

SAFETY DATA SHEET

Silane

Section 1. Identification

Product identifier : Silane
Product code : Not available.
Chemical name : silane
Other means of identification : Silicon tetrahydride
Product type : Liquefied gas.

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

Product use : Not available.
Area of application : Industrial applications.

Identified uses

Intermediate

Manufacturer : REC Silicon Inc.
 119140 Rick Jones Way
 Silver Bow, Montana 59750
 United State of America
 406-496-9877
 Email: RECSiliconMSDS@recgroup.com

3322 Road N Northeast
 Moses Lake, Washington 98837
 United State of America
 509-766-9299

e-mail address of person responsible for this SDS : recsiliconSDS@recsilicon.com

Emergency telephone number (with hours of operation) : CHEMTREC, U.S. : 1-800-424-9300 CCN# 403
 CHEMTREC International: +1 (703) 527-3887

Section 2. Hazard identification

Classification of the substance or mixture : H220 FLAMMABLE GASES - Category 1
 H280 GASES UNDER PRESSURE - Liquefied gas
 SIMPLE ASPHYXIANTS - Category 1

GHS label elements

Hazard pictograms :**Signal word** : Danger

Hazard statements : H220 - Extremely flammable gas.
 H280 - Contains gas under pressure; may explode if heated.
 May displace oxygen and cause rapid suffocation.

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English (US)

Canada

Section 2. Hazard identification

Precautionary statements

- Prevention** : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Response** : P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - In case of leakage, eliminate all ignition sources.
- Storage** : P410 + P403 - Protect from sunlight. Store in a well-ventilated place.
- Disposal** : Not applicable.
- Supplemental label elements** : Keep container tightly closed. Use only with adequate ventilation. Do not enter storage areas and confined spaces unless adequately ventilated.

Section 3. Composition/information on ingredients

- Substance/mixture** : Substance
- Chemical name** : silane
- Other means of identification** : Silicon tetrahydride

CAS number/other identifiers

- CAS number** : 7803-62-5

| Ingredient name | Other names | % (v/v) | CAS number |
|-----------------|-------------|---------|------------|
| silane | - | 100 | 7803-62-5 |

Ranges if listed above for hazardous ingredient(s) are prescribed ranges. The actual concentration(s) or actual concentration range(s) are being withheld as a trade secret.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
- Inhalation** : 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. Get medical attention if adverse health effects persist or are severe.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area.
- Ingestion** : Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. As this product rapidly becomes a gas when released, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Liquid can cause burns similar to frostbite.

Section 4. First-aid measures

Inhalation : At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.

Skin contact : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Ingestion : Ingestion of liquid can cause burns similar to frostbite.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
frostbite

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
frostbite

Ingestion : Adverse symptoms may include the following:
frostbite

Indication of immediate medical attention and special treatment needed, if necessary

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

Specific treatments : No specific treatment.

Protection of first-aiders : 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.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : In case of fire, use water spray (fog), foam, dry chemical or CO₂. Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

Unsuitable extinguishing media : Do not use water jet. / CO₂

Specific hazards arising from the chemical : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Gas may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back, causing fire or explosion.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
metal oxide/oxides

Special protective actions for fire-fighters : 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. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

Section 5. Fire-fighting measures

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Accidental releases pose a serious fire or explosion hazard. 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. Shut off all ignition sources. No flares, smoking or flames in hazard area. 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 : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.

Advice on general occupational hygiene : 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 : Do not store above the following temperature: 51.67°C (125°F). 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). Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

| Ingredient name | Exposure limits |
|-----------------|---|
| silane | <p>CA Alberta Provincial (Canada, 6/2018). 8 hrs OEL: 5 ppm 8 hours. 8 hrs OEL: 6.6 mg/m³ 8 hours.</p> <p>CA British Columbia Provincial (Canada, 6/2022). TWA: 0.5 ppm 8 hours. STEL: 1 ppm 15 minutes.</p> <p>CA Ontario Provincial (Canada, 6/2019). TWA: 5 ppm 8 hours.</p> <p>CA Quebec Provincial (Canada, 6/2022). TWAEV: 5 ppm 8 hours. TWAEV: 6.6 mg/m³ 8 hours.</p> <p>CA Saskatchewan Provincial (Canada, 7/2013). STEL: 10 ppm 15 minutes. TWA: 5 ppm 8 hours.</p> |

Biological exposure indices

None known.

Appropriate 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. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

: 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. Ensure that eyewash stations and safety showers are close to the workstation location.

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: safety glasses with side-shields.

Skin protection

Hand 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. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. 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,

Section 8. Exposure controls/personal protection

consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Recommended: Gloves: Leather.

Follow safety instructions: OSHA Article 29 CFR 1910.132, 1910.136

Refer to European Standard: EN 388

- Body protection** : 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. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
- Other skin protection** : 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** : The gas can cause asphyxiation without warning by replacing the oxygen in the air. Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. If operating conditions cause high gas concentrations to be produced or any recommended or statutory exposure limit is exceeded, use an air-fed respirator or self-contained breathing apparatus. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: Reference should be made to monitoring standards, such as the following: OSHA 29 CFR 1910.134 / EN = European Standard (Norm) 149
- Thermal hazards** : If there is a risk of contact with the liquid, all protective equipment worn should be suitable for use with extremely low temperature materials.

Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance

- Physical state** : Gas.
- Color** : Colorless.
- Odor** : Repulsive.
- Odor threshold** : Not available.
- pH** : Not applicable.
- Melting point/freezing point** : -185°C (-301°F)
- Boiling point, initial boiling point, and boiling range** : -111.7°C (-169.1°F)
- Flash point** : Not applicable.
- Evaporation rate** : Not available.
- Flammability** : Not available.
- Lower and upper explosion limit/flammability limit** : Lower: 1.37%
Upper: 96%
- Vapor pressure** : Not applicable.
- Relative vapor density** : 1.3 [Air = 1]
- Relative density** : Not applicable.
- Solubility(ies)** :

| Media | Result |
|-------|-------------|
| water | Not soluble |

- Miscible with water** : No.

Section 9. Physical and chemical properties and safety characteristics

| | |
|---|------------------------------|
| Partition coefficient: n-octanol/water | : Not available. |
| Auto-ignition temperature | : Not applicable. |
| Decomposition temperature | : Not applicable. |
| Viscosity | : Not applicable. |
| Flow time (ISO 2431) | : Not available. |
| Molecular weight | : 32.12 g/mole |
| <u>Particle characteristics</u> | |
| Median particle size | : Not applicable. |
| <u>Other information</u> | |
| Physical/chemical properties comments | : No additional information. |

Section 10. Stability and reactivity

| | |
|---|--|
| Reactivity | : No specific test data related to reactivity available for this product or its ingredients. |
| Chemical stability | : The product is stable. |
| Possibility of hazardous reactions | : Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur. |
| Conditions to avoid | : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow gas to accumulate in low or confined areas. |
| Incompatible materials | : Incompatible materials: Oxidizer, air |
| Hazardous decomposition products | : Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary

Skin : Not available.

Eyes : Not available.

Respiratory : Not available.

Sensitization

Conclusion/Summary

Skin : Not available.

Section 11. Toxicological information

Respiratory : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Routes of entry anticipated: Inhalation.

Potential acute health effects

Eye contact : Liquid can cause burns similar to frostbite.

Inhalation : At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.

Skin contact : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Ingestion : Ingestion of liquid can cause burns similar to frostbite.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
frostbite

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
frostbite

Ingestion : Adverse symptoms may include the following:
frostbite

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Section 11. Toxicological information

- General** : No known significant effects or critical hazards.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Reproductive toxicity : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

N/A

Section 12. Ecological information

Toxicity

- Conclusion/Summary** : Not available.

Persistence and degradability

- Conclusion/Summary** : Not available.

Bioaccumulative potential

Not available.

Mobility in soil

- Soil/water partition coefficient (K_{oc})** : Not available.





- Other adverse effects** : No known significant effects or critical hazards.

Section 13. Disposal considerations

- Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

Section 14. Transport information

| | TDG Classification | DOT Classification | IMDG | IATA |
|----------------------------|--|--|---|--|
| UN number | UN2203 | UN2203 | UN2203 | UN2203 |
| UN proper shipping name | SILANE | Silane | SILANE | Silane |
| Transport hazard class(es) | 2.1  | 2.1  | 2.1  | 2.1  |
| Packing group | - | - | - | - |
| Environmental hazards | No. | No. | No. | No. |

Additional information

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2).

Explosive Limit and Limited Quantity Index 0

ERAP Index 25

Passenger Carrying Vessel Index Forbidden

Passenger Carrying Road or Rail Index Forbidden

Special provisions 38

DOT Classification : **Limited quantity** No.

Packaging instruction Exceptions: None. Non-bulk: 302. Bulk: None.

Quantity limitation Passenger aircraft/rail: Forbidden. Cargo aircraft: Forbidden.

IMDG : **Emergency schedules** F-D, S-U

IATA : **Quantity limitation** Passenger and Cargo Aircraft: Forbidden. Packaging instructions: Forbidden. Cargo Aircraft Only: Forbidden. Packaging instructions: Forbidden. Limited Quantities - Passenger Aircraft: Forbidden. Packaging instructions: Forbidden.

Special provisions A2

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.

Section 15. Regulatory information

Canadian lists

Canadian NPRI : This material is not listed.

CEPA Toxic substances : This material is not listed.

Canada inventory : This material is listed or exempted.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

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Not listed.

[Stockholm Convention on Persistent Organic Pollutants](#)

Not listed.

[Rotterdam Convention on Prior Informed Consent \(PIC\)](#)

Not listed.

[UNECE Aarhus Protocol on POPs and Heavy Metals](#)

Not listed.

Section 16. Other information

[History](#)

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Prepared by : Sphera

Key to abbreviations :

- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- HPR = Hazardous Products Regulations
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- N/A = Not available
- UN = United Nations

[Procedure used to derive the classification](#)

| Classification | Justification |
|--------------------------------------|-----------------------|
| FLAMMABLE GASES - Category 1 | On basis of test data |
| GASES UNDER PRESSURE - Liquefied gas | On basis of test data |
| SIMPLE ASPHYXIANTS - Category 1 | Expert judgment |

References : HPR = Hazardous Products Regulations

✓ Indicates information that has changed from previously issued version.

[Notice to reader](#)

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.