

Silicon tetrafluoride**SIF4_108-SE**

2.3 : Toxic gases



8 : Corrosive substances

Danger**SECTION 1. Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

Trade name	: Silicon tetrafluoride , SIF4, Silicon tetrafluoride N50
SDS Nr	: SIF4_108-SE replaces Silicon tetrafluoride "108" from 19/10/2012
Chemical description	: Silicon tetrafluoride CAS No :7783-61-1 EC No :232-015-5 Index No :---
Registration-No.	: Registration deadline not expired.
Chemical formula	: SiF4

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

Relevant identified uses	: Industrial and professional. Perform risk assessment prior to use. Test gas/Calibration gas. Laboratory use. Chemical reaction / Synthesis. Use for manufacture of electronic/photovoltaic components. Contact supplier for more information on uses.
Uses advised against	: Consumer use.

1.3. Details of the supplier of the safety data sheet

Company identification	: AIR LIQUIDE GAS AB Lundavägen 151 212 24 Malmö SWEDEN Tfn. 040 - 38 10 00, efter kontorstid 0220- 396 00
E-Mail address (competent person)	: Info.sweden@airliquide.com

1.4. Emergency telephone number

Emergency telephone number	: 112
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Silicon tetrafluoride

SIF4_108-SE

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

Hazard Class and Category Code Regulation EC 1272/2008 (CLP)

- **Health hazards** : Acute toxicity, Inhalation - Category 2 - Danger - (CLP : Acute Tox. 2) - H330
Skin corrosion - Category 1A - Danger - (CLP : Skin Corr. 1A) - H314
Serious eye damage - Category 1 - Danger - (CLP : Eye Dam. 1) - H318
- **Physical hazards** : Gases under pressure - Liquefied gas - Warning - (CLP : Press. Gas) - H280

2.2. Label elements

Labelling Regulation EC 1272/2008 (CLP)

• **Hazard pictograms**



- **Hazard pictograms code** : GHS06 - GHS05 - GHS04
- **Signal word** : Danger
- **Hazard statements** : H280 - Contains gas under pressure; may explode if heated.
H330 - Fatal if inhaled.
H314 - Causes severe skin burns and eye damage.
- **Supplemental hazard information** : EUH071 - Corrosive to respiratory tract.
: EUH071 supersedes H335 when assigned in the classification.
- **Precautionary statements**
 - **Prevention** : P260 - Do not breathe gas, vapours.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
 - **Response** : P304+P340+P315 - IF INHALED : Remove person to fresh air and keep comfortable for breathing. Get immediate medical advice / attention.
P305+P351+P338+P315 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice / attention.
P303+P361+P353+P315 - IF ON SKIN (or hair) : Take off immediately all contaminated clothing. Rinse skin with water/shower. Get immediate medical advice / attention.
 - **Storage** : P403 - Store in a well-ventilated place.
P405 - Store locked up.

2.3. Other hazards

: None.

SECTION 3. Composition/information on ingredients

3.1. Substance / 3.2. Mixture

Substance.

Substance name	Content [Vol-%]	CAS No	EC No	Index No	Registration No.	Classification
Silicon tetrafluoride	100 %	7783-61-1	232-015-5	----	* 2	Acute Tox. 2 (H330) Skin Corr. 1A (H314) Eye Dam 1 (H318) Press. Gas (Liq.) (H280)

Contains no other components or impurities which will influence the classification of the product.

* 1: Listed in Annex IV / V REACH, exempted from registration.

* 2: Registration deadline not expired.

* 3: Registration not required: Substance manufactured or imported < 1t/y.

Full text of R-phrases see section 16. Full text of H-statements see section 16.

Silicon tetrafluoride**SIF4_108-SE****SECTION 4. First aid measures****4.1. Description of first aid measures**

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes. In case of skin contact, wearing rubber gloves rub 2.5% calcium gluconate gel continuously into the affected area for 1.5 hours or until further medical care is available.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.

4.2. Most important symptoms and effects, both acute and delayed

- : Prolonged exposure to small concentrations may result in pulmonary oedema. May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product. Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea. Delayed adverse effects possible. Refer to section 11.

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

- : Treat with corticosteroid spray as soon as possible after inhalation. Obtain medical assistance.

SECTION 5. Fire-fighting measures**5.1. Extinguishing media**

- Suitable extinguishing media : Water spray or fog.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

- Specific hazards : Exposure to fire may cause containers to rupture/explode.
- Hazardous combustion products : None that are more toxic than the product itself.

5.3. Advice for fire-fighters

- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. If possible, stop flow of product. Use water spray or fog to knock down fire fumes if possible. Move containers away from the fire area if this can be done without risk.
- Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

Silicon tetrafluoride**SIF4_108-SE****SECTION 6. Accidental release measures****6.1. Personal precautions, protective equipment and emergency procedures**

- : Evacuate area.
- Try to stop release.
- Monitor concentration of released product.
- Ensure adequate air ventilation.
- Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
- Wear gas tight chemically protective clothing in combination with self contained breathing apparatus.
- Stay upwind.
- Act in accordance with local emergency plan.

6.2. Environmental precautions

- : Try to stop release.
- Reduce vapour with fog or fine water spray.

6.3. Methods and material for containment and cleaning up

- : Ventilate area.
- Wash contaminated equipment or sites of leaks with copious quantities of water.
- Hose down area with water.

6.4. Reference to other sections

- : See also sections 8 and 13.

SECTION 7. Handling and storage**7.1. Precautions for safe handling****Safe use of the product**

- : Consider pressure relief device(s) in gas installations.
- Only experienced and properly instructed persons should handle gases under pressure.
- The product must be handled in accordance with good industrial hygiene and safety procedures.
- Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
- Avoid exposure, obtain special instructions before use.
- Do not smoke while handling product.
- Ensure the complete gas system was (or is regularly) checked for leaks before use.
- Installation of a cross purge assembly between the cylinder and the regulator is recommended.
- Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service.
- Avoid suck back of water, acid and alkalis.
- Do not breathe gas.
- Avoid release of product into atmosphere.

Safe handling of the gas receptacle

- : Refer to supplier's container handling instructions.
- When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
- Do not allow backfeed into the container.
- Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
- If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
- Protect cylinders from physical damage; do not drag, roll, slide or drop.
- Never attempt to repair or modify container valves or safety relief devices.
- Damaged valves should be reported immediately to the supplier.
- Keep container valve outlets clean and free from contaminants particularly oil and water.
- Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
- Close container valve after each use and when empty, even if still connected to equipment.
- Never attempt to transfer gases from one cylinder/container to another.
- Never use direct flame or electrical heating devices to raise the pressure of a container.
- Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

AIR LIQUIDE GAS AB

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Silicon tetrafluoride**SIF4_108-SE****SECTION 7. Handling and storage)continued)****7.2. Conditions for safe storage, including any incompatibilities**

: Observe all regulations and local requirements regarding storage of containers.
Keep container below 50°C in a well ventilated place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials.
Containers should not be stored in conditions likely to encourage corrosion.

7.3. Specific end use(s)

: None.

SECTION 8. Exposure controls/personal protection**8.1. Control parameters**

DNEL: Derived no effect level (Workers) : No data available.

PNEC: Predicted no effect concentration : No data available.

8.2. Exposure controls

8.2.1. Appropriate engineering controls : Product to be handled in a closed system and under strictly controlled conditions. Preferably use only permanent leak-tight installations (e.g. welded pipes). Systems under pressure should be regularly checked for leakages. Gas detectors should be used when toxic gases may be released. Ensure exposure is below occupational exposure limits (where available). Provide adequate general and local exhaust ventilation. Consider work permit system e.g. for maintenance activities.

8.2.2. Individual protection measures, e.g. personal protective equipment : A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered:
PPE compliant to the recommended EN/ISO standards should be selected.

• **Eye/face protection** : Wear safety glasses with side shields.
Wear goggles and a face shield when transfilling or breaking transfer connections.
Standard EN 166 - Personal eye-protection.
Provide readily accessible eye wash stations and safety showers.

• **Skin protection**
- **Hand protection** : Wear working gloves when handling gas containers.
Standard EN 388 - Protective gloves against mechanical risk.
Wear chemically resistant protective gloves.
Standard EN 374 - Protective gloves against chemicals.
The breakthrough time of the selected gloves must be greater than the intended use period.
Consult glove manufacturer's product information on material suitability and material thickness.

- **Other** : Wear safety shoes while handling containers.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
Keep suitable chemically resistant protective clothing readily available for emergency use.
Keep suitable chemically resistant protective clothing readily available for emergency use.
Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals.

• **Respiratory protection** : Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known.
Use gas filters and full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers.
Recommended: Filter B (grey).
Consult respiratory device supplier's product information for the selection of the appropriate device.
Gas filters do not protect against oxygen deficiency.
Standard EN 14387 - Gas filter(s), combined filter(s) and full face mask - EN 136.
Keep self contained breathing apparatus readily available for emergency use.

Silicon tetrafluoride**SIF4_108-SE****SECTION 8. Exposure controls/personal protection)continued)**

Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.

• Thermal hazards : None necessary.

8.2.3. Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9. Physical and chemical properties**9.1. Information on basic physical and chemical properties****Appearance**

Physical state at 20°C / 101.3kPa : Gas.

Colour : Colourless. Gives off white fumes in moist air.

Odour : Pungent.

Odour threshold : Odour threshold is subjective and inadequate to warn for overexposure.

pH value : If dissolved in water pH-value will be affected.

Molar mass [g/mol] : 104

Melting point [°C] : -86.8

Boiling point [°C] : -95.2 (s)

Critical temperature [°C] : -14.1

Flash point [°C] : Not applicable for gases and gas-mixtures.

Evaporation rate)ether=1) : Not applicable for gases and gas-mixtures.

Flammability range [vol% in air] : Non flammable.

Vapour pressure [20°C] : Not applicable.

Relative density, gas %air=1% : 3.6

Relative density, liquid %water=1% : Not known.

Solubility in water [mg/l] : Completely soluble.

Partition coefficient n-octanol/water [log Kow] : Not applicable for inorganic gases.

Auto-ignition temperature [°C] : Not applicable.

Viscosity at 20°C [mPa.s] : Not applicable.

Explosive Properties : Not applicable.

Oxidising Properties : None.

9.2. Other information

Other data : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10. Stability and reactivity**10.1. Reactivity**

: No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

: Stable under normal conditions.

10.3. Possibility of hazardous reactions

: None.

Silicon tetrafluoride**SIF4_108-SE****SECTION 10. Stability and reactivity)continued)****10.4. Conditions to avoid**

: Avoid moisture in installation systems.

10.5. Incompatible materials

: Reacts with most metals in the presence of moisture, liberating hydrogen, an extremely flammable gas. With water causes rapid corrosion of some metals. Moisture.
Reacts with water to form corrosive acids.
May react violently with alkalis.
For additional information on compatibility refer to ISO 11114.

10.6. Hazardous decomposition products

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

SECTION 11. Toxicological information**11.1. Information on toxicological effects**

Acute toxicity	: Absorption of excessive F- can result in acute systemic fluorosis with hypocalcemia, interference with various metabolic functions and organ damage (heart, liver, kidneys).
Rat inhalation LC50 [ppm/4h]	: 225
Skin corrosion/irritation	: Causes severe burns.
Serious eye damage/irritation	: No known effects from this product.
Respiratory or skin sensitisation	: No known effects from this product.
Carcinogenicity	: No known effects from this product.
Germ cell mutagenicity	: No known effects from this product.
Reproductive toxicity	: No known effects from this product.
STOT-single exposure	: May cause nausea and irritation of the respiratory tract. Hydrolysis of silanes in the body forms silicic acid or hydrated silica.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	: Not applicable for gases and gas-mixtures.

SECTION 12. Ecological information**12.1. Toxicity**

: No data available.

12.2. Persistence and degradability

: Not applicable for inorganic gases.

12.3. Bioaccumulative potential

: No data available.

12.4. Mobility in soil

: Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Results of PBT and vPvB assessment

: No data available.

12.6. Other adverse effects

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

Silicon tetrafluoride**SIF4_108-SE****SECTION 12. Ecological information)continued)**

Effect on global warming : No known effects from this product.

SECTION 13. Disposal considerations**13.1. Waste treatment methods**

: Must not be discharged to atmosphere.
Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.org> for more guidance on suitable disposal methods.
Ensure that the emission levels from local regulations or operating permits are not exceeded.
Consult supplier for specific recommendations.

List of hazardous waste codes)from
Commission Decision 2001/118/EC)

: 16 05 04: Gases in pressure containers (including halons) containing dangerous substances.

13.2. Additional information

: None.

SECTION 14. Transport information

UN number : 1859

Labelling ADR, IMDG, IATA

: 8 : Corrosive substances
2.3 : Toxic gases

Transport by road/rail)ADR/RID)

Transport by air)ICAO-TI / IATA-DGR)

Transport by sea)IMDG)

Classification code : 2 TC

H.I. nr : 268

Tunnel Restriction : C/D : Passage forbidden through tunnels of category C when carried in tanks. Passage forbidden through tunnels of category D and E.

Emergency Schedule)EmS) - Fire : F-C

Emergency Schedule)EmS) - Spillage : S-U

14.6 Special precautions for user

Packing Instruction(s) : P200

Passenger and Cargo Aircraft : FORBIDDEN.

Cargo Aircraft only : FORBIDDEN.

Special precautions for user : 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 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.
- Ensure there is adequate ventilation.

Transport in bulk according to Annex II
of MARPOL 73/78 and the IBC Code : Not applicable.

Silicon tetrafluoride**SIF4_108-SE****SECTION 14. Transport information)continued)**

UN proper shipping name	: SILICON TETRAFLUORIDE
Transport hazard class(es)	: 2
Environmental hazards	: None.
Proper shipping name	: SILICON TETRAFLUORIDE
Class	: 2.3
Packing instruction	: P200
IMDG-Marine pollutant	: -
Proper shipping name (IATA)	: SILICON TETRAFLUORIDE
Class	: 2.3

SECTION 15. Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**EU legislation

Restrictions on use	: None.
Seveso directive 2012/18/EC	: Covered.

National legislation

National legislation	: Ensure all national/local regulations are observed.
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15.2. Chemical safety assessment

: This product is either exempt from REACH, does not meet the minimum volume threshold for a CSR or the CSA has not yet been carried out.

SECTION 16. Other information

Indication of changes	: Revised safety data sheet in accordance with commission regulation (EU) No 2015/830.
Training advice	: Ensure operators understand the toxicity hazard. Users of breathing apparatus must be trained.
List of full text of H-statements in section 3.	: H280 - Contains gas under pressure; may explode if heated. H314 - Causes severe skin burns and eye damage. H318 - Causes serious eye damage. H330 - Fatal if inhaled.
Further information	: This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
DISCLAIMER OF LIABILITY	: Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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