

## Safety Data Sheet

**Section 1: Identification of the Substance/Mixture and of the Company/Undertaking****1.1 Product identifier**

<b>Product Name</b>	<b>Methylsilane</b>
<b>Synonyms</b>	Monomethylsilane
<b>CAS Number</b>	992-94-9
<b>Product Code</b>	60041
<b>EC Number</b>	213-598-5
<b>Molecular Formula</b>	:C 1:H 6:Si 1:

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

<b>Relevant identified use(s)</b>	Semiconductor Uses
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**1.3 Details of the supplier of the safety data sheet**

<b>Manufacturer</b>	Air Liquide 2700 Post Oak Blvd. Houston, TX 77056 United States www.us.airliquide.com sds@airliquide.com
<b>Telephone (Technical)</b>	713-896-2896
<b>Telephone (Technical)</b>	800-819-1704

**1.4 Emergency telephone number**

<b>Manufacturer</b>	800-424-9300 - CHEMTREC
<b>Manufacturer</b>	+1 703-527-3887 - Outside United States

**Section 2: Hazards Identification****EU/EEC**

According to Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]  
According to EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

**2.1 Classification of the substance or mixture**

<b>CLP</b>	Flammable Gases 1 - H220 Compressed Gas - H280
<b>DSD/DPD</b>	Extremely Flammable (F+) R12

**2.2 Label Elements**

CLP

**DANGER****Hazard statements** | H220 - Extremely flammable gas

H280 - Contains gas under pressure; may explode if heated

## Precautionary statements

**Prevention** | P210 - Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking.

**Response** | P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
P381 - Eliminate all ignition sources if safe to do so.

**Storage/Disposal** | P403 - Store in a well-ventilated place.

## DSD/DPD



**Risk phrases** | R12 - Extremely flammable.

**Safety phrases** | S9 - Keep container in a well ventilated place  
S16 - Keep away from sources of ignition - No Smoking.

## 2.3 Other Hazards

**CLP** | This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.  
According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

**DSD/DPD** | This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.  
This product is considered dangerous according to the European Directive 67/548/EEC.

## United States (US)

According to OSHA 29 CFR 1910.1200 HCS

## 2.1 Classification of the substance or mixture

**OSHA HCS 2012** | Flammable Gases 1 - H220  
Compressed Gas - H280  
Simple Asphyxiant

## 2.2 Label elements

OSHA HCS 2012

**DANGER**



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

## Precautionary statements

**Prevention** | Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking. - P210

**Response** | Leaking gas fire: Do not extinguish, unless leak can be stopped safely. - P377  
Eliminate all ignition sources if safe to do so. - P381

**Storage/Disposal** | Store in a well-ventilated place. - P403

## 2.3 Other hazards

**OSHA HCS 2012** | Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

## Canada

According to WHMIS

## 2.1 Classification of the substance or mixture

### WHMIS

- Compressed Gas - A
- Flammable Gases - B1

## 2.2 Label elements

### WHMIS



- Compressed Gas - A
- Flammable Gases - B1

## 2.3 Other hazards

### WHMIS

- In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

## 2.4 Other information

### NFPA



## Section 3 - Composition/Information on Ingredients

### 3.1 Substances

Composition				
Chemical Name	Identifiers	%	LD50/LC50	Classifications According to Regulation/Directive
Methylsilane	CAS:992-94-9 EINECS:213-598-5	>= 99%	NDA	EU DSD/DPD: Self Classified - F+, R12 EU CLP: Self Classified - Flam. Gas 1, H220; Press. Gas - Comp., H280 OSHA HCS 2012: Flam. Gas 1; Press. Gas - Comp.; Simp. Asphyx.

### 3.2 Mixtures

- Material does not meet the criteria of a mixture in accordance with Regulation (EC) No 1272/2008.

## Section 4 - First Aid Measures

### 4.1 Description of first aid measures

#### Inhalation

- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. If signs/symptoms continue, get medical attention.

#### Skin

- Although exposure is unlikely, in case of contact immediately flush skin with running water. If skin irritation develops get medical advice/attention.

#### Eye

- First aid is not expected to be necessary if material is used under ordinary conditions

and as recommended. If eye irritation persists: Get medical advice/attention.

#### Ingestion

- | Ingestion is not considered a potential route of exposure.

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

- | Refer to Section 11 - Toxicological Information.

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

#### Notes to Physician

- | All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

### 4.4 Other information

- | Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO GASES WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn. Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

## Section 5 - Firefighting Measures

### 5.1 Extinguishing media

**Suitable Extinguishing Media** | SMALL FIRES: Dry chemical or CO<sub>2</sub>.  
LARGE FIRES: Water spray or fog.

**Unsuitable Extinguishing Media** | No data available

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

**Unusual Fire and Explosion Hazards** | EXTREMELY FLAMMABLE  
Will form explosive mixtures with air.  
Vapors may travel to source of ignition and flash back.  
Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.  
Containers may explode when heated.  
Ruptured cylinders may rocket.

**Hazardous Combustion Products** | No data available

### 5.3 Advice for firefighters

- | Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.  
Wear positive pressure self-contained breathing apparatus (SCBA).  
DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED  
Move containers from fire area if you can do it without risk.  
FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.  
FIRE INVOLVING TANKS: ALWAYS stay away from tanks engulfed in fire.  
FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.  
FIRE INVOLVING TANKS: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.  
FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out.  
FIRE INVOLVING TANKS: Do not direct water at source of leak or safety devices; icing may occur.  
FIRE INVOLVING TANKS: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

## Section 6 - Accidental Release Measures

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

- Personal Precautions** | Ventilate the area before entry. Do not walk through spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Emergency Procedures** | ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. LARGE SPILL: Consider initial downwind evacuation for at least 800 meters (1/2 mile) Keep unauthorized personnel away. Keep out of low areas. Stay upwind.

### 6.2 Environmental precautions

- | Prevent entry into waterways, sewers, basements or confined areas.

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

- Containment/Clean-up Measures** | All equipment used when handling the product must be grounded. Stop leak if you can do it without risk. If possible, turn leaking containers so that gas escapes rather than liquid. Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container. Do not direct water at spill or source of leak. Isolate area until gas has dispersed.

### 6.4 Reference to other sections

- | Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

## Section 7 - Handling and Storage

### 7.1 Precautions for safe handling

- Handling** | Keep away from heat and ignition sources – No Smoking. Take precautionary measures against static charges. All equipment used when handling the product must be grounded. Use only non-sparking tools. Use only with adequate ventilation. Ventilate closed spaces before entering. Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Cylinders should be firmly secured to prevent falling or being knocked-over. Use explosion-proof - electrical, ventilating and/or lighting equipment. Do not attempt to repair, adjust, or in any other way modify cylinders. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container.

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

- Storage** | Cylinders should be stored in dry, well-ventilated areas away from sources of heat, ignition and direct sunlight. Do not allow area where cylinders are stored to exceed 52C (125F). Cylinders must be protected from the environment, and preferably kept at room temperature approximately 21C (70F). Protect cylinders against physical damage. Cylinders should be firmly secured to prevent falling or being knocked-over. Store locked up.

### 7.3 Specific end use(s)

- | Refer to Section 1.2 - Relevant identified uses.

## Section 8 - Exposure Controls/Personal Protection

### 8.1 Control parameters

- Exposure Limits/Guidelines** | Currently there are no applicable exposure limits established for this material.

## 8.2 Exposure controls

### Engineering Measures/Controls

- | Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Use explosion-proof - electrical, ventilating and/or lighting equipment.

### Personal Protective Equipment

#### Respiratory

- | In case of insufficient ventilation, wear suitable respiratory equipment.

#### Eye/Face

- | Wear safety glasses.

#### Skin/Body

- | Wear leather gloves when handling cylinders.

### Environmental Exposure Controls

- | Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

## Section 9 - Physical and Chemical Properties

### 9.1 Information on Physical and Chemical Properties

#### Material Description

Physical Form	Gas	Appearance/Description	Colorless gas with a repulsive odor.
Color	Colorless	Odor	Repulsive
Odor Threshold	Data lacking		

#### General Properties

Boiling Point	-57 C (-70.6 F)	Melting Point	-157 C (-250.6 F)
Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	1.6 Water=1	Water Solubility	Data lacking
Viscosity	Data lacking	Explosive Properties	Data lacking
Oxidizing Properties:	Data lacking		

#### Volatility

Vapor Pressure	192 psig	Vapor Density	Data lacking
Evaporation Rate	Data lacking		

#### Flammability

Flash Point	Data lacking	UEL	Data lacking
LEL	Data lacking	Autoignition	160 C (320 F)
Flammability (solid, gas)	Flammable gas.		

#### Environmental

Octanol/Water Partition coefficient	Data lacking		
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### 9.2 Other Information

- | No additional physical and chemical parameters noted.

## Section 10: Stability and Reactivity

### 10.1 Reactivity

- | No dangerous reaction known under conditions of normal use.

### 10.2 Chemical stability

- | Stable under normal temperatures and pressures.

### 10.3 Possibility of hazardous reactions

- | Hazardous polymerization will not occur.

## 10.4 Conditions to avoid

- | Excess heat, sparks, open flame.

## 10.5 Incompatible materials

- | Air, halogens, oxidizing agents.

## 10.6 Hazardous decomposition products

- | Silicon oxide, hydrogen, methane.

# Section 11 - Toxicological Information

## 11.1 Information on toxicological effects

GHS Properties	Classification
Acute toxicity	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Aspiration Hazard	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Carcinogenicity	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Germ Cell Mutagenicity	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Skin corrosion/Irritation	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Skin sensitization	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
STOT-RE	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
STOT-SE	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Toxicity for Reproduction	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Respiratory sensitization	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met
Serious eye damage/Irritation	EU/CLP • Classification criteria not met OSHA HCS 2012 • Classification criteria not met

## Potential Health Effects

### Inhalation

#### Acute (Immediate)

- | This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. If this material is released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with decreased levels of oxygen: increase in breathing and pulse rate, emotional upset, abnormal

fatigue, nausea, vomiting, collapse, loss of consciousness, convulsive movements, respiratory collapse and death.

**Chronic (Delayed)** | No data available

## Skin

**Acute (Immediate)** | Under normal conditions of use, no health effects are expected.

**Chronic (Delayed)** | No data available

## Eye

**Acute (Immediate)** | Under normal conditions of use, no health effects are expected.

**Chronic (Delayed)** | No data available

## Ingestion

**Acute (Immediate)** | Ingestion is not anticipated to be a likely route of exposure to this product.

**Chronic (Delayed)** | No data available

## Section 12 - Ecological Information

### 12.1 Toxicity

| Material data lacking.

### 12.2 Persistence and degradability

| Material data lacking.

### 12.3 Bioaccumulative potential

| Material data lacking.

### 12.4 Mobility in Soil

| Material data lacking.

### 12.5 Results of PBT and vPvB assessment

| No PBT and vPvB assessment has been conducted.

### 12.6 Other adverse effects

| No studies have been found.

## Section 13 - Disposal Considerations

### 13.1 Waste treatment methods

**Product waste** | Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

**Packaging waste** | Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

## Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN1954	Compressed Gas, Flammable, N.O.S. (Methylsilane)	2.1	NDA	NDA
TDG	UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S. (Methylsilane)	2.1	NDA	Potential Marine Pollutant



<b>IMO/IMDG</b>	UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S. (Methylsilane)	2.1	NDA	NDA
<b>IATA/ICAO</b>	UN1954	Compressed Gas, Flammable, N.O.S. (Methylsilane)	2.1	NDA	NDA

**14.6 Special precautions for user**

Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

**14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not relevant.

**14.8 Other information**

This material is forbidden on passenger aircraft.

## Section 15 - Regulatory Information

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

**SARA Hazard Classifications** | Acute, Fire, Pressure(Sudden Release of)

State Right To Know				
Component	CAS	MA	NJ	PA
Methylsilane	992-94-9	No	No	No

Inventory						
Component	CAS	Canada DSL	Canada NDSL	China	EU EINECS	EU ELNICS
Methylsilane	992-94-9	No	Yes	Yes	Yes	No

Inventory (Con't.)		
Component	CAS	TSCA
Methylsilane	992-94-9	Yes

**Canada****Labor****Canada - WHMIS - Classifications of Substances**

• Methylsilane 992-94-9 Not Listed

**Canada - WHMIS - Ingredient Disclosure List**

• Methylsilane 992-94-9 Not Listed

**Environment****Canada - CEPA - Priority Substances List**

• Methylsilane 992-94-9 Not Listed

**China****Environment****China - Ozone Depleting Substances - First Schedule**

• Methylsilane 992-94-9 Not Listed

**China - Ozone Depleting Substances - Second Schedule**

• Methylsilane	992-94-9	Not Listed
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**China - Ozone Depleting Substances - Third Schedule**

• Methylsilane	992-94-9	Not Listed
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**Other****China - Annex I & II - Controlled Chemicals Lists**

• Methylsilane	992-94-9	Not Listed
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**China - Dangerous Goods List**

• Methylsilane	992-94-9	Not Listed
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**China - Export Control List - Part I Chemicals**

• Methylsilane	992-94-9	Not Listed
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**Europe****Other****EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification**

• Methylsilane	992-94-9	Not Listed
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**EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits**

• Methylsilane	992-94-9	Not Listed
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**EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling**

• Methylsilane	992-94-9	Not Listed
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**EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations**

• Methylsilane	992-94-9	Not Listed
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**EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases**

• Methylsilane	992-94-9	Not Listed
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**Germany****Environment****Germany - TA Luft - Types and Classes**

• Methylsilane	992-94-9	Not Listed
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**Germany - Water Classification (VwVwS) - Annex 1**

• Methylsilane	992-94-9	Not Listed
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**Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes**

• Methylsilane	992-94-9	ID Number 567, hazard class 1 - low hazard to waters (footnote 13)
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**Germany - Water Classification (VwVwS) - Annex 3**

• Methylsilane	992-94-9	Not Listed
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**Other****Germany - Specifically Regulated Chemicals in TRGS**

• Methylsilane	992-94-9	Not Listed
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## Portugal

### Other

#### Portugal - Prohibited Substances

- Methylsilane

992-94-9

Not Listed

## United Kingdom

### Environment

#### United Kingdom - Pollution Inventory - Schedule 1 - Thresholds for Releases to Air

- Methylsilane

992-94-9

Not Listed

### Other

#### United Kingdom - Workplace Exposure Limits (WELs) - Substances in Review

- Methylsilane

992-94-9

Not Listed

#### United Kingdom - List of Dangerous Substances in Water

- Methylsilane

992-94-9

Not Listed

## United States

### Labor

#### U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

- Methylsilane

992-94-9

Not Listed

#### U.S. - OSHA - Specifically Regulated Chemicals

- Methylsilane

992-94-9

Not Listed

### Environment

#### U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

- Methylsilane

992-94-9

Not Listed

#### U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

- Methylsilane

992-94-9

Not Listed

#### U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

- Methylsilane

992-94-9

Not Listed

#### U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

- Methylsilane

992-94-9

Not Listed

#### U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

- Methylsilane

992-94-9

Not Listed

#### U.S. - CERCLA/SARA - Section 313 - Emission Reporting

- Methylsilane

992-94-9

Not Listed

#### U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

- Methylsilane

992-94-9

Not Listed

## United States - California

### Environment

#### U.S. - California - Proposition 65 - Carcinogens List

- Methylsilane

992-94-9

Not Listed

#### U.S. - California - Proposition 65 - Developmental Toxicity

• Methylsilane	992-94-9	Not Listed
<b>U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)</b>		
• Methylsilane	992-94-9	Not Listed
<b>U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)</b>		
• Methylsilane	992-94-9	Not Listed
<b>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</b>		
• Methylsilane	992-94-9	Not Listed
<b>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</b>		
• Methylsilane	992-94-9	Not Listed

## United States - Pennsylvania

### Labor

<b>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</b>		
• Methylsilane	992-94-9	Not Listed
<b>U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances</b>		
• Methylsilane	992-94-9	Not Listed

## 15.2 Chemical Safety Assessment

| No Chemical Safety Assessment has been carried out.

## Section 16 - Other Information

<b>Last Revision Date</b>	08/December/2014
<b>Preparation Date</b>	08/December/2014
<b>Disclaimer/Statement of Liability</b>	To the best of Air Liquide's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this gas mixture is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

### Key to abbreviations

NDA = No Data Available