**Section 1 - IDENTIFICATION**

**Manufacturer Information**
MATHESON TRI-GAS, INC.
150 Allen Road, Suite 302
Basking Ridge, NJ  07920

General Information: 1-800-416-2505

Emergency #: 1-800-424-9300 (CHEMTREC)

Outside the US: 703-527-3887 (Call collect)

**Product Identifier:** 1% Phosphine in Helium, Gas Mix

**Product Use**
industrial

**Restrictions on Use**
None known.

**Section 2 - HAZARDS IDENTIFICATION**

**GHS Classification**
- Gas under pressure, Compressed gas
- Acute Toxicity (Inhalation), Category 1 (99% unknown)
- Specific Target Organ Toxicity - Single Exposure, Category 1 (cardiovascular system, digestive tract, liver, nervous system, and respiratory system)
- Specific Target Organ Toxicity - Repeated Exposure, Category 1 (nervous system and respiratory system)

**GHS LABEL ELEMENTS**

**Signal Word**
DANGER

**Hazard Statement(s)**
- Contains gas under pressure; may explode if heated
- Fatal if inhaled
- Causes damage to cardiovascular system, digestive tract, liver, nervous system, and respiratory system.
- Causes damage to nervous system and respiratory system through prolonged or repeated exposure.

**Precautionary Statement(s)**

**Prevention**
- Do not breathe gas. Use only outdoors or in a well-ventilated area. Wear respiratory protection. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product.

**Response**
- IF exposed: Call a POISON CENTER or doctor/physician. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. Specific treatment is urgent, see first aid section of Safety Data Sheet.
Storage
Store in a well-ventilated place. Protect from sunlight. Keep container tightly closed. Store locked up.

Disposal
Dispose of in accordance with applications with applicable regulations.

Other Hazards which do not Result in Classification
May cause asphyxia. May cause frostbite upon sudden release of compressed gas.

** *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>99</td>
</tr>
<tr>
<td>7803-51-2</td>
<td>Phosphine</td>
<td>1</td>
</tr>
</tbody>
</table>

** *Section 4 - FIRST AID MEASURES* * *

Inhalation
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. 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
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, suffocation, respiratory tract irritation, central nervous system depression, cardiovascular system damage, digestive tract damage, liver damage, nervous system damage, respiratory system damage

Symptoms: Delayed
nervous system damage, respiratory system damage

** *Section 5 - FIRE FIGHTING MEASURES* * *

See Section 9 for Flammability Properties

Specific Hazards Arising from the Chemical
Negligible fire hazard. Containers may rupture or explode if exposed to heat.

Extinguishing Media
regular dry chemical, carbon dioxide

Unsuitable Extinguishing Media
None known.

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. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. 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: Evacuation radius: 800 meters (1/2 mile).

Hazardous Combustion Products
**Combustion:** oxides of phosphorus, phosphorus

**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**
Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.

**Cleanup Methods**
Stop leak if possible without personal risk.

**Section 7 - HANDLING AND STORAGE**

**Handling Procedures**
Wash thoroughly after handling.

**Storage Procedures**
Store and handle in accordance with all current regulations and standards. Avoid direct sunlight. Store in a tightly closed container. Store in a well-ventilated place. Store locked up. May ignite on exposure to air. See original container for storage recommendations. Keep separated from incompatible substances.

*Incompatibilities* acids, halo carbons, halogens, nitric acid, oxidizing materials

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

**Component Exposure Limits**

<table>
<thead>
<tr>
<th>Component</th>
<th>Helium (7440-59-7)</th>
<th>Phosphine (7803-51-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>Simple asphyxiant (See Appendix F: Minimal Oxygen Content)</td>
<td></td>
</tr>
<tr>
<td>Helium</td>
<td>ACGIH: 0.3 ppm TWA</td>
<td>1 ppm STEL</td>
</tr>
<tr>
<td></td>
<td>Europe: 0.1 ppm TWA; 0.14 mg/m3 TWA</td>
<td>0.2 ppm STEL; 0.28 mg/m3 STEL</td>
</tr>
<tr>
<td>OSHA (Final): 0.3 ppm TWA; 0.4 mg/m3 TWA</td>
<td>OSHA (Vacated): 0.3 ppm TWA; 0.4 mg/m3 TWA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NIOSH: 0.3 ppm TWA; 0.4 mg/m3 TWA</td>
<td>1 ppm STEL; 1 mg/m3 STEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 ppm STEL; 1 mg/m3 STEL</td>
</tr>
</tbody>
</table>

**Component Biological Limit Values**
There are no biological limit values for any of this product's components.

**Engineering Controls**
Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT**

**Eyes/Face**
Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

**Protective Clothing**
For the gas: Wear appropriate chemical resistant clothing. For the liquid: Wear appropriate protective, cold insulating clothing.
Glove Recommendations
For the gas: Wear appropriate chemical resistant gloves. For the liquid: Wear insulated gloves.

Respiratory Protection
The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
3 ppm
Any supplied-air respirator.
7.5 ppm
Any supplied-air respirator operated in a continuous-flow mode.
15 ppm
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.
50 ppm
Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.
Emergency or planned entry into unknown concentrations or IDLH conditions -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
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.
Escape -
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.
Any appropriate escape-type, self-contained breathing apparatus.

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>
<th>Appearance:</th>
<th>Colorless gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td>colorless</td>
<td>Physical Form:</td>
<td>gas</td>
</tr>
<tr>
<td>Odor:</td>
<td>fishy odor, pungent odor</td>
<td>Odor Threshold:</td>
<td>Not available</td>
</tr>
<tr>
<td>pH:</td>
<td>Not available</td>
<td>Melting/Freezing Point:</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling Point:</td>
<td>Not available</td>
<td>Flash Point:</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Decomposition:</td>
<td>Not available</td>
<td>Evaporation Rate:</td>
<td>Not available</td>
</tr>
<tr>
<td>LEL:</td>
<td>1 % (phosphine)</td>
<td>UEL:</td>
<td>98 % (phosphine)</td>
</tr>
<tr>
<td>Vapor Pressure:</td>
<td>Not available</td>
<td>Vapor Density (air = 1):</td>
<td>Not available</td>
</tr>
<tr>
<td>Specific Gravity (water=1):</td>
<td>Not available</td>
<td>Water Solubility:</td>
<td>Not available</td>
</tr>
<tr>
<td>Log KOW:</td>
<td>Not available</td>
<td>Coeff. Water/Oil Dist:</td>
<td>Not available</td>
</tr>
<tr>
<td>Auto Ignition:</td>
<td>100 °C (phosphine)</td>
<td>Viscosity:</td>
<td>Not available</td>
</tr>
</tbody>
</table>
**Section 10 - STABILITY AND REACTIVITY**

**Chemical Stability**
May ignite on exposure to air. Avoid contact with temperatures above 150 C. May decompose violently.

**Conditions to Avoid**
Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat.

**Possibility of Hazardous Reactions**
Will not polymerize.

**Incompatible Materials**
acids, halo carbons, halogens, nitric acid, oxidizing materials

**Hazardous Decomposition**
Combustion: oxides of phosphorus, phosphorus

**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:

**Phosphine (7803-51-2)**
Inhalation LC50 Rat 11 ppm 4 h

**RTECS Acute Toxicity (selected)**
The components of this material have been reviewed, and RTECS publishes the following endpoints:

**Phosphine (7803-51-2)**
Inhalation: 11 ppm/4 hour Inhalation Rat LC50

**Acute Toxicity Level**
**Phosphine (7803-51-2)**

Highly Toxic: inhalation

**Immediate Effects**
frostbite, suffocation, respiratory tract irritation, central nervous system depression, cardiovascular system damage, digestive tract damage, liver damage, nervous system damage, respiratory system damage

**Delayed Effects**
nervous system damage, respiratory system 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**
**Phosphine (7803-51-2)**

Irritant: inhalation

**Target Organs**
**Phosphine (7803-51-2)**
central nervous system

**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 for the mixture.

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 for the mixture.

Tumorigenic Data
   No data available for the mixture.

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
   central nervous system, respiratory system, cardiovascular system, digestive tract, liver, nervous system

Specific Target Organ Toxicity - Repeated Exposure
   nervous system, respiratory system

Aspiration Hazard
   Not applicable.

Medical Conditions Aggravated by Exposure
   respiratory disorders, kidney disorders, liver disorders, nervous system disorders, skin disorders

** **Section 12 - ECOLOGICAL INFORMATION** **

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

Persistence and Degradability
   No data available for the mixture.

Bioaccumulative Potential
   No data available for the mixture.

Mobility in Environmental Media
   No data available for the mixture.

** **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): D003.

Component Waste Numbers
   Phosphine (7803-51-2)
      RCRA:  waste number P096

** **Section 14 - TRANSPORT INFORMATION** **

US DOT Information
   Shipping Name: Compressed gas, toxic, n.o.s. (Contains: Phosphine, Helium)
   UN/NA #: UN1955  Hazard Class: 2.3
   Required Label(s): 2.3
   Additional Info.: Inhalation Hazard Zone C
**Safety Data Sheet**

**Material Name:** 1% Phosphine in Helium, Gas Mix

**IMDG Information**

**Shipping Name:** Compressed gas, toxic, n.o.s. (Contains: Phosphine, Helium)

**UN #:** UN1955  **Hazard Class:** 2.3

**Required Label(s):** 2.3, +

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**Section 15 - REGULATORY INFORMATION**

**Component Analysis**

**U.S. Federal Regulations**

This material contains one or more of the following chemicals required to be identified under SARA Section 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

**Phosphine (7803-51-2)**

- **SARA 302:** 500 lb TPQ
- **SARA 304:** 100 lb EPCRA RQ
- **SARA 313:** 1.0% de minimis concentration
- **CERCLA:** 100 lb final RQ; 45.4 kg final RQ
- **OSHA (safety):** 100 lb TQ

**SARA 311/312 Hazardous Categories**

- **Acute Health:** Yes  
- **Chronic Health:** Yes  
- **Fire:** No  
- **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>
</tr>
</thead>
<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>Phosphine</td>
<td>7803-51-2</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

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**Section 16 - OTHER INFORMATION**

**NFPA Ratings:**

- **Health:** 4  
- **Fire:** 0  
- **Reactivity:** 2

**Hazard Scale:** 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
Safety Data Sheet

Material Name: 1% Phosphine in Helium, Gas Mix

SDS ID: 00244264

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 00244264