Safety Data Sheet

SDS ID# 3005

Section 1. IDENTIFICATION

1.1. Product identifier

Product form : Mixture

Product name : Hydrogen (0.0001%-2.0%) in Air (Oxygen 20.9% bal. Nitrogen)

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

Product use : Calibration gas/Bumptest gas/Function test gas

1.3. Details of the supplier of the safety data sheet

Intermountain Specialty Gases
520 N. Kings Road
Nampa, ID 83687
Telephone 1-208-466-9425 or Toll free 1-800-552-5003
Fax 1-208-466-9144
www.isgases.com

1.4. Emergency telephone number

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

Section 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification : GASES UNDER PRESSURE - Compressed gas

2.2. Label elements

Hazard pictograms

Signal word : WARNING

Hazard statements : H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
: OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.
: OSHA - PG01 - DO NOT REMOVE THIS PRODUCT LABEL

Precautionary statements
Section 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product Identifier</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>(CAS No) 7727-37-9</td>
<td>74.5 - 80.4999</td>
</tr>
<tr>
<td>Oxygen</td>
<td>(CAS No) 7782-44-7</td>
<td>19.5 - 23.5</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>(CAS No) 1333-74-0</td>
<td>0.0001 - 2.0</td>
</tr>
</tbody>
</table>

Section 4. FIRST AID MEASURES

4.1. Description of first aid measures

General : IF exposed or concerned: Get medical advice/attention.

Inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If breathing has stopped, give artificial respiration or oxygen by trained personnel. If victim feels unwell, seek medical advice.

Skin contact : Immediately flush with copious amount of water for at least 15 minutes.

Eye contact : Immediately flush with copious amount of water for at least 15 minutes.

Ingestion : Ingestion is not considered a potential route of exposure, refer to the inhalation section.

4.2. Most important symptoms/effects, acute and delayed

Acute
Hydrogen (0.0001%-2.0%) in Air (Oxygen 20.9% bal. Nitrogen)

Inhalation: May displace oxygen and cause rapid suffocation.
Skin contact: Contact with rapidly expanding gas may cause burns or frostbite.
Eye contact: Contact with rapidly expanding gas may cause burns or frostbite.
Ingestion: Ingestion is not considered a potential route of exposure, refer to the inhalation section.
Frostbite: Thaw frosted parts with lukewarm water. Do not rub affected areas. Get immediate medical advice/attention.

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.

Section 5. FIREFIGHTING MEASURES

5.1. Extinguishing media
Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire.
Unsuitable extinguishing media: None known

5.2. Special hazards arising from the substance or mixture
Fire hazard: The product is not flammable
Explosion hazard: Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.
Reactivity: None known.

5.3. Advice for fire-fighters
Firefighting instructions: In case of fire: Evacuate all personnel from the danger area. Stop the leak and flow of gas before extinguishing fire, if safe to do so. If this is not possible, withdraw from area and allow fire to burn. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Let the fire burn. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Exercise caution when fighting any chemical fire.
Protection during firefighting: Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus, SCBA) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection.

4.3. Indication of any immediate medical attention and special treatment needed
If victim feels unwell, seek medical advice. If breathing is difficult, give artificial respiration or oxygen by trained personnel.

Symptoms/injuries upon intravenous administration: Not known
Chronic symptoms: Adverse effects not expected from this product.
Delayed: Adverse effects not expected from this product.

Section 4. FIRST AID MEASURES

Eye contact: Contact with rapidly expanding gas may cause burns or frostbite.
Ingestion: Ingestion is not considered a potential route of exposure, refer to the inhalation section.
Frostbite: Thaw frosted parts with lukewarm water. Do not rub affected areas. Get immediate medical advice/attention.

Inhalation: May displace oxygen and cause rapid suffocation.
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Frostbite: Thaw frosted parts with lukewarm water. Do not rub affected areas. Get immediate medical advice/attention.
**6.1.12. 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. See information above "For non-emergency personnel".

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

**For containment**: Immediately contact emergency personnel. Try to stop gas leak if safe to do so.

**Methods for cleaning up**: Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

### Section 7. HANDLING AND STORAGE

#### 7.1. Precautions for safe handling

**Precautions for safety handling**: Pressurized container: Do not pierce or burn, even after use. Use equipment rated for cylinder pressure. Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Protect cylinders from physical damage; do not drag, roll, slide, or drop.

**Hygiene measures**: Do not eat, drink or smoke when using this product.

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

**Technical measures**: None known.

**Storage conditions**: Do not expose to temperatures exceeding 52°C (125°F). Store locked up. Keep containers closed when not in use. Protect cylinder from physical damage. Store and use away from heat, sparks, open flame or any other ignition source. Store in well ventilated area.

**Incompatible products**: None known.

**Incompatible materials**: None known.

### Section 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Nitrogen (7727-37-9)

<table>
<thead>
<tr>
<th>OSHA PEL</th>
<th>Cal/OSHA PEL</th>
<th>NIOSH REL</th>
<th>ACGIH 2015 TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppm</td>
<td>ppm</td>
<td>ppm</td>
<td>ppm</td>
</tr>
<tr>
<td>mg/m³</td>
<td>mg/m³</td>
<td>mg/m³</td>
<td>mg/m³</td>
</tr>
<tr>
<td>8-hour TWA</td>
<td>(ST) STEL</td>
<td>up to 10-hour TWA</td>
<td>(ST) STEL</td>
</tr>
<tr>
<td>(C) Ceiling</td>
<td>(C) Ceiling</td>
<td>(C) Ceiling</td>
<td>(C) Ceiling</td>
</tr>
<tr>
<td>Not established</td>
<td>Not established</td>
<td>Not established</td>
<td>Simple asphyxiant</td>
</tr>
</tbody>
</table>

#### Oxygen (7782-44-7)

<table>
<thead>
<tr>
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<th>Cal/OSHA PEL</th>
<th>NIOSH REL</th>
<th>ACGIH 2015 TLV</th>
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<tr>
<td>ppm</td>
<td>ppm</td>
<td>ppm</td>
<td>ppm</td>
</tr>
<tr>
<td>mg/m³</td>
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<tr>
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</tr>
<tr>
<td>(C) Ceiling</td>
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There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.

### Hydrogen (1333-74-0)

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<th>NIOSH REL</th>
<th>ACGIH 2015 TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppm</td>
<td>mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-hour TWA (ST) STEL (C) Ceiling</td>
<td>(as of 4/26/13)</td>
<td>(as of 4/26/13)</td>
<td>8-hour TWA (ST) STEL (C) Ceiling</td>
</tr>
<tr>
<td>up to 10-hour TWA (ST) STEL (C) Ceiling</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.

### 8.2. Appropriate engineering controls

**Engineering measures/controls**: Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly check for leakages. Ensure exposure is below occupational exposure limits. Oxygen detectors should be used when asphyxiating gases may be released. Consider work permit system e.g. for maintenance activities.

### 8.3. Individual protection measures


**Skin and body protection**: Wear suitable protective clothing, e.g.-Lab coats, coveralls or flame resistant clothing.

**Respiratory protection**: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

**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. Exposure controls

- **Appearance**: Clear, colorless gas.
- **Physical state**: Gas
- **Color**: Colorless
- **Odor**: Odorless
- **Odor threshold**: No data available
- **pH**: No data available
- **Freezing point**: No data available
- **Flash point**: No data available
- **Evaporation rate**: No data available
- **Flammability (solid, gas)**: Not Flammable - not combustible
- **Upper flammability**: Not Flammable - not combustible
Section 10. STABILITY AND REACTIVITY

10.1. Reactivity
No reactivity hazard other than the effects described below.

10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of hazardous reactions
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

10.4. Conditions to avoid
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

10.5. Incompatible materials
None known

10.6. Hazardous decomposition products
None known

Section 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Nitrogen (7727-37-9)
LC50 inhalation rat (ppm) 410,000 ppm/4h

Oxygen (7782-44-7)
LC50 inhalation rat (ppm) 400,000 ppm/4h
11.1. Information on routes of exposure

- **Inhalation**: May displace oxygen and cause rapid suffocation.
- **Skin contact**: Adverse effects not expected from this product.
- **Eye contact**: Adverse effects not expected from this product.
- **Ingestion**: Ingestion is not considered a potential route of exposure.

11.2. Symptoms related to physical, chemical and toxicological characteristics

**Symptoms**

Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<=18%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

11.3. Delayed and immediate effects

- **Skin corrosion/irritation**: Contact with rapidly expanding gas may cause burns or frostbite.
- **Serious eye damage/irritation**: Contact with rapidly expanding gas may cause burns or frostbite.
- **Respiratory or skin sensitization**: Not classified.
- **Germ cell mutagenicity**: Not classified.
- **Carcinogenicity**: Not classified.
- **Reproductive toxicity**: Suspected of damaging fertility. Suspected of damaging the unborn child.
- **Developmental Toxicity**: Not classified.
- **Specific target organ toxicity (single exposure)**: Not classified.
- **Specific target organ toxicity (repeated exposure)**: Not classified.
- **Aspiration hazard**: Not classified.

Not applicable for gases and gas-mixtures.

11.4. Carcinogenic effects

The components of this material are not found on the following lists: FEDERAL OSHA Z LIST, NTP AND IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

**Section 12. ECOLOGICAL INFORMATION**

12.1. Aquatic Toxicity

**Ecology - general**: No ecological damage caused by this product.

12.2. Persistence and degradability
Section 13. DISPOSAL CONSIDERATIONS

13.1. Disposal methods

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

Section 14. TRANSPORATION INFORMATION

<table>
<thead>
<tr>
<th></th>
<th>US DOT</th>
<th>TDG</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN #</td>
<td>UN 1956</td>
<td>UN 1956</td>
<td>UN 1956</td>
<td>UN 1956</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Compressed gas, n.o.s. (Nitrogen, Oxygen) or (Nitrogen, Hydrogen)</td>
<td>Compressed gas, n.o.s. (Nitrogen, Oxygen) or (Nitrogen, Hydrogen)</td>
<td>Compressed gas, n.o.s. (Nitrogen, Oxygen) or (Nitrogen, Hydrogen)</td>
<td>Compressed gas, n.o.s. (Nitrogen, Oxygen) or (Nitrogen, Hydrogen)</td>
</tr>
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<tr>
<td>Packing group</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Section 15. REGULATORY INFORMATION

15.1. US Federal regulations

SARA 311/312 hazard categories

- Acute Health: No
- Chronic Health: No
- Fire: No
- Pressure: Yes
- Reactive: No

SARA Title III Notifications and Information: None known

SARA 311/312: Sudden Release of Pressure Hazard

15.2. US State regulations
Section 16. OTHER INFORMATION

Date of issue/Date of revision: New SDS 3/1/2015
Revision Note: Initial release

Hazardous Material Information System (USA)

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

Health: 1
Fire: 0
Physical hazards: 3

Key/Legend

SARA: Superfund Amendments and Reauthorization Act
OSHA: Occupational Safety and Health Administration
DOT: Department of Transportation
TSCA: Toxic Substance Control Act
NTP: National Toxicology Program
ACGIH: American Conference of Governmental Industrial Hygienists
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit
TLV: Threshold Limit Value
TDG: Transportation of Dangerous Goods
CAS: Chemical Abstracts Service
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act
IATA: International Air Transport Association
IMDG: International Maritime Dangerous Goods
TWA: Time Weighted Average
Prop: Proposition
ATE: Acute Toxicity Estimate
Repr. 2: Reproductive toxicity Category 2

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