Safety Data Sheet

Version 1.2
Revision Date 10/20/2024

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	**Silicon tetrafluoride**
Chemical Formula	SiF_4
Product Use	Industrial use; use as directed.
CAS No.	7783-61-1
Supplier Address	ISOFLEX USA PO Box 472615 San Francisco CA 94147 United States
Telephone	+1 415-440-4433
Fax	+1 415-563-4433
Emergency Phone Number	+1 800-535-5053 (INFOTRAC)
Email	iusa@isoflex.com
Website	www.isoflex.com
Preparation Information	ISOFLEX USA Product Safety +1 415-440-4433

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS US Classification

Press. Gas (Comp.)	H280
Acute Tox. 2 (inhalation: gas)	H330
Skin Corr. 1A	H314
Eye Dam. 1	H318

GHS US Labeling

Hazard Pictograms (GHS US)

Signal word (GHS US) **Danger**

Hazard statement(s)

H280	CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
H314	CAUSES SEVERE SKIN BURNS AND EYE DAMAGE
H330	FATAL IF INHALED
CGA-HG22	CORROSIVE TO THE RESPIRATORY TRACT

Precautionary statement(s)

P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe gas/vapors.
P262	Do not get in eyes, on skin, or on clothing.
P264	Wash exposed skin thoroughly after handling.
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.
P303, P361, P353, P363, P310	IF ON SKIN OR (HAIR): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. Immediately call a poison center or doctor/physician.
CGA-PG34	SPECIFIC TREATMENT: Immediately apply calcium gluconate or equivalent to affected areas.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P310	Immediately call a poison center or doctor/physician.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Contact an ophthalmologist immediately.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/ international regulations. Contact supplier for any special requirements.
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).

Hazards not otherwise classified (HNOC) or not covered by GHS: None

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3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name:	Silicon tetrafluoride
CAS No.:	7783-61-1
Chemical Formula:	SiF_4
Concentration:	100%

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4. FIRST AID MEASURES

Inhalation Exposure

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.

Dermal Exposure

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.

Soak burned areas in ice and, if available, an aqueous solution of 0.2% benzethonium chloride (aka Hyamine 1622 solution) or zephiran chloride (aka benzalkonium chloride solution). Alternatively, apply calcium gluconate cream to affected areas on the skin.

Eye Exposure	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.
Ingestion	Ingestion is not considered a potential route of exposure.
Notes to Physician	Do not give morphine, barbiturates, or cardiac or respiratory stimulants.

5. FIREFIGHTING MEASURES

Suitable Extinguishing Media	Foam, dry chemical, carbon dioxide.
Unsuitable Extinguishing Media	Water may be ineffective.
Reactivity	Reacts with water to form hydrogen fluoride fumes.
Firefighting Instructions	DANGER! Toxic, corrosive, high-pressure gas. 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 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L – Fire Protection.
Special Protective Equipment for Firefighters	Standard protective clothing and equipment (Self Contained Breathing Apparatus) for firefighters. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray get from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.)

6. ACCIDENTAL RELEASE MEASURES

General Measures	Reacts with water to form hydrogen fluoride fumes. Danger: Toxic. Corrosive. Wear a self-contained breathing apparatus and appropriate personal protective equipment (PPE) (gas tight, chemical-protective). Evacuate personnel to a safe area. Approach suspected leak area with caution. Remove all sources of ignition. Toxic, corrosive vapor can spread from spill. Ventilate area or move container to a well-ventilated area. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.
Environmental Precautions	Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with container supplier/owner instructions.
Reference to Other Sections:	See also sections 8 and 13.

7. HANDLING AND STORAGE

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 (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.

Conditions for Safe Storage

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 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 sufficiency; 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters

Product	CAS No.
Silicon Tetrafluoride	7783-61-1
ACGIH	Not established
USA OSHA	Not established

Exposure Controls

Appropriate Engineering Controls

Use only in a closed system. A corrosion-resistant, forced-draft fume hood is preferred. LOCAL EXHAUST: A corrosion-resistant system is acceptable.
In semiconductor process gas and other suitable applications, it is recommended to use engineering controls such as gas cabinet enclosures, automatic gas panels (used to purge systems on cylinder changeout), excess-flow valves throughout the gas distribution system, double containment for the distribution system, and continuous gas monitors.

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 71.710 (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).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	Gas
Color	Colorless. Gives off white fumes in moist air.
Odor	Choking/Irritating

Safety Data

Molecular Weight:	104.08 g/mol
Relative Vapor Density:	No information available
Relative Density:	Not known
Density:	4.31 kg/m^3 (0.269 lb/ft^3) at 21.1°C (70°F)
Relative Gas Density:	3.6
Boiling Point:	-94.8°C (-138.6°F)
Critical Temperature:	-14.2°C (6.44°F)
Melting Point:	-86.8°C (-124.24°F)
Freezing Point:	No data available
Flash Point:	Not applicable
Autoignition Temperature:	Not applicable
Decomposition Temperature:	No data available
Upper Flammability Limit:	No data available
Lower Flammability Limit:	No data available
Water Solubility:	Reacts with water
pH:	Not applicable
Vapor Pressure:	Not applicable
Critical Pressure:	37.1 bar (538.9 psia)
Explosive Properties:	Not applicable
Oxidizing Properties:	No data available
Explosion Limits:	Non-flammable

Additional Information: Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10. STABILITY AND REACTIVITY

Reactivity	Reacts with water to form hydrogen fluoride fumes
Chemical Stability	Stable under normal conditions
Possible Hazardous Reactions	May occur

Conditions to Avoid	Avoid moisture in installation systems.
Incompatible Materials	Alkali metals. Water. Sodium. Trimethylamine.
Hazardous Decomposition Products	Fluorine. Silicon.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity: Not classified

Silicon tetrafluoride / CAS No. 7783-61-1	
LC50 Inhalation (Rat) [ppm]	922 ppm/1h
ATE US (Gases)	461 ppmV/4h

Skin	Causes severe skin burns.
Eye	Causes serious eye damage.
Inhalation	Not classified.
Germ cell mutagenicity	Not classified.

Carcinogenicity:	Not classified
Reproductive Toxicity:	Not classified
STOT - Single Exposure:	Not classified
STOT - Repeated Exposure:	Not classified
Aspiration Hazard:	Not classified

12. ECOLOGICAL INFORMATION

Ecology – General	No data available.
Persistence and Degradability	Not applicable for inorganic gases.
Bioaccumulative Potential	No data available.
Mobility in Soil	No data available.
Ecology – Soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
Other Adverse Effects	May cause pH changes in aqueous ecological systems.
Effect on Ozone Layer	None
Effect on Global Warming	No known effects

13. DISPOSAL CONSIDERATIONS

Product/Packaging	Do not attempt to dispose of residual or unused quantities. Return container to supplier.

14. TRANSPORT INFORMATION

DOT (US):

Transport Document Description	UN1859 Silicon tetrafluoride, 2.3
UN No.	UN1859

Proper Shipping Name	Silicon tetrafluoride
Hazard Class	2.3 – Class 2.3 – Poisonous gas 49 CFR 173.115
Hazard Labels	Poison gas 2.3 – Poison gas 8 – Corrosive substances

DOT Special Provisions (49 CFR 172.102)	2 – This material is poisonous by inhalation (see 171.8 of this subchapter) in Hazard Zone B (see 173.116(a) or 173.133(a) of this subchapter), and must be described as an inhalation hazard under the provisions of this subchapter.

Additional Information

Emergency Response Guide (ERG) No. 125;173

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)	1859
Proper Shipping Name (IMDG)	SILICON TETRAFLUORIDE
Class (IMDG)	2 – Gases
Division (IMDG)	2.3 – Toxic gases
MFAG No.	125

Air Transport

UN No. (IATA)	1859
Proper Shipping Name (IATA)	Silicon tetrafluoride
Class (IATA)	2 – Gases
Civil Aeronautics Law	Gases under pressure/Gases toxic under pressure

15. REGULATORY INFORMATION

US Federal

TSCA: Listed on the TSCA (Toxic Substances Control Act) inventory.

Canada

DSL: Listed on the Canadian DSL (Domestic Substances List)

EU Regulations

EEC/EINECS: Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National Regulations

Listed on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
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 Japanese ISHL (Industrial Safety and Health Law)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
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)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

US State Regulations

US – California – Proposition 65 – Carcinogens List	No
US – California – Proposition 65 – Developmental Toxicity	No
US – California – Proposition 65 – Reproductive Toxicity (Female)	No
US – California – Proposition 65 – Reproductive Toxicity (Male)	No
State or local regulations	US – New Jersey – Right to Know Hazardous Substance List

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16. OTHER INFORMATION

Prepared by	ISOFLEX USA PO Box 472615 San Francisco CA 94147 United States
Issuing Date	January 12, 2017
Revision Date	October 20, 2024
Revision Number	2
Revision Note	Update supplier address
NFPA Health Hazard	3 – Materials that, under emergency conditions, can cause serious or permanent injury.
NFPA Fire Hazard	0 – Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.
NFPA Instability	2 – Materials that readily undergo violent chemical change at elevated temperatures and pressures.
NFPA Specific Hazard	W – Unusual reactivity with water. This indicates a potential hazard using water to fight a fire involving this material.

ISOFLEX USA's Commonly Used Abbreviations and Acronyms*

ACGIH	American Conference of Governmental Industrial Hygienists
ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road
AICS	Australian Inventory of Chemical Substances
ALARA	As Low As Is Reasonably Achievable
AMU	Atomic Mass Unit
ANSI	American National Standards Institute
BLS	Basic Life Support
BOD5	Biochemical Oxygen Demand

CAM	Continuous Air Monitor
CAS	Chemical Abstracts Service (division of the American Chemical Society)
CEN	European Committee for Standardization
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CLP	Classification, Labelling and Packaging (European Union)
COD	Chemical Oxygen Demand
CPR	Controlled Products Regulations (Canada)
CWA	Clean Water Act (USA)
DAC	Derived Air Concentration (USA)
DOE	United States Department of Energy (USA)
DOT	United States Department of Transportation (USA)
DSL	Domestic Substances List (Canada)
EC50	Half Maximal Effective Concentration
ECL	Korean Existing Chemicals List
EINECS	European Inventory of Existing Commercial Chemical Substances
EHS	Environmentally Hazardous Substance
ELINCS	European List of Notified Chemical Substances
EMS	Emergency Response Procedures for Ships Carrying Dangerous Goods
EPA	Environmental Protection Agency (USA)
EPCRA	Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986
GHS	Globally Harmonized System
HMIS	Hazardous Materials Identification System (USA)
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBC	Intermediate Bulk Containers
ICAO	International Civil Aviation Organization
IDLH	Immediately Dangerous to Life or Health
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
IMDG	International Maritime Code for Dangerous Goods
LC50	Lethal concentration, 50 percent
LD50	Lethal dose, 50 percent
LDLO	Lethal Dose Low
LOEC	Lowest-Observed-Effective Concentration
MARPOL	International Convention for the Prevention of Pollution from Ships
MSHA	Mine Safety and Health Administration (USA)
NCRP	National Council on Radiation Protection & Measurements (USA)
NDSL	Non-Domestic Substances List (Canada)
NFPA	National Fire Protection Association (USA)
NIOSH	National Institute for Occupational Safety and Health (USA)
NOEC	No Observed Effect Concentration
N.O.S.	Not Otherwise Specified
NRC	Nuclear Regulatory Commission (USA)
NTP	National Toxicology Program (USA)
OSHA	Occupational Safety and Health Administration (USA)
PBT	Persistent Bioaccumulative and Toxic Chemical
PEL	Permissible Exposure Limit
PICCS	Philippines Inventory of Chemicals and Chemical Substances
PIH	Poisonous by Inhalation Hazard
RCRA	Resource Conservation and Recovery Act (USA)
RCT	Radiation Control Technician
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (Europe)
RID	Regulations Concerning the International Transport of Dangerous Goods by Rail
RQ	Reportable Quantity
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act (USA)
SNUR	Significant New Use Rule (TSCA)
TDG	Transportation of Dangerous Goods (Canada)
TIH	Toxic by Inhalation Hazard
TLV	Threshold Limit Value

TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
UN	United Nations (Number)
VOC	Volatile Organic Compound
vPvB	Very Persistent Very Bioaccumulative Chemical
WGK	Wassergefährdungsklassen (Germany: Water Hazard Classes)
WHMIS	Workplace Hazardous Materials Information System

*One or more of the above-listed items may not appear in this document.

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