Safety Data Sheet

Issue Date: 23-Aug-2023 **Revision Date:** 23-Aug-2023 **Version** 1

1. IDENTIFICATION

Product identifier

Product Name Silicon Tetrachloride

Other means of identification

SDS #

Synonyms Silane, tetrachloro-; Silicon chloride (SiCl4); Tetrachlorosilane; SiCl4; Silicon chloride; UN1818.

UN/ID No UN1818

Recommended use of the chemical and restrictions on use

Recommended Use Synthetic/Analytical chemistry.

Details of the supplier of the safety data sheet

Supplier Address

Electronic Fluorocarbons, LLC.
3266 Bergey Road
Hatfield, PA 19440
Email: efsafety@efgases.com

Emergency telephone number

Company Phone Number 215-443-9600

Emergency Telephone INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Colorless gas **Physical state** Gas **Odor** Pungent

Classification

Acute toxicity - Inhalation	Category 2
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Gases under pressure	Compressed gas
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) Resp. tract irritation	Category 3

Signal Word

Danger

Hazard statements

Fatal if inhaled
Causes severe skin burns and eye damage
May cause respiratory irritation

Precautionary Statements - Prevention
Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wear respiratory protection.
Wash face, hands, and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response
Immediately call a poison center or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a poison center or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Immediately call a poison center or doctor/physician
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting

Precautionary Statements - Storage
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Protect from sunlight

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms Silane, tetrachloro-; Silicon chloride (SiF4); Tetrachlorosilane; SiCl4; Silicon chloride; UN1818.

Chemical name	CAS No	Weight-%
Silicon tetrachloride	10026-04-7	100

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

Description of first aid measures

Eye Contact Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Skin Contact Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Inhalation Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt, or waistband.

Ingestion No specific data.

Self-Protection of the First Aider No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Most important symptoms and effects, both acute and delayed.

Symptoms Causes severe skin burns and eye damage. Fatal if inhaled. Contact with rapidly expanding gas may cause burns or frostbite.

Indication of any immediate medical attention and special treatment needed.

Notes to Physician Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media None known.

Specific Hazards Arising from the Chemical
Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous combustion products Decomposition products may include the following materials: halogenated compounds. Metal oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For Emergency Responders If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-

emergency personnel".

Environmental precautions

Environmental precautions Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Small spill: Immediately contact emergency personnel. Stop leak, if without risk. Large spill: Immediately contact emergency personnel. Stop leaking, if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin, and clothing. Avoid breathing gas. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement. Eating, drinking, and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands, and face before eating, drinking, and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities.

Storage Conditions Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Incompatible Materials Extremely reactive or incompatible with the following materials: acids, alcohols, bases, metal salts, metals, oxidizing materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical name	AIHA WEEL (USA, 7/2018)	OSHA PEL	NIOSH IDLH
Silicon tetrachloride 10026-04-7	CEIL: 1 ppm	-	IDLH: 250 mg/m^3 F

Appropriate engineering controls

Engineering Controls Use only with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures, such as personal protective equipment

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

Skin and Body Protection Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory Protection Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

General Hygiene Considerations Wash hands, forearms, and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Liquid		
Appearance	Clear to yellowish liquid	**Odor**	Pungent
Color	Clear to yellow	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	No data available	
Melting point / freezing point	-68.9 °C / -92 °F	
Initial boiling point	56.9 °C / 134.4 °F	
Critical Temperature	233.65 °C/ 452.6°F	
Flash point	No data available	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	Not determined	
Flammability Limit in Air		
Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	No data available	
Vapor Pressure	26 kPa(195.02 mm Hg)(room temp.)	
Vapor Density	5.9	(Air=1)
Relative Density	1.48	
Water Solubility	Not determined	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Autoignition temperature	>650 °C (1202 °F)	
Hyphen	Not determined	

Kinematic viscosity	0.0065 cm^2/s (0.35 cSt) (room temp.)
Dynamic Viscosity	Not determined
Explosive Properties	Not determined
Oxidizing Properties	Not determined
Other information	
Molecular weight	169.9 g/mole

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
Under normal conditions of storage and use, hazardous reactions will not occur.

Hazardous Polymerization Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible materials
Extremely reactive or incompatible with the following materials: acids, alcohols, bases, metal salts, metals, oxidizing materials.

Hazardous decomposition products
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Causes serious eye irritation.

Skin Contact Causes skin irritation.

Inhalation Fatal if inhaled. May cause respiratory irritation.

Ingestion No known significant effects or critical hazards.

Component Information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
silicon tetrachloride	LC50 Inhalation Gas. LD50 Oral	Rat Rat	750 ppm 238 mg/kg	1 hours -

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
silicon tetrachloride	Eyes - Moderate irritant Skin - Severe irritant	Rabbit Rabbit	- -	24 hours 20 mg 24 hours 500 mg	- -

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Causes severe skin burns.

Serious eye damage/eye irritation Causes severe eye damage.

Carcinogenicity Based on the information provided, this product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Inhalation (gases)	375 ppm

12. ECOLOGICAL INFORMATION

Ecotoxicity
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence/Degradability
Not determined.

Bioaccumulation
There is no data for this product.

Mobility
Not determined

Other adverse effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT

UN/ID No	UN1818
Proper Shipping Name	Silicon tetrachloride
Transport hazard class(es)	8

Packing group	II
Environmental hazards	No

IATA

UN/ID No	UN1818
Proper Shipping Name	Silicon tetrachloride
Transport hazard class(es)	8

Packing group	II
Environmental hazards	No

IMDG

UN number or ID number	UN1818
Proper Shipping Name	Silicon tetrachloride
Transport hazard class(es)	8

Packing group	II
Environmental hazards	No

TGD

UN/ID No	UN1818
Proper Shipping Name	Silicon tetrachloride
Transport hazard class(es)	8

Packing group	II
Environmental hazards	No

Mexico

UN/ID No	UN1818
Proper Shipping Name	Silicon tetrachloride
Transport hazard class(es)	8

Packing group II
Environmental hazards No

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Additional Information

DOT Classification Inhalation Hazard Zone C

Limited Quantity
Yes

Packaging instruction
Passenger aircraft
Quantity limitation: 1L

Cargo aircraft
Quantity limitation: 30 L

Special Provisions
A3, A6, B2, B6, IB2, T7, TP2, TP7, T3

TDG Classification Product classified as per the following sections of the Transportation of Dangerous Good Regulations: 2.40-2.42 (Class 8)
Explosive Limit and Limited Quantity Index 1
Passenger Carrying Road or Rail Index 1

IATA **Quantity limitation** Passenger and Cargo Aircraft: 1 L. Cargo Aircraft Only: 30 L
Limited Quantities – Passenger Aircraft: 0.5 L

Special precautions for user **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments Not available

15. REGULATORY INFORMATION

International Inventories

Chemical name	TSCA	TSCA Inventory Status	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AIIC
Silicon tetrachloride	X	ACTIVE	X	X	X	X	X	X	X

Legend:
TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*
DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*
EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*
ENCS *- Japan Existing and New Chemical Substances*
IECSC *- China Inventory of Existing Chemical Substances*
KECL *- Korean Existing and Evaluated Chemical Substances*
PICCS *- Philippines Inventory of Chemicals and Chemical Substances*
AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 311/312 Hazard Categories

Acute health hazard Yes
Chronic Health Hazard No
Fire hazard No

Sudden Release of Pressure Hazard	Yes
Reactive Hazard	No

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Silicon tetrachloride 10026-04-7	X		

16. OTHER INFORMATION

NFPA	**Health hazards**	**Flammability**	**Instability**	**Special hazards**
	4	0	2	-
HMIS	**Health hazards**	**Flammability**	**Physical hazards**	**Personal Protection**
	3	0	0	Not determined

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Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet