make it difficult to breathe which may result in suffocation. More severe exposure may result in vomiting blood and thick mucus, shock, abnormally low blood pressure, fluctuating pulse, shallow respiration and clammy skin, inflammation of stomach wall, and rupture of esophageal tissue. Untreated shock may eventually result in kidney failure. Severe cases may result in perforation of the stomach and abdominal cavity with consequent infection, rigidity and fever. There may be severe narrowing of the esophageal or pyloric sphincters; this may occur immediately or after a delay of weeks to years. There may be coma and convulsions, followed by death due to infection of the abdominal cavity, kidneys or lungs.

EYE

■ The material can produce severe 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. Severe burns produce long-lasting and possibly irreversible damage. The appearance of the burn may not be apparent for several weeks after the initial contact. The cornea may ultimately become deeply opaque resulting in blindness.

■ Irritation of the eyes may produce a heavy secretion of tears (lachrymation).

SKIN

■ The material can produce severe 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 is not thought to have harmful health effects, however the material may still produce health damage following entry through wounds, lesions or abrasions.

■ 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

■ 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.

■ 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. Swelling of the lungs can occur, either immediately or after a delay; symptoms of this include chest tightness, shortness of breath, frothy phlegm and cyanosis. Lack of oxygen can cause death hours after onset.

■ Inhalation of quantities of liquid mist may be extremely hazardous, even lethal due to spasm, extreme irritation of larynx and bronchi, chemical pneumonitis and pulmonary edema.

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. Chronic exposure may inflame the skin or conjunctiva.

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

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
oxalyl chloride	79-37-8	>98
reacts with moisture to produce		
hydrogen chloride	7647-01-0	
may contain		
phosgene	75-44-5	

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.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

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.
- Continue flushing until advised to stop by the Poisons Information Center or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

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.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Center.
- Transport to hospital, or doctor.

INHALED



- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

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.
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterized by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

INGESTION:

- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralize the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:

- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralizing agents or any other additives. Several liters of saline are required.
- Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

[Ellenhorn and Barceloux: Medical Toxicology].

Section 5 - FIRE FIGHTING MEASURES

Vapor Pressure (mmHg):	149.637 @ 20 C
Upper Explosive Limit (%):	Not available.
Specific Gravity (water=1):	1.488 (13 deg C)
Lower Explosive Limit (%):	Not available.

EXTINGUISHING MEDIA



- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

FIRE FIGHTING



- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS



- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
- Heating may cause expansion or decomposition leading to violent rupture of rigid containers.
- May emit acrid smoke and corrosive fumes.

Combustion products include: carbon monoxide (CO), carbon dioxide (CO₂), hydrogen chloride, phosgene, other pyrolysis products typical of burning organic material.

FIRE INCOMPATIBILITY

■ Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION

Glasses:

Safety Glasses.

Full face- shield.

Gloves:

Respirator:

Type BAX-P Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS



- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

MAJOR SPILLS

■ Chemical Class: acidic compounds, organic

For release onto land: recommended sorbents listed in order of priority.

SORBENT TYPE	RANK	APPLICATION	COLLECTION	LIMITATIONS
LAND SPILL - SMALL				
wood fiber - pillow	1	throw	pitchfork	R, P, DGC, RT
cross-linked polymer - particulate	1	shovel	shovel	R, W, SS
cross-linked polymer - pillow	1	throw	pitchfork	R, DGC, RT
sorbent clay - particulate	2	shovel	shovel	R, I, P
foamed glass - pillow	2	throw	pitchfork	R, P, DGC, RT
wood fiber - particulate	3	shovel	shovel	R, W, P, DGC
LAND SPILL - MEDIUM				
cross-linked polymer - particulate	1	blower	skiploader	R, W, SS
polypropylene - particulate	2	blower	skiploader	W, SS, DGC
sorbent clay - particulate	2	blower	skiploader	R, I, P
cross-linked polymer - pillow	3	throw	skiploader	R, DGC, RT
polypropylene - mat	3	throw	skiploader	W, SS, DGC

expanded mineral -
particulate

3

blower

skiploader

R, I, W, P, DGC

Legend

DGC: Not effective where ground cover is dense

R; Not reusable

I: Not incinerable

P: Effectiveness reduced when rainy

RT: Not effective where terrain is rugged

SS: Not for use within environmentally sensitive sites

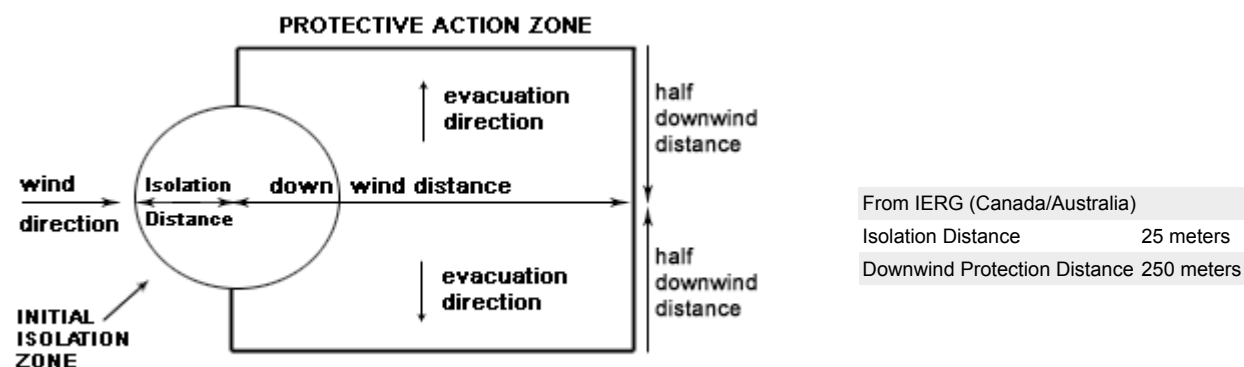
W: Effectiveness reduced when windy

Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control;

R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988.

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL



From US Emergency Response Guide 2000 Guide 154

FOOTNOTES

1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.

2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.

3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.

4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills". LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.

5 Guide 154 is taken from the US DOT emergency response guide book.

6 IERG information is derived from CANUTEC - Transport Canada.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

hydrogen					
chloride					
AEGL Type	10 min	30 min	60 min	4 hr	8 hr
1	1.8	1.8	1.8	1.8	GALSYN~
2	100	43	22	11	GALSYN~
3	620	210	100	26	GALSYN~
phosgene					

AEGL Type	10 min	30 min	60 min	4 hr	8 hr
1	NR	NR	NR	NR	GALSYN~
3	7.8	2.6	1.3	0.33	GALSYN~

NOTES

NR = Not recommended due to insufficient data

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- DO NOT allow clothing wet with material to stay in contact with skin
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

RECOMMENDED STORAGE METHODS

- DO NOT use aluminum or galvanized containers.
- Lined metal can, Lined metal pail/drum
- Plastic pail
- Polyliner drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



X: Must not be stored together

O: May be stored together with specific preventions

+: May be stored together

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 - British Columbia Occupational Exposure Limits	hydrogen chloride (Hydrogen chloride Revised 2003)					2			
Canada - Ontario Occupational Exposure Limits	hydrogen chloride (Hydrogen chloride)					2			
US - Minnesota Permissible Exposure Limits (PELs)	hydrogen chloride (Hydrogen chloride)					5	7		
US ACGIH Threshold Limit Values (TLV)	hydrogen chloride (Hydrogen chloride)					2			TLV Basis: upper respiratory tract irritation
US NIOSH Recommended Exposure Limits (RELs)	hydrogen chloride (Hydrogen chloride)					5	7		
Canada - Alberta Occupational Exposure Limits	hydrogen chloride (Hydrogen chloride)					2	3		
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	hydrogen chloride (Hydrogen chloride)					5	7		
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	hydrogen chloride (Hydrogen chloride)	(C)5	(C)7						
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	hydrogen chloride (Hydrogen chloride)					5	7		
US - California Permissible Exposure Limits for Chemical Contaminants	hydrogen chloride (Hydrogen chloride; muriatic acid)					5	7		
US - Idaho - Limits for Air Contaminants	hydrogen chloride (Hydrogen chloride)					5	7		
US - Hawaii Air Contaminant Limits	hydrogen chloride (Hydrogen chloride)					5	7		
US - Alaska Limits for Air Contaminants	hydrogen chloride (Hydrogen chloride)					5	7		
US - Michigan Exposure Limits for Air Contaminants	hydrogen chloride (Hydrogen chloride)					5	7		
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	hydrogen chloride (Hydrogen chloride)	5	7	-	-				
US - Washington Permissible exposure limits of air contaminants	hydrogen chloride (Hydrogen chloride)					5.0			
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	hydrogen chloride (Hydrogen chloride)					2			
US - Oregon Permissible Exposure Limits (Z-1)	hydrogen chloride (Hydrogen chloride)					5	7		
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	hydrogen chloride (Hydrogen chloride)					5	7		
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	hydrogen chloride (Hydrogen chloride)					5	7,5		
US OSHA Permissible Exposure Levels (PELs) - Table Z1	hydrogen chloride (Hydrogen chloride)					5	7		

Canada - Northwest Territories Occupational Exposure Limits (English)	hydrogen chloride (Hydrogen chloride)			5	7.5	
Canada - Nova Scotia Occupational Exposure Limits	hydrogen chloride (Hydrogen chloride)			2		TLV Basis: upper respiratory tract irritation
Canada - Prince Edward Island Occupational Exposure Limits	hydrogen chloride (Hydrogen chloride)			2		TLV Basis: upper respiratory tract irritation
Canada - Alberta Occupational Exposure Limits	phosgene (Carbonyl chloride (Phosgene))	0.1	0.4			
Canada - British Columbia Occupational Exposure Limits	phosgene (Phosgene)	0.1				
Canada - Ontario Occupational Exposure Limits	phosgene (Carbonyl chloride)	0.1	0.4			
US OSHA Permissible Exposure Levels (PELs) - Table Z1	phosgene (Phosgene (Carbonyl chloride))	0.1	0.4			
US ACGIH Threshold Limit Values (TLV)	phosgene (Phosgene)	0.1				TLV Basis: upper respiratory tract irritation; pulmonary edema & emphysema
US NIOSH Recommended Exposure Limits (RELs)	phosgene (Phosgene)	0.1	0.4	0.2	0.8	(Ceiling ([15-minute]))
US - Minnesota Permissible Exposure Limits (PELs)	phosgene (Phosgene (Carbonyl chloride))	0.1	0.4			
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	phosgene (Phosgene (Carbonyl chloride))	0.1	0.4			
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	phosgene (Phosgene (Carbonyl chloride))	0.1	0.4			
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	phosgene (Phosgene (Carbonyl chloride))	0.1	0.4			
US - California Permissible Exposure Limits for Chemical Contaminants	phosgene (Phosgene; carbonyl chloride; COCl ₂)	0.1	0.4			
US - Idaho - Limits for Air Contaminants	phosgene (Phosgene (carbonyl chloride))	0.1	0.4			
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	phosgene (Phosgene)	0.1	0.4			
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	phosgene (Phosgene (Carbonyl chloride))	0.1		0.3		
US - Hawaii Air Contaminant Limits	phosgene (Phosgene (Carbonyl chloride))	0.1	0.4			
US - Alaska Limits for Air Contaminants	phosgene (Phosgene (Carbonyl chloride))	0.1	0.4			
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	phosgene (Carbonyl chloride (phosgene))	0.05	0.2	-	-	
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	phosgene (Phosgene (carbonyl chloride))	0.1	0.4	0.3	1.2	

US - Washington Permissible exposure limits of air contaminants	phosgene (Phosgene (carbonyl chloride))	0.1	0.3		
US - Michigan Exposure Limits for Air Contaminants	phosgene (Phosgene (Carbonyl chloride))	0.1	0.4		
Canada - Nova Scotia Occupational Exposure Limits	phosgene (Phosgene)	0.1			TLV Basis: upper respiratory tract irritation; pulmonary edema & emphysema
Canada - Prince Edward Island Occupational Exposure Limits	phosgene (Phosgene)	0.1			TLV Basis: upper respiratory tract irritation; pulmonary edema & emphysema
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	phosgene (Phosgene (Carbonyl chloride))	0.1	0.4		
US - Oregon Permissible Exposure Limits (Z-1)	phosgene (Phosgene (carbonyl chloride))	0.1	0.4		
Canada - Northwest Territories Occupational Exposure Limits (English)	phosgene (Phosgene (Carbonyl chloride))	0.1	0.4	0.3	1.2
Canada - Northwest Territories Occupational Exposure Limits (English)	phosgene (Carbonyl chloride (Phosgene))	0.1	0.4	0.3	1.2

The following materials had no OELs on our records

- oxalyl chloride: CAS:79-37-8

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
hydrogen chloride		50
phosgene		2 [Unch]

ODOR SAFETY FACTOR (OSF)

OSF=0.022 (PHOSGENE)

■ Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odor Safety Factor (OSF) is determined to fall into either Class C, D or E.

The Odor Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odor Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV-TWA for example) is being reached, even when distracted by working activities
B	26-550	Idem for 50-90% of persons being distracted
C	1-26	Idem for less than 50% of persons being distracted
D	0.18-1	0-50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	Idem for less than 10% of persons aware of being tested

Amoore and Hautala * have determined that it is only at an OSF value of 26 that 50% of distracted persons can detect the substance at the Exposure Standard value. In the case of alerted persons, an OSF of 26 means that 99% of them can detect the odor at the Exposure Standard value. It is ONLY for substances belonging to Class A and B that there is a reasonable chance of being warned in time, that the Exposure Standard is being exceeded. * Journal Applied Toxicology: Vol 3, 1983, p272

NOTE: The use of the OSF may be inappropriate for mixtures where substances mask the odor of others.

MATERIAL DATA

OXALYL CHLORIDE:

■ None assigned. Refer to individual constituents.

HYDROGEN CHLORIDE:

■ for hydrogen chloride:

Odour Threshold Value: 0.262 ppm (detection), 10.06 ppm (recognition)

NOTE: Detector tubes for hydrochloric acid, measuring in excess of 1 ppm, are available commercially.

Hydrogen chloride is a strong irritant to the eyes, mucous membranes and skin. Chronic exposure produces a corrosive action on the teeth. Reports of respiratory irritation following short-term exposure at 5 ppm have lead to the recommended TLV-C. There is no indication that skin contact with hydrogen chloride elicits systemic poisoning and a skin designation has not been applied.

Exposure of humans to hydrogen chloride at 50 to 100 ppm for 1 hour is reported to be barely tolerable; 35 ppm caused irritation of the throat on short exposure and 10 ppm was the maximal concentration for prolonged exposure. It has been stated that hydrogen chloride at concentrations of 5 ppm is immediately irritating.

Odour Safety Factor(OSF)
OSF=1.3 (HYDROGEN CHLORIDE).
PHOSGENE:

■ For phosgene:

Odour Threshold: 0.9 ppm

At 1.2 ppm, 39% of subjects detect a "musty hay" or "green corn odour". None could detect it at 0.4 ppm.

Develops a pungent, irritating odour at 2 ppm.

Response	Concentration (ppm)
Maximum amount for prolonged exposure	1
Dangerous to life, for prolonged exposure	1.25-2.5
Cough or other subjective symptoms within 1 min	5
Irritation of eyes and respiratory tract in < 1 min	10
Dangerous to life in 30 to 60 min	12.5
Severe lung injury within 1 to 2 min	20
Dangerous to life for as little as 30 min	25
Rapidly fatal (30 min or less)	90

[Patty's]

NOTE: Detector tubes for phosgene, measuring in excess of 0.04 ppm, are commercially available.

The recommended exposure value (TLV) recognises the potential for pulmonary irritation after exposure to concentrations of phosgene slightly greater to 0.1 ppm but to which tolerance may develop. It is noted that subsequent exposures can induce tolerance against pulmonary irritation from concentrations permitted under the excursion limits criteria.

Odour Safety Factor (OSF)

OSF=0.022 (PHOSGENE).

PERSONAL PROTECTION



Consult your EHS staff for recommendations

EYE

- Chemical goggles.
- Full face shield.
- Contact lenses pose a special hazard; soft contact lenses may absorb irritants and all lenses concentrate them.

HANDS/FEET

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

- 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).

- 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) 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) 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.

Elbow length PVC gloves.

- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

RESPIRATOR

■ Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
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(volume)			
1000	10	BAX-1 P	-
1000	50	-	BAX-1 P
5000	50	Airline*	-
5000	100	-	BAX-2 P
10000	100	-	BAX-3 P
	100+		Airline* *

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

■ Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection an approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapors, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favorable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Corrosive.

Acid.

Toxic or noxious vapors/ gas.

Reacts violently with water.

State	LIQUID	Molecular Weight	126.93
Melting Range (°F)	10.4	Viscosity	Not Available
Boiling Range (°F)	145.4- 147.2	Solubility in water (g/L)	React violently
Flash Point (°F)	None	pH (1% solution)	Not available
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available.	Vapor Pressure (mmHg)	149.637 @ 20 C
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	1.488 (13 deg C)
Lower Explosive Limit (%)	Not available.	Relative Vapor Density (air=1)	4.4
Volatile Component (%vol)	Not available	Evaporation Rate	Not available

APPEARANCE

Colourless, fuming liquid with penetrating odour; decomposes violently in water and alcohol. acyl halide

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY



- Contact with alkaline material liberates heat
- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

■ Acyl halides tend to react violently with protic organic solvents, water, and the aprotic solvents, dimethylformamide and dimethyl sulfoxide. Their facile reaction with ethers is also potentially dangerous. In the absence of diluent or other effective control of reaction rate, sulfoxides may react violently or explosively with certain acyl halides. These violent reactions may be explained in terms of exothermic polymerization of formaldehyde which is formed under a variety of conditions by interaction of the sulfoxide with reactive halides. BRETHERICK L.: Handbook of Reactive Chemical Hazards.

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

- Avoid strong bases.

Segregate from alcohol, water.

Segregate from alkalis, oxidizing agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.

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

Section 11 - TOXICOLOGICAL INFORMATION

oxalyl chloride

TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
----------	------------

Inhalation (rat) LC50: 1840 ppm/1h

■ The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause 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.

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.

CARCINOGEN

Hydrochloric acid	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3
Hydrogen chloride	ND	Carcinogen Category	A4

SKIN

phosgene	ND	Notes	Skin
phosgene	Canada - Alberta Occupational Exposure Limits - Skin	Substance Interaction	1

Section 12 - ECOLOGICAL INFORMATION

Refer to data for ingredients, which follows:

HYDROGEN CHLORIDE:

PHOSGENE:

OXALYL CHLORIDE:

■ DO NOT discharge into sewer or waterways.

OXALYL CHLORIDE:

■ Prevent, by any means available, spillage from entering drains or watercourses.

HYDROGEN CHLORIDE:

■ Although inorganic chloride ions are not normally considered toxic they can exist in effluents at acutely toxic levels (chloride >3000 mg/l). the resulting salinity can exceed the tolerances of most freshwater organisms.

Inorganic chlorine eventually finds its way into the aqueous compartment and as such is bioavailable. Incidental exposure to inorganic chloride may occur in occupational settings where chemicals management policies are improperly applied. The toxicity of chloride salts depends on the counter-ion (cation) present; that of chloride itself is unknown. Chloride toxicity has not been observed in humans except in the special case of impaired sodium chloride metabolism, e.g. in congestive heart failure . Healthy individuals can tolerate the intake of large quantities of chloride provided that there is a concomitant intake of fresh water.

Although excessive intake of drinking-water containing sodium chloride at concentrations

above 2.5 g/litre has been reported to produce hypertension, this effect is believed to be related to the sodium ion concentration.

Chloride concentrations in excess of about 250 mg/litre can give rise to detectable taste in water, but the threshold depends upon the associated cations. Consumers can, however, become accustomed to concentrations in excess of 250 mg/litre. No health-based guideline value is proposed for chloride in drinking-water.

In humans, 88% of chloride is extracellular and contributes to the osmotic activity of body fluids. The electrolyte balance in the body is maintained by adjusting total dietary intake and by excretion via the kidneys and gastrointestinal tract. Chloride is almost completely absorbed in normal individuals, mostly from the proximal half of the small intestine. Normal fluid loss amounts to about 1.5?2 liters/day, together with about 4 g of chloride per day. Most (90 - 95%) is excreted in the urine, with minor amounts in faeces (4- %) and sweat (2%)

Chloride increases the electrical conductivity of water and thus increases its corrosivity. In metal pipes, chloride reacts with metal ions to form soluble salts thus increasing levels of metals in drinking-water. In lead pipes, a protective oxide layer is built up, but chloride enhances galvanic corrosion. It can also increase the rate of pitting corrosion of metal pipes.

PHOSGENE:

■ Hazardous Air Pollutant:	Yes
■ Half- life Soil - High (hours):	1
■ Half- life Soil - Low (hours):	0.05
■ Half- life Air - High (hours):	7.20E+14
■ Half- life Air - Low (hours):	989880
■ Half- life Surface water - High (hours):	1
■ Half- life Surface water - Low (hours):	0.05
■ Half- life Ground water - High (hours):	1
■ Half- life Ground water - Low (hours):	0.05
■ Aqueous biodegradation - Aerobic - High (hours):	672
■ Aqueous biodegradation - Aerobic - Low (hours):	168
■ Aqueous biodegradation - Anaerobic - High (hours):	2688
■ Aqueous biodegradation - Anaerobic - Low (hours):	672
■ Photolysis maximum light absorption - High (nano- m):	274.5
■ Photolysis maximum light absorption - Low (nano- m):	234.2
■ First order hydrolysis half- life (hours):	1.9
■ Hydrolysis in Air - High (hours):	7.20E+14
■ Hydrolysis in Air - Low (hours):	989880

■ For phosgene:

Environmental fate:

At normal ambient temperatures, the major pathway for phosgene degradation in air is gas-phase hydrolysis. However, even at high levels of humidity, phosgene in air is only slowly degraded and is likely to be persistent in the atmosphere and subject to long-range transport. In water, phosgene is rapidly degraded to hydrochloric acid and carbon dioxide. Detectable levels of phosgene in soil and vegetation are unlikely due to heterogeneous abiotic degradation.

Ecotoxicity:

Fish LC50 (24 h): 60 mg/l

No information has been reported on the effects of phosgene on the environment. However, the levels of phosgene now found in the general environment would not be expected to result in significant effects to aquatic or terrestrial biota. Damage to plants and aquatic organisms could occur in areas where accidental release of phosgene has occurred, owing to the rapid release of hydrochloric acid.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
oxalyl chloride	HIGH		LOW	HIGH
hydrogen chloride	LOW		LOW	HIGH
phosgene	LOW	LOW	LOW	HIGH

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

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

B. Component Waste Numbers

When phosgene is present as a solid waste as a discarded commercial chemical product, off-specification species, as a container residue, or a spill residue, use EPA waste number P095 (waste code T).

Disposal Instructions

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

- 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.
- Treat and neutralize at an approved treatment plant. Treatment should involve: Neutralization with soda-ash or soda-lime followed by: Burial in a licensed land-fill or Incineration in a licensed apparatus
- Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION



DOT:

Symbols:	None	Hazard class or Division:	8
Identification Numbers:	UN2922	PG:	II
Label Codes:	8, 6.1	Special provisions:	B3, IB2, T7, TP2
Packaging: Exceptions:	154	Packaging: Non-bulk:	202
Packaging: Exceptions:	154	Quantity limitations: Passenger aircraft/rail:	1 L
Quantity Limitations: Cargo aircraft only:	30 L	Vessel stowage: Location:	B
Vessel stowage: Other:	40		

Hazardous materials descriptions and proper shipping names:

Corrosive liquids, toxic, n.o.s.

Air Transport IATA:

ICAO/IATA Class:	8	ICAO/IATA Subrisk:	6.1
UN/ID Number:	2922	Packing Group:	II
Special provisions:	A3		

Shipping Name: CORROSIVE LIQUID, TOXIC, N.O.S. *(CONTAINS OXALYL CHLORIDE)

Maritime Transport IMDG:

IMDG Class:	8	IMDG Subrisk:	6.1
UN Number:	2922	Packing Group:	II
EMS Number:	F-A, S-B	Special provisions:	274
Limited Quantities:	1 L		

Shipping Name: CORROSIVE LIQUID, TOXIC, N.O.S.(contains oxalyl chloride)

Section 15 - REGULATORY INFORMATION



REGULATIONS

ND

Ingredient	CAS	% de minimus concentration
hydrogen chloride	7647-01-0	1.0
phosgene	75-44-5	1.0

ND

Ingredient	CAS	RQ
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hydrogen chloride	7647-01-0	5000 lb (2270 kg)
phosgene	75-44-5	10 lb (4.54 kg)

oxalyl chloride (CAS: 79-37-8) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)","US DOE Temporary Emergency Exposure Limits (TEELs)","US Toxic Substances Control Act (TSCA) - Inventory"

Regulations for ingredients

hydrogen chloride (CAS: 7647-01-0) is found on the following regulatory lists;

"Canada - Alberta Ambient Air Quality Objectives","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 - Ontario Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits - Carcinogens","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 Controlled Drugs and Substances Act Schedule VI","Canada Domestic Substances List (DSL)","Canada Ingredient Disclosure List (SOR/88-64)","Canada National Pollutant Release Inventory (NPRI)","Canada Prohibited Toxic Substances, Schedule 2, Concentration Limits (English)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (French)","CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP","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 Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","International Council of Chemical Associations (ICCA) - High Production Volume List","International Maritime Dangerous Goods Requirements (IMDG Code) - Goods Forbidden for Transport","OECD Representative List of High Production Volume (HPV) Chemicals","United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances - Table II","United Nations List of Precursors and Chemicals Frequently used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances Under International Control - Table II","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 - Acute Reference Exposure Levels and Target Organs (RELs)","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 Hazardous Materials","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 List of Highly Hazardous Chemicals, Toxics and Reactives","US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants","US ACGIH Threshold Limit Values (TLV)","US ACGIH Threshold Limit Values (TLV) - Carcinogens","US Clean Air Act - Hazardous Air Pollutants","US CWA (Clean Water Act) - List of Hazardous Substances","US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances","US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest","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 Drug Enforcement Administration (DEA) List I and II Regulated Chemicals","US EPA Acute Exposure Guideline Levels (AEGLs) - Final","US EPA High Production Volume Chemicals Additional List","US EPA Master Testing List - Index I Chemicals Listed","US EPCRA Section 313 Chemical List","US Food Additive Database","US List of Lists - Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act","US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases","US NIOSH Recommended Exposure Limits (RELs)","US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives","US OSHA Permissible Exposure Levels (PELs) - Table Z1","US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide","US SARA Section 302 Extremely Hazardous Substances","US Spacecraft Maximum Allowable Concentrations (SMACs) for Airborne Contaminants","US Toxic Substances Control Act (TSCA) - Inventory"

phosgene (CAS: 75-44-5) is found on the following regulatory lists;

"Canada - Alberta Ambient Air Quality Objectives","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 - Ontario Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits","Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances","Canada Chemical Weapons Schedule 3 (English)","Canada Domestic Substances List (DSL)","Canada Ingredient Disclosure List (SOR/88-64)","Canada National Pollutant Release Inventory (NPRI)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (French)","Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (English)","International Council of Chemical Associations (ICCA) - High Production Volume List","OECD Representative List of High Production Volume (HPV) Chemicals","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 - Acute Reference Exposure Levels and Target Organs (RELs)","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 Hazardous Materials","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 Hazardous Constituents","US - Vermont Hazardous Waste - Acutely Hazardous Wastes","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 Dangerous waste constituents list", "US - Washington Discarded Chemical Products List - ""P"" Chemical Products", "US - Washington Permissible exposure limits of air contaminants", "US - Wyoming List of Highly Hazardous Chemicals, Toxics and Reactives", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US ACGIH Threshold Limit Values (TLV)", "US CAA (Clean Air Act) - HON Rule - Organic HAPs (Hazardous Air Pollutants)", "US Clean Air Act - Hazardous Air Pollutants", "US CWA (Clean Water Act) - List of Hazardous Substances", "US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances", "US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest", "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 Acute Exposure Guideline Levels (AEGs) - Final", "US EPA High Production Volume Program Chemical List", "US EPCRA Section 313 Chemical List", "US List of Lists - Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act", "US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases", "US NIOSH Recommended Exposure Limits (RELs)", "US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives", "US OSHA Permissible Exposure Levels (PELs) - Table Z1", "US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide", "US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261", "US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Wastes", "US SARA Section 302 Extremely Hazardous Substances", "US Toxic Substances Control Act (TSCA) - Inventory", "USA: Chemical Facility Anti-Terrorism Standards - List Appendix A - 6CFR 27"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

- Inhalation and/or ingestion may produce serious health damage*.
- Cumulative effects may result following exposure*.

* (limited evidence).

Denmark Advisory list for selfclassification of dangerous substances

Substance	CAS	Suggested codes
hydrogen chloride		7647- 01- 0
phosgene		75- 44- 5

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- Classification of the mixture 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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