Section 1. IDENTIFICATION

1.1. Product identifier

Product form: Mixture

Product name: Nitrogen Dioxide (0.0001%-0.02%) 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
- CGA-HG24 - MAY SUPPORT COMBUSTION
- OSHA - PG01 - DO NOT REMOVE THIS PRODUCT LABEL

Precautionary statements

[General]: Read and follow all Safety Data Sheets (SDS's) before use. Read label before use. Keep out
Nitrogen Dioxide (0.0001%-0.02%) in Air (Oxygen 20.9% bal. Nitrogen)

Prevention
- P202 - Do not handle until all safety precautions have been read and understood
- P271+P403 - Use only outdoors or in a well-ventilated area

Response
- P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.
- P313 - Get medical advice/attention.

Storage
- CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

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

2.3. Other hazards
No additional information available

2.4. Unknown acute toxicity
No data available

Section 3. COMPOSITION/INFORMATION ON INGREDIENTS
3.1. Substance
Not applicable

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product Identifier (CAS No)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>7727-37-9</td>
<td>76.48 - 80.4999</td>
</tr>
<tr>
<td>Oxygen</td>
<td>7782-44-7</td>
<td>19.49 - 23.5</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>10102-44-0</td>
<td>0.0001 - 0.02</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
- Inhalation: Adverse effects not expected from this product.
- 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.
Symptoms/injuries upon intravenous administration: Symptoms of overexposure are dizziness, headache, tiredness, nausea, unconsciousness, cessation of breathing.
Chronic symptoms: Adverse effects not expected from this product.
Delayed: Adverse effects not expected from this product.

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.

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.

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.

6.1.12. For emergency responders
Protective equipment: Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters.
Emergency procedures:
Apparatus) for fire fighters. Equip cleanup crew with proper protection.

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>mg/m³</td>
<td>8-hour TWA (ST) STEL (C) Ceiling</td>
<td>up to 10-hour TWA (ST) STEL (C) Ceiling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8-hour TWA (ST) STEL (C) Ceiling</td>
<td>8-hour TWA (ST) STEL (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>
<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>mg/m³</td>
<td>8-hour TWA (ST) STEL (C) Ceiling</td>
<td>up to 10-hour TWA (ST) STEL (C) Ceiling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8-hour TWA (ST) STEL (C) Ceiling</td>
<td>8-hour TWA (ST) STEL (C) Ceiling</td>
</tr>
</tbody>
</table>

*There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained*
Nitrogen Dioxide (0.0001%-0.02%) in Air (Oxygen 20.9% bal. Nitrogen)

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: Compressed gas
Physical state: Gas
Color: Reddish-brown in air.
Odor: Acrid
Odor threshold: 0.1 - 0.4 ppm
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
Lower flammability: Not Flammable - not combustible
Relative density: No data available

OSHA PEL | Cal/OSHA PEL | NIOSH REL | ACGIH 2015 TLV
---|---|---|---
8-hour TWA | 8-hour TWA | 8-hour TWA
(ST) STEL | (ST) STEL | (ST) STEL
(C) Ceiling | (C) Ceiling | (C) Ceiling
8-hour TWA | 8-hour TWA | 8-hour TWA
(ST) STEL | (ST) STEL | (ST) STEL
(C) Ceiling | (C) Ceiling | (C) Ceiling
(C) 5 ppm | (C) 9 mg/m³ | (C) 1 ppm | (ST) 1 ppm | 0.2 ppm

Nitrogen Dioxide (10102-44-0)

OSHA PEL | Cal/OSHA PEL | NIOSH REL | ACGIH 2015 TLV
---|---|---|---
ppm | mg/m³ | ppm | mg/m³ | ppm | mg/m³ | ppm | mg/m³
8-hour TWA | 8-hour TWA | 8-hour TWA | 8-hour TWA | 8-hour TWA | 8-hour TWA | 8-hour TWA | 8-hour TWA
(ST) STEL | (ST) STEL | (ST) STEL | (ST) STEL | (ST) STEL | (ST) STEL | (ST) STEL | (ST) STEL
(C) Ceiling | (C) Ceiling | (C) Ceiling | (C) Ceiling | (C) Ceiling | (C) Ceiling | (C) Ceiling | (C) Ceiling
(C) 5 ppm | (C) 9 mg/m³ | (C) 1 ppm | (ST) 1 ppm | 0.2 ppm | (ST) 1 ppm | 0.2 ppm | (ST) 1 ppm | 0.2 ppm

Nitrogen Dioxide (0.0001%-0.02%) in Air (Oxygen 20.9% bal. Nitrogen)

above 19.5%.
Nitrogen Dioxide (0.0001%-0.02%) in Air (Oxygen 20.9% bal. Nitrogen)

<table>
<thead>
<tr>
<th>Property</th>
<th>Nitrogen Dioxide</th>
<th>Oxygen</th>
<th>Nitrogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular weight (grams)</td>
<td>46.01</td>
<td>32.00</td>
<td>28.013</td>
</tr>
<tr>
<td>Boiling point</td>
<td>21.1 °C</td>
<td>-182.9 °C</td>
<td>-196 °C</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>14.8 psia@STP</td>
<td>Above critical temperature</td>
<td>Above critical temperature</td>
</tr>
<tr>
<td>Vapor density at 20°C</td>
<td>2.8</td>
<td>1.11</td>
<td>0.97</td>
</tr>
<tr>
<td>Relative gas density</td>
<td>3.4</td>
<td>1.331</td>
<td>1.153</td>
</tr>
<tr>
<td>Critical Temperature</td>
<td>158.2 °C</td>
<td>-118.6 °C</td>
<td>-146.9 °C</td>
</tr>
</tbody>
</table>

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
Sulfur dioxide is not compatible with strong bases, strong oxidizers, powdered metals, metal oxides, interhalogens, metal acetylides, sodium hydride, silver azide, cesium azide, fluorine, zinc, zinc compounds.

10.6. Hazardous decomposition products

Section 11. TOXICOLOGICAL INFORMATION

Acute toxicity

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

Oxygen (7782-44-7)
LC50 inhalation rat (ppm) 400,000 ppm/4 hours
Nitrogen Dioxide (0.0001%-0.02%) in Air (Oxygen 20.9% bal. Nitrogen)

11.1. Information on routes of exposure
- Inhalation: Adverse effects not expected from this product
- Skin contact: Adverse effects not expected from this product
- Eye contact: May cause irritation.
- Ingestion: Ingestion is not considered a potential route of exposure

11.2. Symptoms related to physical, chemical and toxicological characteristics
- Symptoms: No information available

11.3. Delayed and immediate effects
- Skin corrosion/irritation: Contact with rapidly expanding gas may cause burns or frostbite. Concentrations of 10-20 ppm Nitrogen dioxide are mildly irritating to the skin.
- Serious eye damage/irritation: Contact with rapidly expanding gas may cause burns or frostbite. Concentrations of 10-20 ppm Nitrogen dioxide are mildly irritating to the eyes.
- Respiratory or skin sensitization: Not classified
- Germ cell mutagenicity: Not classified
- Carcinogenicity: This product does not contain any carcinogens or potential carcinogens listed by OSHA, IARC or NTP.
- Reproductive toxicity: Not classified
- Developmental Toxicity: Not classified
- Specific target organ toxicity (single exposure): Respiratory system, eyes, skin
- Specific target organ toxicity (repeated exposure): Repeated overexposure to Nitrogen dioxide may cause respiratory problems, fatigue, alteration to taste and smell, dental erosion and gum disease.
- 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
No information available for the product

12.2. Persistence and degradability
No information available for the product

12.3. Bioaccumulative potential
No information available for the product

12.4. Mobility in soil
No information available for the product

LC50 inhalation rat (ppm) 115 ppm / 1 hour
12.5. Other
No information available for the product

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>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>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Compressed gas, n.o.s. (Nitrogen, Oxygen)</td>
<td>Compressed gas, n.o.s. (Nitrogen, Oxygen)</td>
<td>Compressed gas, n.o.s. (Nitrogen, Oxygen)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Packing group</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 : Yes
Chronic Health : No
Fire : No
Pressure : Yes
Reactive : No

SARA Title III Notifications and Information: None known

This product does not contain toxic chemicals subject to reporting requirements of section 313 of the Emergency planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372.

SARA 311/312 Sudden Release of Pressure Hazard

15.2. US State regulations

Nitrogen (007727-37-9)
U.S. - Massachusetts - Right To Know List
U.S. - Minnesota - Right To Know Hazardous Substance List
U.S. - New Jersey - Right To Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right To Know) List
Nitrogen Dioxide (0.0001%-0.02%) in Air (Oxygen 20.9% bal. Nitrogen)

Oxygen (007782-44-7)
- U.S. - Massachusetts - Right To Know List
- U.S. - New Jersey - Right To Know Hazardous Substance List
- U.S. - Pennsylvania - RTK (Right To Know) List

Nitrogen dioxide (10102-44-0)
- U.S. - Massachusetts - Right To Know List
- U.S. - New Jersey - Right To Know Hazardous Substance List
- U.S. - Pennsylvania - RTK (Right To Know) List

Section 16. OTHER INFORMATION

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

Hazardous Material Information System (USA)

<table>
<thead>
<tr>
<th>Hazard Scale</th>
<th>Health</th>
<th>Fire</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 = Minimal/ 1 = Slight/ 2 = Moderate/ 3 = Serious/ 4 = Severe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical hazards</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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