

SECTION 1: Identification

1.1. Product identifier

Product form : Substance
Name : Silicon tetrachloride
CAS No : 10026-04-7
Formula : Cl₄Si
Other means of identification : Silicon tetrachloride
Product group : Core Products

1.2. Recommended use and restrictions on use

Recommended uses and restrictions : Industrial use

1.3. Supplier

Praxair Canada inc.
1200 – 1 City Centre Drive
Mississauga - Canada L5B 1M2
T 1-905-803-1600 - F 1-905-803-1682
www.praxair.ca

1.4. Emergency telephone number

Emergency number : 1-800-363-0042
Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product.
For routine information, contact your supplier or Praxair sales representative.

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-CA classification

Acute Tox. 1 (Oral) H300
Acute Tox. 2 (Inhalation) H330
Skin Corr. 1A H314
Eye Dam. 1 H318

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms :



GHS05

GHS06

Signal word : DANGER

Hazard statements : FATAL IF SWALLOWED OR IF INHALED
CAUSES SEVERE SKIN BURNS AND EYE DAMAGE
REACTS VIOLENTLY WITH WATER
CORROSIVE TO THE RESPIRATORY TRACT

Precautionary statements : Do not handle until all safety precautions have been read and understood
Do not breathe gas, vapours
Wash hands thoroughly after handling
Use and store only outdoors or in a well-ventilated area
Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection
Store locked up



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Dispose of contents/container in accordance with container Supplier/owner instructions
Protect from sunlight when ambient temperature exceeds 52°C (125°F)
Use a back flow preventive device in the piping
Close valve after each use and when empty
Do not open valve until connected to equipment prepared for use
When returning cylinder, install leak tight valve outlet cap or plug
Use only with equipment of compatible materials of construction and rated for cylinder pressure

2.3. Other hazards

Other hazards not contributing to the classification : Reacts with moisture to form hydrochloric acid (aqueous hydrogen chloride). Trace amounts may be present in the product.

2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	CAS No.	% (Vol.)	Common Name (synonyms)
Silicon tetrachloride (Main constituent)	(CAS No) 10026-04-7	100	Silane, tetrachloro- / Silicon chloride / Tetrachlorosilane / Hydrochloric acid, tetrasilicone salt / Silicon tetrachloride- / Silicon tetrachloride

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician. . WARNING: To avoid possible chemical burns, the rescuer should avoid breathing any exhaled air from the victim.

First-aid measures after skin contact : In case of contact, immediately flush affected areas with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Rinse mouth. Do not induce vomiting.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/injuries : The primary hazard results from the formation of hydrochloric acid upon contact with moisture.

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : Obtain medical assistance.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media : Small fires close to stored silicon tetrachloride may be extinguished using carbon dioxide, dry chemical extinguishers, or dry sand, properly applied. In large fires where leakage may occur, water spray may be used **if applied in quantities sufficient to absorb the heat of reaction and knock down the hydrogen chloride fumes.**

5.2. Unsuitable extinguishing media

No additional information available

5.3. Specific hazards arising from the hazardous product

Fire hazard : Not flammable.

Reactivity : Reaction of this product with water, or in the presence of heat and air can form dense white clouds of silica particles and hydrogen chloride. These vapors are extremely irritating and may burn skin and eyes on contact.

Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.

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5.4. Special protective equipment and precautions for fire-fighters

Firefighting instructions	: DANGER! Toxic, corrosive liquid and vapor. Reacts violently with water to form hydrogen chloride fumes Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations.
Special protective equipment for fire fighters	: Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	: In large fires where leakage may occur, water spray may be used if applied in quantities sufficient to absorb the heat of reaction and knock down the hydrogen chloride fumes..
Other information	: Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by TC.)

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	: DANGER! Toxic, corrosive liquid and vapor.. Reacts violently with water to form hydrogen chloride fumes. Immediately evacuate all personnel from danger area. Do not approach area without self-contained breathing apparatus and protective clothing. If cylinders are leaking, reduce toxic vapors with water spray or fog. Reverse flow into cylinder may cause rupture. (See section 16.) Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area.
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6.2. Methods and materials for containment and cleaning up

Methods for cleaning up	: This material is a Toxic Gas. Any leaks should be handled by Emergency Response personnel. For assistance call your supplier.
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6.3. Reference to other sections

For further information refer to section 8: Exposure controls/personal protection

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	: Do not breathe gas/vapour. Avoid all contact with skin, eyes, or clothing. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.
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7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Appropriate engineering controls

Appropriate engineering controls : Use a local exhaust system, if necessary, to prevent oxygen deficiency and to keep hazardous fumes and gases below all applicable limits in the worker's breathing zone. **MECHANICAL ENGINEERING CONTROLS:** Not recommended as a primary ventilation system to control worker's exposure. **USE ONLY IN A CLOSED SYSTEM.** An explosion-proof, corrosion-resistant, forced-draft fume hood is preferred.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : Safety glasses. Face shield. Gloves.



Hand protection : Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection : Wear goggles and a face shield when transfilling or breaking transfer connections. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Respiratory protection : **Respiratory protection:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should be based on the current CSA standard Z94.4, "Selection, Care, and Use of Respirators." Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Other information : **Other protection :** Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid
 Appearance : No data available
 Colour : Colourless.
 Odour : Pungent.
 Odour threshold : No data available
 pH : Not applicable.
 pH solution : No data available



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Relative evaporation rate (butylacetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable.
Melting point	: -70 °C (-110.2°F)
Freezing point	: No data available
Boiling point	: 56.85 °C (138°F)
Flash point	: No data available
Critical temperature	: 233.8 °C (452.8°F)
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Vapour pressure	: 0.268 bar (3.89 psia) (@70°F/21.1°C)
Vapour pressure at 50 °C	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Relative density of saturated gas/air mixture	: No data available
Density	: 1.46 g/cm ³ (at 20 °C)
Relative gas density	: No data available
Solubility	: Water: No data available
Log Pow	: Not applicable.
Log Kow	: Not applicable.
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.
Viscosity, kinematic (calculated value) (40 °C)	: No data available
Explosive properties	: Not applicable.
Oxidizing properties	: None.
Flammability (solid, gas)	: Non flammable

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	: Reaction of this product with water, or in the presence of heat and air can form dense white clouds of silica particles and hydrogen chloride. These vapors are extremely irritating and may burn skin and eyes on contact.
Chemical stability	: Stable under normal conditions. Reacts with water to form hydrogen fluoride fumes.
Possibility of hazardous reactions	: May occur.
Conditions to avoid	: Avoid moisture in installation systems.
Incompatible materials	: Water. Bases. Organic materials. Potassium. Sodium. It reacts rapidly (exothermically) with alcohols, primary and secondary amines, ammonia, and other compounds containing active hydrogen atoms.
Hazardous decomposition products	: Thermal decomposition may produce : Hydrochloric acid. Silicon oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Oral: FATAL IF SWALLOWED.
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Inhalation: FATAL IF INHALED.

Silicon tetrachloride (f)10026-04-7	
LC50 inhalation rat (ppm)	750 ppm/1h
ATE CA (oral)	0.50000000 mg/kg bodyweight
ATE CA (gases)	375.00000000 ppmv/4h

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ATE CA (vapours)	0.50000000 mg/l/4h
ATE CA (dust,mist)	0.05000000 mg/l/4h

Skin corrosion/irritation	: CAUSES SEVERE SKIN BURNS AND EYE DAMAGE. pH: Not applicable.
Serious eye damage/irritation	: CAUSES SERIOUS EYE DAMAGE. pH: Not applicable.
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

12.2. Persistence and degradability

Silicon tetrachloride (10026-04-7)

Persistence and degradability : No ecological damage caused by this product.

12.3. Bioaccumulative potential

Silicon tetrachloride (10026-04-7)

Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Silicon tetrachloride (10026-04-7)

Mobility in soil	No data available.
Log Pow	Not applicable.
Log Kow	Not applicable.

12.5. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.
Effect on the ozone layer : None

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

TDG

UN-No. (TDG) : UN1818

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Packing group : II - Medium Danger
TDG Primary Hazard Classes : 8 - Class 8 - Corrosives
Proper shipping name : SILICON TETRACHLORIDE

Explosive Limit and Limited Quantity Index : 0
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : Forbidden

14.3. Air and sea transport

IMDG

UN-No. (IMDG) : 1818
Proper Shipping Name (IMDG) : SILICON TETRACHLORIDE
Class (IMDG) : 8 - Corrosive substances
Packing group (IMDG) : II - substances presenting medium danger

IATA

UN-No. (IATA) : 1818
Proper Shipping Name (IATA) : Silicon tetrachloride
Class (IATA) : 8 - Corrosives
Packing group (IATA) : II - Medium Danger

SECTION 15: Regulatory information

15.1. National regulations

Silicon tetrachloride (10026-04-7)

Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

Silicon tetrachloride (10026-04-7)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on INSQ (Mexican National Inventory of Chemical Substances)

SECTION 16: Other information

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Other information

: When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Praxair Canada Inc, SDSs are furnished on sale or delivery by Praxair Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from www.praxair.ca. If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write Praxair Canada Inc, (Phone: 1-888-257-5149; Address: Praxair Canada Inc, 1 City Centre Drive, Suite 1200, Mississauga, Ontario, L5B 1M2).

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NFPA health hazard

: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard

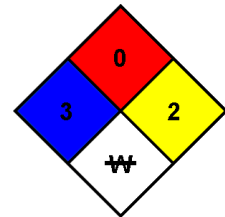
: 0 - Materials that will not burn.

NFPA reactivity

: 2 - Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.

NFPA specific hazard

: W - Unusual reactivity with water. This indicates a potential hazard using water to fight a fire involving this material.



HMIS III Rating

Health

: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability

: 0 Minimal Hazard - Materials that will not burn

Physical

: 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.

SDS Canada (GHS) - Praxair

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