

## Section 1: Product and Company Identification

**Absolute Accuracy**  
4591 S Wayside Dr  
Houston, TX 77087  
(832) 571-2387

Product Code: 373

**Synonyms:**  
**Recommended Use:**  
**Usage Restrictions:**

## Section 2: Hazards Identification



### Warning

**Hazard Classification:**

Gases Under Pressure

**Hazard Statements:**

Contains gas under pressure; may explode if heated

**Precautionary Statements**

**Storage:**

Protect from sunlight.  
Store in well-ventilated place.

## Section 3: Composition/Information on Ingredients

|                         | CAS #      | Concentration |
|-------------------------|------------|---------------|
| <b>Nitrogen Dioxide</b> | 10102-44-0 | PPM 100       |
| <b>Oxygen</b>           | 7782-44-7  | % 20.9        |
| <b>Nitrogen</b>         | 7727-37-9  | balance       |

| Chemical Substance | Chemical Family | Trade Names |
|--------------------|-----------------|-------------|
|--------------------|-----------------|-------------|

|                 | <b>Chemical Substance</b> | <b>Chemical Family</b> | <b>Trade Names</b>  |
|-----------------|---------------------------|------------------------|---|
| <b>Oxygen</b>   | OXYGEN, COMPRESSED GAS    | Inorganic gases        | OXYGEN; DIOXYGEN; MOLECULAR OXYGEN; OXYGEN MOLECULE; PURE OXYGEN; UN 1072; O2   |
| <b>Nitrogen</b> | NITROGEN, COMPRESSED GAS  | Inorganic gases        | DIATOMIC NITROGEN; DINITROGEN; NITROGEN; NITROGEN-14; NITROGEN GAS; UN 1066; N2 |

## Section 4: First Aid Measures

|                         | <b>Skin Contact</b>  | <b>Eye Contact</b>   | <b>Ingestion</b>                                       | <b>Inhalation</b>  | <b>Note to Physicians</b>        |
|-------------------------|--|--|--|--|----------------------------------|
| <b>Nitrogen Dioxide</b> | Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse. | Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention. | Not applicable route of exposure                       | 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. | None                             |
| <b>Oxygen</b>           | None expected  | None expected  | Not likely route of exposure                           | If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.  | None                             |
| <b>Nitrogen</b>         | Wash exposed skin with soap and water.   | Flush eyes with plenty of water.   | If a large amount is swallowed, get medical attention. | 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. | For inhalation, consider oxygen. |

## Section 5: Fire Fighting Measures

|                         | <b>Suitable Extinguishing Media</b>   | <b>Products of Combustion</b>   | <b>Protection of Firefighters</b>  |
|-------------------------|---|---|--|
| <b>Nitrogen Dioxide</b> | Non-flammable gas. Use suitable extinguishing media for surrounding fire.   | Thermal decomposition to give nitric oxide and oxygen when heated above 160 deg C | <ul style="list-style-type: none"> <li>▪ Any self-contained breathing apparatus with a full facepiece. Use a chemical protective suit.</li> <li>▪ Any self-contained breathing apparatus with a full facepiece. Use a chemical protective suit.</li> </ul> |
| <b>Oxygen</b>           | Non-flammable. Use extinguishing agent appropriate for the material which is burning. Use water in large quantities for fires involving oxygen. | Oxides of burning material  | <ul style="list-style-type: none"> <li>▪ Respiratory protection may be needed for frequent or heavy exposure.</li> <li>▪ None</li> </ul>   |
| <b>Nitrogen</b>         | Non-flammable. Use suitable extinguishing media for surrounding fire. Cylinders may rupture or explode if exposed to heat.                      | Non-flammable   | <ul style="list-style-type: none"> <li>▪ Respiratory protection may be needed for frequent or heavy exposure.</li> </ul>   |

## Section 6: Accidental Release Measures

|                         | Personal Precautions   | Environmental Precautions  | Methods for Containment                      |
|-------------------------|--|--|--|
| <b>Nitrogen Dioxide</b> | Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.   | Avoid heat, flames, sparks and other sources of ignition. Keep out of water supplies and sewers. | Not available.                               |
| <b>Oxygen</b>           | Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. | Avoid contact with combustible materials.  | Stop leak if possible without personal risk. |
| <b>Nitrogen</b>         | Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.   | No significant effects from contamination expected.  | Stop leak if possible without personal risk. |

|                         | Methods for Cleanup         | Other Information |
|-------------------------|-----------------------------|-------------------|
| <b>Nitrogen Dioxide</b> | Contact emergency personnel | None.             |
| <b>Oxygen</b>           | Stop leak and ventilate     | None              |
| <b>Nitrogen</b>         | N/A                         | N/A               |

## Section 7: Handling and Storage

|                         | Handling   | Storage   |
|-------------------------|--|---|
| <b>Nitrogen Dioxide</b> | Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125F (52C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods. | Do not get liquid in eyes, on skin, or clothing. Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Open valve slowly. Close cylinder valve after each use; keep closed even when empty. If valve is hard to open, discontinue use and contact your supplier. |
| <b>Oxygen</b>           | Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.  | Keep separated from incompatible substances.  |
| <b>Nitrogen</b>         | Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.  | Keep separated from incompatible substances.  |

## Section 8: Exposure Controls/Personal Protection

|                         | Exposure Guidelines  |
|-------------------------|--|
| <b>Nitrogen Dioxide</b> | TLV-TWA: 3 ppm Short-term Exposure Limits (TLV-STEL): 5ppm           |
| <b>Oxygen</b>           | OXYGEN, COMPRESSED GAS: No occupational exposure limits established. |
| <b>Nitrogen</b>         | NITROGEN, COMPRESSED GAS:<br>NITROGEN: ACGIH (simple asphyxiant)     |

### Engineering Controls

Handle only in fully enclosed systems.

|                         | Eye Protection                                | Skin Protection                               | Respiratory Protection  |
|-------------------------|---|---|---|
| <b>Nitrogen Dioxide</b> | Eye protection not required, but recommended. | Wear appropriate chemical resistant clothing. | Any self-contained breathing apparatus with a full facepiece. Use a chemical protective suit. |
| <b>Oxygen</b>           | Eye protection not required, but recommended. | Protective clothing is not required.          | Respiratory protection may be needed for frequent or heavy exposure.                          |
| <b>Nitrogen</b>         | Eye protection not required, but recommended. | Protective clothing is not required.          | Respiratory protection may be needed for frequent or heavy exposure.                          |

## General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

## Section 9: Physical and Chemical Properties

|                         | Physical State | Appearance | Color                | Change in Appearance | Physical Form | Odor         | Taste     |
|-------------------------|----------------|------------|----------------------|----------------------|---------------|--------------|-----------|
| <b>Nitrogen Dioxide</b> | Gas            | Clear      | Yellow to dark brown | N/A                  | Gas           | Pungent odor | N/A       |
| <b>Oxygen</b>           | Gas            | Clear      | Colorless            | N/A                  | Gas           | Odorless     | Tasteless |
| <b>Nitrogen</b>         | Gas            | Clear      | Colorless            | N/A                  | Gas           | Odorless     | Tasteless |

|                         | Flash Point    | Flammability  | Partition Coefficient | Autoignition Temperature | Upper Explosive Limits | Lower Explosive Limits |
|-------------------------|----------------|---------------|-----------------------|--------------------------|------------------------|------------------------|
| <b>Nitrogen Dioxide</b> | Not applicable | Not available | Not available         | Nonflammable             | Nonflammable           | Nonflammable           |
| <b>Oxygen</b>           | Not flammable  | Not available | Not available         | Nonflammable             | Nonflammable           | Nonflammable           |
| <b>Nitrogen</b>         | Not flammable  | Not available | Not available         | Nonflammable             | Nonflammable           | Nonflammable           |

|                         | Boiling Point   | Freezing Point  | Vapor Pressure    | Vapor Density | Specific Gravity | Water Solubility   | pH  | Odor Threshold  | Evaporation Rate | Viscosity         |
|-------------------------|-----------------|-----------------|-------------------|---------------|------------------|--|---|---|------------------|-------------------|
| <b>Nitrogen Dioxide</b> | 70.1F           | 12 F (-11 C)    | 760 mmHg @ 21.1 C | 1.58 (air=1)  | 1.449            | Reacts to form nitric acid and nitrous acid; nitrous acid then decomposes to nitric acid and nitric oxide. | Not applicable; solutions are very acidic | Reported values vary. 0.11-0.14 ppm (minimum perceptible value) | Not applicable   | 0.42 cP @ 20 C    |
| <b>Oxygen</b>           | -297 F (-183 C) | -360 F (-218 C) | 760 mmHg @ -183 C | 1.1 (Air=1)   | Not applicable   | 3.2% @ 25 C  | Not applicable                            | Not available   | Not applicable   | 0.02075 cP @ 25 C |
| <b>Nitrogen</b>         | -321 F (-196 C) | -346 F (-210 C) | 760 mmHg @ -196 C | 0.967 (Air=1) | Not applicable   | 1.6% @ 20 C  | Not applicable                            | Not available   | Not applicable   | 0.01787 cP @ 27 C |

|                         | Molecular Weight   | Molecular Formula                                  | Density          | Weight per Gallon | Volatility by Volume | Volatility     | Solvent Solubility  |
|-------------------------|--|--|------------------|-------------------|----------------------|----------------|---|
| <b>Nitrogen Dioxide</b> | 46.01 (NO <sub>2</sub> ) or 92.01 (N <sub>2</sub> O <sub>4</sub> ) | N-O <sub>2</sub> or N <sub>2</sub> -O <sub>4</sub> | Not available    | Not available     | 100%                 | Not available  | Soluble: Alkalies, chloroform, carbon disulfide and concentrated nitric and sulfuric acids. |
| <b>Oxygen</b>           | 31.9988  | O <sub>2</sub>                                     | 1.309 g/L @ 25 C | Not available     | Not applicable       | Not applicable | Soluble: Alcohol  |
| <b>Nitrogen</b>         | 28.0134  | N <sub>2</sub>                                     | 1.2506 g/L       | Not available     | 100%                 | 1              | Soluble: Liquid ammonia   |

## Section 10: Stability and Reactivity

|                         | Stability  | Conditions to Avoid  | Incompatible Materials  |
|-------------------------|--|--|---|
| <b>Nitrogen Dioxide</b> | Normally stable. Nitrogen dioxide thermally decomposes to nitric oxide and oxygen when heated above 160 deg C. | Normally stable. Nitrogen dioxide thermally decomposes to nitric oxide and oxygen when heated above 160 deg C. | ACETIC ANHYDRIDE, ALCOHOLS, AMMONIA, BORON TRICHLORIDE, CALCIUM, DIMETHYL SULFOXIDE, FORMALDEHYDE, hydrogen, oxygen, metals                     |
| <b>Oxygen</b>           | Stable at normal temperatures and pressure.  | Stable at normal temperatures and pressure.  | Combustible materials, halo carbons, metals, bases, reducing agents, amines, metal salts, oxidizing materials, alkaline earth and alkali metals |
| <b>Nitrogen</b>         | Stable at normal temperatures and pressure.  | Stable at normal temperatures and pressure.  | Metals, oxidizing materials   |

|                         | Hazardous Decomposition Products                          | Possibility of Hazardous Reactions |
|-------------------------|---|------------------------------------|
| <b>Nitrogen Dioxide</b> | Decomposes in water to form nitric acid and nitrous acid. | Will not polymerize.               |
| <b>Oxygen</b>           | Miscellaneous decomposition products                      | Will not polymerize.               |
| <b>Nitrogen</b>         | Oxides of nitrogen  | Will not polymerize.               |

## Section 11: Toxicology Information

### Acute Effects

|                         | Oral LD50                                     | Dermal LD50     | Inhalation  |
|-------------------------|---|-----------------|---|
| <b>Nitrogen Dioxide</b> | LC50 Inhalation Vapor Rat 790 mg/m3 5 minutes | Not available   | Respiratory tract irritation, cough, dyspnea, headache, nausea, irregular heartbeat, fatigue, pulmonary edema, rapid breathing, increased heart rate, dyspnea, chest pain, bleeding from the lungs or small airways and cyanosis (bluish discoloration of the skin) |
| <b>Oxygen</b>           | Not established                               | Not established | Irritation, changes in body temperature, nausea, difficulty breathing, irregular heartbeat, dizziness, disorientation, hallucinations, mood swings, pain in extremities, tremors, lung congestion, convulsions  |
| <b>Nitrogen</b>         | Not available                                 | Not available   | Nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma  |

|                         | Eye Irritation  | Skin Irritation                               | Sensitization   |
|-------------------------|---|---|---|
| <b>Nitrogen Dioxide</b> | Irritation  | Liquid: burns                                 | Respiratory tract irritation, difficulty breathing, skin irritation, eye irritation |
| <b>Oxygen</b>           | No information on significant adverse effects                   | No information on significant adverse effects | No significant target effects reported.   |
| <b>Nitrogen</b>         | Contact with rapidly expanding gas may cause burns or frostbite | No information on significant adverse effects | Difficulty breathing  |

### Chronic Effects

|                         | Carcinogenicity     | Mutagenicity  | Reproductive Effects           | Developmental Effects |
|-------------------------|---------------------|---------------|--------------------------------|-----------------------|
| <b>Nitrogen Dioxide</b> | May be a carcinogen | Mutagenic     | May have reproductive effects. | No data               |
| <b>Oxygen</b>           | Not known.          | Available.    | Available.                     | No data               |
| <b>Nitrogen</b>         | Not hazardous       | Not available | Not available                  | No data               |

## Section 12: Ecological Information

### Fate and Transport

|  | Eco toxicity | Persistence / Degradability | Bioaccumulation / Accumulation | Mobility in Environment |
|--|--------------|-----------------------------|--------------------------------|-------------------------|
|  |              |                             |                                |                         |

|                         |  |               |                     |               |
|-------------------------|--|---------------|---------------------|---------------|
| <b>Nitrogen Dioxide</b> | Fish toxicity: Acute LC50 19600 ug/L<br>Fresh water Fish - Tench - Tinca tinca - LARVAE - 20 days - 11.18 mm - 11.36 mg 96 hours<br>Invertebrate toxicity: Acute LC50 79450 ug/L Marine water Crustaceans - Redtail prawn - Penaeus penicillatus - 3.58 to 4.75 cm - 0.4 to 0.69 g 48 hours<br>Algal toxicity: Not available<br>Phyto toxicity: Not available<br>Other toxicity: Not available | Not available | Not available       | Not available |
| <b>Oxygen</b>           | Fish toxicity: Not available<br>Invertebrate toxicity: Not available<br>Algal toxicity: Not available<br>Phyto toxicity: Not available<br>Other toxicity: Not available  | Not available | Low bioaccumulation | Not available |
| <b>Nitrogen</b>         | Fish toxicity: Not available<br>Invertebrate toxicity: Not available<br>Algal toxicity: Not available<br>Phyto toxicity: Not available<br>Other toxicity: Not available  | Not available | Not available       | Not available |

## Section 13: Disposal Considerations

|                         |   |
|-------------------------|---|
| <b>Nitrogen Dioxide</b> | Dispose in accordance with all applicable federal and local regulations.  |
| <b>Oxygen</b>           | Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. |
| <b>Nitrogen</b>         | Dispose in accordance with all applicable regulations.  |

## Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

### DOT Information For This Mixture

|                           |   |
|---------------------------|---|
| <b>Shipping Name</b>      | Compressed gas, n.o.s. (Nitrogen, Oxygen) |
| <b>UN Number</b>          | UN1956                                    |
| <b>Hazard Class</b>       | 2.2                                       |
| <b>Hazard Information</b> | Non-Flammable Gas                         |

### Individual Component Information

|                         | Proper Shipping Name                      | ID Number | Hazard Class or Division | Packing Group  | Labeling Requirements | Passenger Aircraft or Railcar Quantity Limitations | Cargo Aircraft Only Quantity Limitations | Additional Shipping Description |
|-------------------------|---|-----------|--------------------------|----------------|-----------------------|--|--|---------------------------------|
| <b>Nitrogen Dioxide</b> | DINITROGEN TETROXIDE; or NITROGEN DIOXIDE | UN1067    | 2.3, 5.1                 | Not applicable | DINITROGEN TETROXIDE  | Forbidden  | Forbidden                                | N/A                             |
| <b>Oxygen</b>           | Oxygen, compressed                        | UN1072    | 2.2                      | Not available  | 2.2; 5.1              | 75 kg or L   | 150 kg                                   | N/A                             |
| <b>Nitrogen</b>         | Nitrogen, compressed                      | UN1066    | 2.2                      | Not applicable | 2.2                   | 75 kg or L   | 150 kg                                   | N/A                             |

### Canadian Transportation of Dangerous Goods

|                         | Shipping Name                             | UN Number | Class    | Packing Group / Risk Group |
|-------------------------|---|-----------|----------|----------------------------|
| <b>Nitrogen Dioxide</b> | DINITROGEN TETROXIDE; or NITROGEN DIOXIDE | UN1067    | 2.3      | Not applicable             |
| <b>Oxygen</b>           | Oxygen, compressed                        | UN1072    | 2.2; 5.1 | Not applicable             |
| <b>Nitrogen</b>         | Nitrogen, compressed                      | UN1066    | 2.2      | Not applicable             |

## Section 15: Regulatory Information

### U.S. Regulations

|                         | CERCLA Sections | SARA 355.30    | SARA 355.40    |
|-------------------------|-----------------|----------------|----------------|
| <b>Nitrogen Dioxide</b> | Not regulated.  | 100 LBS TPQ    | 10 LBS RQ      |
| <b>Oxygen</b>           | Not regulated.  | Not regulated. | Not regulated. |
| <b>Nitrogen</b>         | Not regulated.  | Not regulated. | Not regulated. |

### SARA 370.21

|                         | Acute | Chronic | Fire | Reactive | Sudden Release |
|-------------------------|-------|---------|------|----------|----------------|
| <b>Nitrogen Dioxide</b> | Yes   | No      | Yes  | No       | Yes            |
| <b>Oxygen</b>           | No    | No      | Yes  | No       | Yes            |

|                 |     |    |    |    |     |
|-----------------|-----|----|----|----|-----|
| <b>gen</b>      |     |    |    |    |     |
| <b>Nitrogen</b> | Yes | No | No | No | Yes |

#### SARA 372.65

|                         |                |
|-------------------------|----------------|
| <b>Nitrogen Dioxide</b> | N/A            |
| <b>Oxygen</b>           | Not regulated. |
| <b>Nitrogen</b>         | Not regulated. |

#### OSHA Process Safety

|                         |                |
|-------------------------|----------------|
| <b>Nitrogen Dioxide</b> | Not available  |
| <b>Oxygen</b>           | Not regulated. |
| <b>Nitrogen</b>         | Not regulated. |

#### State Regulations

|                         |                          |
|-------------------------|--------------------------|
|                         | <b>CA Proposition 65</b> |
| <b>Nitrogen Dioxide</b> | Not regulated            |
| <b>Oxygen</b>           | Not regulated.           |
| <b>Nitrogen</b>         | Not regulated.           |

#### Canadian Regulations

|                         |                             |
|-------------------------|-----------------------------|
|                         | <b>WHMIS Classification</b> |
| <b>Nitrogen Dioxide</b> | A, C, D1A, D2B, E           |
| <b>Oxygen</b>           | A,C                         |
| <b>Nitrogen</b>         | A                           |

#### National Inventory Status

|                         | <b>US Inventory (TSCA)</b> | <b>TSCA 12b Export Notification</b> | <b>Canada Inventory (DSL/NDSL)</b> |
|-------------------------|----------------------------|-------------------------------------|------------------------------------|
| <b>Nitrogen Dioxide</b> | Listed on inventory.       | Listed                              | Listed on inventory.               |
| <b>Oxygen</b>           | Listed on inventory.       | Not listed.                         | Not determined.                    |
| <b>Nitrogen</b>         | Listed on inventory.       | Not listed.                         | Listed on inventory.               |

## Section 16: Other Information

|                         |   |
|-------------------------|---|
|                         | <b>NFPA Rating</b>                          |
| <b>Nitrogen Dioxide</b> | HEALTH=3 FIRE=0 REACTIVITY=0 SPECIAL=W-1 OX |
| <b>Oxygen</b>           | HEALTH=0 FIRE=0 REACTIVITY=0 SPECIAL=OX     |
| <b>Nitrogen</b>         | HEALTH=0 FIRE=0 REACTIVITY=0 SPECIAL=SA     |

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard