Precautionary Statement(s)
Do not breathe gas. Keep away from heat, sparks, open flame, and hot surfaces - No smoking. Use only outdoors or in a well-ventilated area. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. If skin irritation occurs: Get medical advice/attention. Get medical advice/attention if you feel unwell. Store in a well-ventilated place. Keep container tightly closed. Store locked up. Protect from sunlight. 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>7440-59-7</td>
<td>Helium</td>
<td>95</td>
</tr>
<tr>
<td>7803-62-5</td>
<td>Silane</td>
<td>5</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
frostbite, respiratory tract irritation, skin irritation, eye irritation

Symptoms: Delayed
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
Helium (7440-59-7)
ACGIH: Simple asphyxiating (See Appendix F: Minimal Oxygen Content)

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.
Safety Data Sheet

Material Name: 5% SILANE IN HELIUM, GAS MIX  
SDS ID: 00233171

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.

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**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

<table>
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<tr>
<th>Physical State: Gas</th>
<th>Appearance: Not available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color: colorless</td>
<td>Physical Form: gas</td>
</tr>
<tr>
<td>Odor: unpleasant odor</td>
<td>Odor Threshold: Not available</td>
</tr>
<tr>
<td>pH: Not available</td>
<td>Melting/Freezing Point: Not available</td>
</tr>
<tr>
<td>Boiling Point: Not available</td>
<td>Flash Point: flammable gas (SILANE)</td>
</tr>
<tr>
<td>Decomposition: Not available</td>
<td>Evaporation Rate: Not available</td>
</tr>
<tr>
<td>LEL: 1 % (SILANE)</td>
<td>UEL: 100 % (SILANE)</td>
</tr>
<tr>
<td>Vapor Pressure: Not available</td>
<td>Vapor Density (air = 1): Not available</td>
</tr>
<tr>
<td>Water Solubility: Not available</td>
<td>Log KOW: Not available</td>
</tr>
<tr>
<td>Auto Ignition: Not available</td>
<td>Viscosity: Not available</td>
</tr>
</tbody>
</table>

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**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

Product Toxicity Data
See component data.

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

Delayed Effects
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
No 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.

Tumorigenic Data
No data available.
**Section 12 - ECOLOGICAL INFORMATION**

**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.

**Section 13 - DISPOSAL CONSIDERATIONS**

**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.

**Section 14 - TRANSPORT INFORMATION**

**US DOT Information**
Shipping Name: Compressed gas, flammable, n.o.s. (Contains: Silane)
UN/NA #: UN1954  Hazard Class: 2.1
Required Label(s): 2.1

**IMDG Information**
Shipping Name: Compressed gas, flammable, n.o.s. (Contains: Silane)
UN #: UN1954  Hazard Class: 2.1

**Section 15 - REGULATORY INFORMATION**

**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
Safety Data Sheet

Material Name: 5% SILANE IN HELIUM, GAS MIX  
SDS ID: 00233171

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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<tbody>
<tr>
<td>Helium</td>
<td>7440-59-7</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<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>
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<th>PH</th>
<th>JP</th>
<th>KR</th>
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<tbody>
<tr>
<td>Helium</td>
<td>7440-59-7</td>
<td>Yes</td>
<td>DSL</td>
<td>EIN</td>
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<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<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 - Farenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; 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 00233171