**Section 1 - IDENTIFICATION**

**Manufacturer Information**
MATHESON TRI-GAS, INC. General Information: 1-800-416-2505
150 Allen Road, Suite 302 Emergency #: 1-800-424-9300 (CHEMTREC)
Basking Ridge, NJ 07920 Outside the US: 703-527-3887 (Call collect)

**Product Identifier:** SILANE

**Trade Names/Synonyms**
MTG MSDS 78; MONOSILANE (SIH4); SILICANE; SILICON HYDRIDE (SIH4); SILICON TETRAHYDRIDE;
SILICON HYDRIDE; MONOSILANE; STCC 4920168; UN 2203; H4Si; RTECS: VV1400000

**Chemical Family**
hydrides

**Product Use**
industrial

**Restrictions on Use**
None known.

**Section 2 - HAZARDS IDENTIFICATION**

**GHS Classification**
- Flammable gas, Category 1
- Gas under pressure, Liquefied gas
- Acute toxicity, Category 4
- Skin corrosion/irritation, Category 2
- Eye damage/irritation, Category 2A
- Specific target organ systemic toxicity following single exposure, Category 3
- Specific target organ systemic toxicity following repeated exposure, Category 2

**GHS LABEL ELEMENTS**

**Signal Word**
DANGER

**Hazard Statement(s)**
- Extremely flammable gas
- Contains gas under pressure; may explode if heated
- Harmful if inhaled
- Causes skin irritation
- Causes serious eye irritation
- May cause respiratory irritation
May cause damage to organs through prolonged or repeated exposure

Precautionary Statement(s)
Keep away from heat, sparks, open flame, and hot surfaces - No smoking. Wear appropriate protective gloves and eye/face protection. Do not breathe gas. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash before re-use. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Wash hands after handling. Call a POISON CENTER or doctor/physician if you feel unwell. Specific treatment may be needed, see first aid section of Safety Data Sheet. Protect from sunlight and store in well-ventilated place. Store locked up. Store container tightly closed in well-ventilated place. Dispose in accordance with all applicable regulations.

**Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS**

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>7803-62-5</td>
<td>SILANE</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Section 4 - FIRST AID MEASURES**

Inhalation
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin
If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

Eyes
Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Ingestion
If a large amount is swallowed, get medical attention.

Symptoms: Immediate
respiratory tract irritation, skin irritation, eye irritation, frostbite

Symptoms: Delayed
respiratory tract irritation, dermatitis, conjunctivitis, lung damage

**Section 5 - FIRE FIGHTING MEASURES**

See Section 9 for Flammability Properties

Specific Hazards Arising from the Chemical
Severe fire hazard. May ignite on exposure to air. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back.

Extinguishing Media
- carbon dioxide, regular dry chemical
- Large fires: Use regular foam or flood with fine water spray.

Unsuitable Extinguishing Media
Do not use halogenated extinguishing agents.
Protective Equipment and Precautions for Firefighters

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Fire Fighting Measures

Move container from fire area if it can be done without risk. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuate if fire gets out of control or containers are directly exposed to fire. Evacuation radius: 500 meters (1/3 mile). Consider downwind evacuation if material is leaking.

Hazardous Combustion Products

Combustion: silicon, hydrogen

** **Section 6 - ACCIDENTAL RELEASE MEASURES** **

Personal Precautions

Wear personal protective clothing and equipment, see Section 8.

Environmental Precautions

Avoid release to the environment.

Methods for Containment

Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Keep unnecessary people away, isolate hazard area and deny entry.

Cleanup Methods

Avoid heat, flames, sparks and other sources of ignition. Reduce vapors with water spray. Remove sources of ignition. Ventilate closed spaces before entering. Damaged cylinders should be handled only by specialists.

** **Section 7 - HANDLING AND STORAGE** **

Handling Procedures

Wash thoroughly after handling.

Storage Procedures


Incompatibilities metal salts, bases, halogens, oxidizing materials

** **Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION** **

Component Exposure Limits

SILANE (7803-62-5)

ACGIH: 5 ppm TWA
OSHA (Vacated): 5 ppm TWA; 7 mg/m3 TWA
NIOSH: 5 ppm TWA; 7 mg/m3 TWA

Component Biological Limit Values

There are no biological limit values for any of this product's components.
Engineering Controls
Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eyes/Face
Wear helmet with full face shield and fire-proof hood to prevent any possibility of burns if in contact with this substance.

Protective Clothing
Wear appropriate chemical resistant clothing.

Glove Recommendations
Wear fire-resistant gloves.

Respiratory Protection
Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum.
Consider warning properties before use.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Physical State:</th>
<th>Gas</th>
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<tbody>
<tr>
<td>Color:</td>
<td>colorless</td>
</tr>
<tr>
<td>Odor:</td>
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</tr>
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<td>pH:</td>
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<td>Boiling Point:</td>
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<td>LEL:</td>
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<td>Vapor Pressure:</td>
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<td>Density:</td>
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<td>Viscosity:</td>
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<td>Appearance:</td>
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<td>Flash Point:</td>
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<tr>
<td>UEL:</td>
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<tr>
<td>Vapor Density (air = 1):</td>
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<tr>
<td>Water Solubility:</td>
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<tr>
<td>Auto Ignition:</td>
<td>Not available</td>
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<tr>
<td>Volatility:</td>
<td>100 %</td>
</tr>
<tr>
<td>Molecular Formula:</td>
<td>SI-H4</td>
</tr>
</tbody>
</table>

Solvent Solubility
Insoluble: ethanol, benzene, ether, chloroform, silicochloroform, silicon tetrachloride

**Section 10 - STABILITY AND REACTIVITY**

Chemical Stability
May ignite on exposure to air.
Conditions to Avoid
Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.

Possibility of Hazardous Reactions
Will not polymerize.

Incompatible Materials
- metal salts, bases, halogens, oxidizing materials

Hazardous Decomposition
Combustion: silicon, hydrogen

**Section 11 - TOXICOLOGICAL INFORMATION**

Acute and Chronic Toxicity

Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and the following selected endpoints are published:
SILANE (7803-62-5)
Inhalation LC50 Rat 9600 ppm 4 h

RTECS Acute Toxicity (selected)
The components of this material have been reviewed, and RTECS publishes the following endpoints:
SILANE (7803-62-5)
Inhalation: 9600 ppm/4 hour Inhalation Rat LC50

Acute Toxicity Level
SILANE (7803-62-5)
Slightly Toxic: inhalation

Immediate Effects
respiratory tract irritation, skin irritation, eye irritation, frostbite

Delayed Effects
respiratory tract irritation, dermatitis, conjunctivitis, lung damage

Irritation/Corrosivity Data
No animal testing data available for skin or eyes.

RTECS Irritation
The components of this material have been reviewed and RTECS publishes no data as of the date on this document.

Local Effects
SILANE (7803-62-5)
Irritant: inhalation, skin, eye

Respiratory Sensitizer
No data available.

Dermal Sensitizer
No data available.

Carcinogenicity
Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, NTP, OSHA or DFG.

Mutagenic Data
Both negative and positive results found with E. coli and S. typhimurium, with and without activation; no human data available.

RTECS Mutagenic
The components of this material have been reviewed, and RTECS publishes data for one or more components.
Reproductive Effects Data
No data available.

RTECS Tumorigenic
The components of this material have been reviewed, and RTECS publishes data for one or more components.

Specific Target Organ Toxicity - Single Exposure
respiratory system

Specific Target Organ Toxicity - Repeated Exposure
respiratory system, lungs

Aspiration Hazard
Not applicable.

Medical Conditions Aggravated by Exposure
respiratory disorders

Component Analysis - Aquatic Toxicity
No LOLI ecotoxicity data are available for this product's components.

Persistence and Degradability
No data available.

Bioaccumulative Potential
No data available.

Mobility in Environmental Media
No data available.

Disposal Methods
Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

Component Waste Numbers
The U.S. EPA has not published waste numbers for this product's components.

US DOT Information
Shipping Name: Silane
UN/NA #: UN2203 Hazard Class: 2.1
Required Label(s): 2.1

IMDG Information
Shipping Name: Silane
UN #: UN2203 Hazard Class: 2.1

Component Analysis - U.S. Federal Regulations
None of this product's components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA 311/312 Hazardous Categories
Acute Health: Yes Chronic Health: No Fire: Yes Pressure: Yes Reactive: Yes
U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>CA</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
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</thead>
<tbody>
<tr>
<td>SILANE</td>
<td>7803-62-5</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Not regulated under California Proposition 65

Component Analysis - Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>US</th>
<th>CA</th>
<th>EU</th>
<th>AU</th>
<th>PH</th>
<th>JP</th>
<th>KR</th>
<th>CN</th>
<th>NZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>SILANE</td>
<td>7803-62-5</td>
<td>Yes</td>
<td>DSL</td>
<td>EIN</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

** **Section 16 - OTHER INFORMATION** **

**NFPA Ratings:** Health: 2 Fire: 4 Reactivity: 3

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

**Key / Legend**

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

**Other Information**

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End of Sheet MAT20590