Silicon tetrachloride

Safety Data Sheet P-4824

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1984 Revision date: 12/12/2016 Supersedes: 10/24/2016

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Name	:	Silicon tetrachloride
CAS No	:	10026-04-7
Formula	:	Cl4Si
Other means of identification	:	Chlorosilane A-160 / Tetrachlorosilane / Silicon Chloride / Silicon Tetrachloride

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Industrial use. Use as directed.

1.3. Details of the supplier of the safety data sheet

Medical Testing Solutions
20283 SR 7 #300, Boca Raton, FL 33498
www.medicaltestingsolutions.com

1.4. Emergency telephone number

Emergency number	:	(954) 603-9046

We are available Monday to Friday, 9:00 A.M -5:00 P.M.

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US classification

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

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :

GHS05 GHS06

Signal word (GHS-US) : DANGER

Hazard statements (GHS-US) :
H300+H330 - FATAL IF SWALLOWED OR IF INHALED
H314 - CAUSES SEVERE SKIN BURNS AND EYE DAMAGE
EUH-014 - REACTS VIOLENTLY WITH WATER
CGA-HG22 - CORROSIVE TO THE RESPIRATORY TRACT

Precautionary statements (GHS-US) :
P202 - Do not handle until all safety precautions have been read and understood
P260 - Do not breathe vapors
P262 - Do not get in eyes, on skin, or on clothing
P264 - Wash hands thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271+P403 - Use and store only outdoors or in a well-ventilated place
P280+P284 - Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection
P405 - Store locked up

P501 - Dispose of contents/container in accordance with container Supplier/owner instructions
CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG20+CGA-PG10 - Use only with equipment of compatible materials of construction and rated for cylinder pressure
CGA-PG12 - Do not open valve until connected to equipment prepared for use
CGA-PG18 - When returning cylinder, install leak tight valve outlet cap or plug
CGA-PG06 - Close valve after each use and when empty
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

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 US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance

Name : Silicon tetrachloride

CAS No : 10026-04-7

Name	Product identifier	%
Silicon tetrachloride	(CAS No) 10026-04-7	

3.2. Mixture

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, both acute and delayed

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

4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

SECTION 5: Firefighting measures

5.1. 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 quanitities sufficient to absorb the heat of reaction and knock down the hydrogen chloride fumes.**.

5.2. Special hazards arising from the substance or mixture

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.

5.3. Advice for firefighters

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 OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

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 quanitities 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 DOT.).

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.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release. Reduce vapor with fog or fine water spray. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not breathe gas/vapor. 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.

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.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Silicon tetrachloride (10026-04-7)	
ACGIH	Not established
USA OSHA	Not established

8.2. Exposure 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.

Eye protection : Provide readily accessible eye wash stations and safety showers. Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Respiratory protection	:	When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).
Other information	:	Keep suitable chemically resistant protective clothing readily available for emergency use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Color	:	Colorless
Odor	:	Pungent
Odor threshold	:	No data available
pH	:	Not applicable.
Relative evaporation rate (butyl acetate=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
Flammability (solid, gas)	:	No data available
Vapor pressure	:	0.268 bar (3.89 psia) (@70°F/21.1°C)
Relative vapor density at 20 °C	:	No data available
Relative density	:	No data available
Density	:	1.46 g/cm³ (at 20 °C)
Solubility	:	Water: No data available
Log Pow	:	Not applicable.
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosion limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. 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.

10.2. Chemical stability

Stable under normal conditions. Reacts with water to form hydrogen fluoride fumes.

10.3. Possibility of hazardous reactions

May occur.

10.4. Conditions to avoid

Avoid moisture in installation systems.

10.5. 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.

10.6. Hazardous decomposition products

Thermal decomposition may produce : Hydrochloric acid. Silicon oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: FATAL IF SWALLOWED. Inhalation: FATAL IF INHALED.

Silicon tetrachloride (\f)10026-04-7	
LC50 inhalation rat (ppm)	750 ppm/1h
ATE US (oral)	5.000 mg/kg body weight
ATE US (gases)	375.000 ppmV/4h
ATE US (vapors)	0.500 mg/l/4h
ATE US (dust, mist)	0.050 mg/l/4h

Silicon tetrachloride (10026-04-7)	
LC50 inhalation rat (ppm)	8000 ppm/4h
ATE US (gases)	8000.000 ppmV/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.

12.5. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.

Effect on ozone layer : None

SECTION 13: Disposal considerations

13.1. Waste treatment methods

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

SECTION 14: Transport information

In accordance with DOT

Transport document description : UN1818 Silicon tetrachloride, 8, II

UN-No.(DOT) : UN1818

Proper Shipping Name (DOT) : Silicon tetrachloride

Class (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136

Hazard labels (DOT) : 8 - Corrosive

Packing group (DOT) : II - Medium Danger

DOT Special Provisions (49 CFR 172.102) : A3 - For combination packaging, if glass inner packaging (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packaging
A6 - For combination packaging, if plastic inner packaging are used, they must be packed in tightly closed metal receptacles before packing in outer packaging
B2 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks are not authorized
B6 - Packaging shall be made of steel
T10 - 4 6 mm Prohibited 178.275(g)(3)
TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = 95 / (1 + a (tr - tf)) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: a = (d15 - d50) / 35d50 Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively
TP7 - The vapor space must be purged of air by nitrogen or other means
TP13 - Self-contained breathing apparatus must be provided when this hazardous material is transported by sea

Additional information

Emergency Response Guide (ERG) Number : 157

Other information : No supplementary information available.

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

Transport by sea

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

Air transport

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. US Federal regulations

Silicon tetrachloride (10026-04-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Delayed (chronic) health hazard Reactive hazard Immediate (acute) health hazard

15.2. International regulations

CANADA

Silicon tetrachloride (10026-04-7)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Silicon tetrachloride (10026-04-7)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National 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 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 Canadian IDL (Ingredient Disclosure List) Listed on INSQ (Mexican National Inventory of Chemical Substances)

15.3. US State regulations

Silicon tetrachloride(10026-04-7)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - New Jersey - Right to Know Hazardous Substance List

Silicon tetrachloride (10026-04-7)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

Silicon tetrachloride (10026-04-7)
U.S. - New Jersey - Right to Know Hazardous Substance List

SECTION 16: Other information

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, 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, Inc, it is the user's obligation to determine the conditions of safe use of the product

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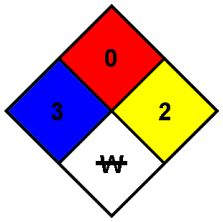
NFPA health hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

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

Physical : 2 Moderate Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.