

### SECTION 1: Identification

#### 1.1. Identification

Product form : Substance  
 Substance name : Silane  
 CAS No : 7803-62-5  
 Product code : SG-1001-07374  
 Formula : SiH<sub>4</sub>  
 Synonyms : Silane, compressed / Silicon tetrahydride / Silicon hydride / Monosilane / Hydrogen silicide

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

Use of the substance/mixture : Semiconductor

#### 1.3. Details of the supplier of the safety data sheet

Air Liquide USA LLC and its affiliates  
 9811 Katy Freeway, Suite 100  
 Houston, TX 77024 - USA  
 T 1-800-819-1704  
[www.us.airliquide.com](http://www.us.airliquide.com)

#### 1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Pyrophoric Gas H250  
 Flammable gases H220  
 Category 1  
 Gases under pressure H280  
 Liquefied gas  
 Acute toxicity H332  
 (inhalation:gas)  
 Category 4

Full text of H statements : see section 16

#### 2.2. Label elements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H220 - Extremely flammable gas  
 H250 - Catches fire spontaneously if exposed to air  
 H280 - Contains gas under pressure; may explode if heated  
 H332 - Harmful if inhaled  
 CGA-HG01 - May cause frostbite  
 CGA-HG04 - May form explosive mixtures with air

Precautionary statements (GHS-US) :

P202 - Do not handle until all safety precautions have been read and understood  
 P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking  
 P222 - Do not allow contact with air  
 P261 - Avoid breathing gas  
 P271 - Use only outdoors or in a well-ventilated area  
 P280 - Wear eye protection, face protection, protective gloves, protective clothing  
 P302 - IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area, Get immediate medical advice/attention  
 P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing  
 P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

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P308+P313 - If exposed or concerned: Get medical advice/attention  
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely  
P381 - Eliminate all ignition sources if safe to do so  
P403 - Store in a well-ventilated place  
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations  
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)  
CGA-PG05 - Use a back flow preventive device in the piping  
CGA-PG06 - Close valve after each use and when empty  
CGA-PG10 - Use only with equipment rated for cylinder pressure  
CGA-PG14 - Approach suspected leak area with caution  
CGA-PG17 - Use only with equipment purged with inert gas or evacuated prior to discharge from cylinder  
CGA-PG18 - When returning cylinder, install leak tight valve outlet cap or plug  
CGA-PG21 - Open valve slowly  
CGA-PG12 - Do not open valve until connected to equipment prepared for use

### 2.3. Other hazards

Other hazards not contributing to the classification : Spontaneously flammable in air.

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/Information on ingredients

### 3.1. Substance

Name	Product identifier	%	GHS-US classification
Silane (Main constituent)	(CAS No) 7803-62-5	> 99	Pyr. Gas, H250 Flam. Gas 1, H220 Liquefied gas, H280 Acute Tox. 4 (Inhalation:gas), H332

Full text of H-phrases: see section 16

### 3.2. Mixture

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Apply artificial respiration with bag and mask if breathing stopped. Get immediate medical advice/attention.

First-aid measures after skin contact : Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

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

Symptoms/injuries after inhalation : Harmful if inhaled.

Symptoms/injuries after skin contact : May cause frostbite.

Symptoms/injuries after eye contact : Contact with the product may cause cold burns or frostbite.

Symptoms/injuries after ingestion : Ingestion is not considered a potential route of exposure.

Symptoms/injuries upon intravenous administration : Not known.

Chronic symptoms : Adverse effects not expected from this product.

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

If you feel unwell, seek medical advice. If breathing is difficult, give oxygen.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media : Do not use water jet to extinguish. Carbon dioxide.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : This product is flammable.

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- |                  |   |
|------------------|---|
| Explosion hazard | : Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries. May form flammable/explosive vapor-air mixture. In use may form pyrophoric vapor-air mixture. |
| Reactivity       | : Catches fire spontaneously if exposed to air.   |

### 5.3. Advice for firefighters

- |                                |  |
|--------------------------------|--|
| Firefighting instructions      | : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.             |
| Protection during firefighting | : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection. |

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

- |                  |                                |
|------------------|--------------------------------|
| General measures | : Ensure adequate ventilation. |
|------------------|--------------------------------|

#### 6.1.1. For non-emergency personnel

- |                      |   |
|----------------------|---|
| Protective equipment | : Wear protective equipment consistent with the site emergency plan.  |
| Emergency procedures | : Evacuate personnel to a safe area. Close doors and windows of adjacent premises. Keep containers closed. Mark the danger area. Seal off low-lying areas. Keep upwind. |

#### 6.1.2. For emergency responders

- |                      |  |
|----------------------|--|
| Protective equipment | : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Equip cleanup crew with proper protection.  |
| Emergency procedures | : Evacuate and limit access. Ventilate area. Remove ignition sources. Monitor concentration of released product. Consider the risk of potentially explosive atmospheres. Wear self-contained breathing apparatus when entering atmospheres of unknown contaminant concentration until proven to be safe. |

### 6.2. Environmental precautions

- Try to stop release.

### 6.3. Methods and material for containment and cleaning up

- |                         |   |
|-------------------------|---|
| For containment         | : Try to stop release if without risk.  |
| Methods for cleaning up | : Dispose of contents/container in accordance with local/regional/national/international regulations. |

### 6.4. Reference to other sections

- See also Sections 8 and 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

- |                                   |  |
|-----------------------------------|--|
| Additional hazards when processed | : Pressurized container: Do not pierce or burn, even after use. Use only with equipment rated for cylinder pressure. Close valve after each use and when empty. Handle empty containers with care because residual vapors are flammable. In use, may form flammable vapor-air mixture. In use may form pyrophoric vapor-air mixture. |
| Precautions for safe handling     | : Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Use only non-sparking tools.  |
| Hygiene measures                  | : Do not eat, drink or smoke when using this product.  |

### 7.2. Conditions for safe storage, including any incompatibilities

- |                        |  |
|------------------------|--|
| Technical measures     | : Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed.  |
| Storage conditions     | : Do not expose to temperatures exceeding 52 °C/ 125 °F. Keep container closed when not in use. Protect cylinders from physical damage; do not drag, roll, slide or drop. Store in well ventilated area. |
| Incompatible products  | : None known.  |
| Incompatible materials | : Oxidizing materials. Air. Water.   |

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Silane (7803-62-5)

ACGIH	ACGIH TWA (ppm)	5 ppm
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Silane (7803-62-5)		
NIOSH	NIOSH REL (TWA) (mg/m³)	7 mg/m³
NIOSH	NIOSH REL (TWA) (ppm)	5 ppm

### 8.2. Exposure controls

Appropriate engineering controls	: Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits (where available). Oxygen detectors should be used when asphyxiating gases may be released. Consider work permit system e.g. for maintenance activities. Preferably use only permanent leak-tight installations (e.g. welded pipes). Product to be handled in a closed system and under strictly controlled conditions.
Hand protection	: Wear working gloves when handling gas containers. Wear chemically resistant protective gloves when making or breaking process connections. Wear leather safety gloves. 29 CFR 1910.138: Hand protection.
Eye protection	: Wear safety glasses with side shields. Wear goggles and a face shield when transfilling or breaking transfer connections. 29 CFR 1910.133: Eye and Face Protection.
Skin and body protection	: Wear suitable protective clothing, e.g. lab coats, coveralls or flame resistant clothing.
Respiratory protection	: None necessary during normal and routine operations. See Sections 5 & 6.
Thermal hazard protection	: None necessary during normal and routine operations.
Environmental exposure controls	: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.
Other information	: Wear safety shoes while handling containers. 29 CFR 1910.136: Foot Protection.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Clear, colorless gas.
Color	: Colorless.
Odor	: strong repulsive
Odor threshold	: No data available
pH	: No data available
Melting point	: -186 °C
Freezing point	: -186 °C
Boiling point	: -111.15 °C
Critical temperature	: -2.45 °C
Critical pressure	: 4840 kPa
Flash point	: Not applicable.
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: See Section 2.1 and 2.2
Explosion limits	: 1 - 100 vol % Pyrophoric.
Explosive properties	: Not applicable.
Oxidizing properties	: None.
Vapor pressure	: 6894 bar
Relative density	: 0.55
Relative vapor density at 20 °C	: 1.1
Molecular mass	: 32.11 g/mol
Relative gas density	: Heavier than air
Solubility	: Water: No data available
Log Pow	: Not applicable for inorganic gases.
Auto-ignition temperature	: 20 °C
Decomposition temperature	: No data available
Viscosity	: No data available
Viscosity, kinematic	: Not applicable.
Viscosity, dynamic	: Not applicable.

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### 9.2. Other information

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

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Catches fire spontaneously if exposed to air.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

May react violently with oxidants. Can ignite spontaneously in air (fire cannot be put out). Can form spontaneous, violently explosive mixture in air.

### 10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

### 10.5. Incompatible materials

Air, Oxidizer. 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 : Inhalation:gas: Harmful if inhaled.

Silane (7803-62-5)	
LC50 inhalation rat (ppm)	9500 ppm/4h
ATE US (gases)	9500.000 ppmV/4h

Skin corrosion/irritation : Not classified  
Serious eye damage/irritation : Not classified  
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  
Symptoms/injuries after inhalation : Harmful if inhaled.  
Symptoms/injuries after skin contact : May cause frostbite.  
Symptoms/injuries after eye contact : Contact with the product may cause cold burns or frostbite.  
Symptoms/injuries after ingestion : Ingestion is not considered a potential route of exposure.  
Symptoms/injuries upon intravenous administration : Not known.  
Chronic symptoms : Adverse effects not expected from this product.

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : No data available.

### 12.2. Persistence and degradability

Silane (7803-62-5)	
Persistence and degradability	Not applicable for inorganic gases.

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### 12.3. Bioaccumulative potential

Silane (7803-62-5)	
Log Pow	Not applicable for inorganic gases.
Bioaccumulative potential	No data available.

### 12.4. Mobility in soil

Silane (7803-62-5)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

### 12.5. Other adverse effects

Effect on ozone layer	: None
Effect on the global warming	No known effects from this product

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste treatment methods	: Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into any place where its accumulation could be dangerous. Gases formed by combustion should be washed with water to remove silica. Ensure that the emission levels from local regulations or operating permits are not exceeded.
Waste disposal recommendations	: Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at <a href="http://www.cganet.com">www.cganet.com</a> for more guidance on suitable disposal methods.

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT

Transport document description	: UN2203 Silane, 2.1
UN-No.(DOT)	: UN2203
Proper Shipping Name (DOT)	: Silane
Class (DOT)	: 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115
Hazard labels (DOT)	: 2.1 - Flammable gas



DOT Packaging Non Bulk (49 CFR 173.xxx)	: 302
DOT Packaging Bulk (49 CFR 173.xxx)	: None
DOT Packaging Exceptions (49 CFR 173.xxx)	: None
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: Forbidden
DOT Vessel Stowage Location	: E - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded
DOT Vessel Stowage Other	: 40 - Stow "clear of living quarters", 57 - Stow "separated from" chlorine, 104 - Stow "separated from" bromine
Emergency Response Guide (ERG) Number	: 116
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.

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### TDG

Transport document description	: UN2203 SILANE, 2.1
UN-No. (TDG)	: UN2203
Proper Shipping Name	: SILANE
TDG Primary Hazard Classes	: 2.1 - Class 2.1 - Flammable Gas.
TDG Special Provisions	: 38 - A person must not handle, offer for transport or transport these dangerous goods in a large means of containment if they are in direct contact with the large means of containment. SOR/2014-306
ERAP Index	: 25
Explosive Limit and Limited Quantity Index	: 0
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	: Forbidden
Passenger Carrying Ship Index	: Forbidden

### Transport by sea

UN-No. (IMDG)	: 2203
Class (IMDG)	: 2 - Gases
MFAG-No	: 116

### Air transport

UN-No. (IATA)	: Forbidden
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## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Silane (7803-62-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2. International regulations

#### CANADA

#### Silane (7803-62-5)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification	Class A - Compressed Gas Class B Division 6 - Reactive Flammable Material
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### EU-Regulations

#### Silane (7803-62-5)

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

### National regulations

#### Silane (7803-62-5)

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)

### 15.3. US State regulations

#### Silane (7803-62-5)

State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List
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## SECTION 16: Other information

Other information	: This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product.
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Full text of H-phrases:

H220	Extremely flammable gas
H250	Catches fire spontaneously if exposed to air
H280	Contains gas under pressure; may explode if heated
H332	Harmful if inhaled

SDS US (GHS HazCom 2012)

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