

Section 1: Product and Company Identification

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

Product Code: 2772

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 |
|------------------------|-----------|---------------|
| Sulfur Dioxide | 7446-09-5 | ppm 10 |
| Carbon Monoxide | 630-08-0 | ppm 50 |
| Nitrogen | 7727-37-9 | balance |

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

Section 4: First Aid Measures

| | Skin Contact | Eye Contact | Ingestion | Inhalation | Note to Physicians |
|------------------------|---|--|--|--|----------------------------------|
| Sulfur Dioxide | Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes. | Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention. | 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. |
| Carbon Monoxide | 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. | 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. |
| Nitrogen | 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

| | Suitable Extinguishing Media | Products of Combustion | Protection of Firefighters |
|------------------------|--|------------------------|--|
| Sulfur Dioxide | Non-flammable. Use suitable extinguishing media for surrounding fire. | None known | <ul style="list-style-type: none"> ▪ Non-flammable ▪ Non-flammable |
| Carbon Monoxide | Carbon dioxide, regular dry chemical Large fires: Use regular foam or flood with fine water spray. | Carbon dioxide | <ul style="list-style-type: none"> ▪ Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. ▪ Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. |
| Nitrogen | 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"> ▪ Respiratory protection may be needed for frequent or heavy exposure. |

Section 6: Accidental Release Measures

| | Personal Precautions | Environmental Precautions | Methods for Containment |
|------------------------|--|--|---|
| Sulfur Dioxide | Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Ventilate closed spaces before entering. Evacuation radius: 150 feet. | Avoid contamination of environment. | Stop leak if possible without personal risk. Reduce vapors with water spray. Do not get water directly on material. |
| Carbon Monoxide | Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. | Avoid heat, flames, sparks and other sources of ignition. Keep out of water supplies and sewers. | Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition. |
| Nitrogen | 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 |
|------------------------|--|---|
| Sulfur Dioxide | Stop leak, evacuate area. Contact emergency personnel. | Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA). |
| Carbon Monoxide | Stop leak, evacuate area. Wear protective equipment. | Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). |
| Nitrogen | N/A | N/A |

Section 7: Handling and Storage

| | Handling | Storage |
|------------------------|--|---|
| Sulfur Dioxide | 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. |
| Carbon Monoxide | Keep separated from incompatible substances. | Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. |
| Nitrogen | 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 |
|-----------------------|---|
| Sulfur Dioxide | SULFUR DIOXIDE: 2 ppm (5 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 5 ppm (13 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993) 5 ppm (13 mg/m3) OSHA TWA 2 ppm ACGIH TWA 5 ppm ACGIH STEL 2 ppm (5 mg/m3) NIOSH recommended TWA 10 hour(s) 5 ppm (13 mg/m3) NIOSH recommended STEL |

| | Exposure Guidelines |
|------------------------|---|
| Carbon Monoxide | CARBON MONOXIDE: 50 ppm (55 mg/m ³) OSHA TWA 35 ppm (40 mg/m ³) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 200 ppm (229 mg/m ³) OSHA ceiling (vacated by 58 FR 35338, June 30, 1993) 25 ppm ACGIH TWA 35 ppm (40 mg/m ³) NIOSH recommended TWA 10 hour(s) 200 ppm (229 mg/m ³) NIOSH recommended ceiling |
| Nitrogen | NITROGEN, COMPRESSED GAS: NITROGEN: ACGIH (simple asphyxiant) |

Engineering Controls

Handle only in fully enclosed systems.

| | Eye Protection | Skin Protection | Respiratory Protection |
|------------------------|---|---|---|
| Sulfur Dioxide | Wear splash resistant safety goggles with a face shield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area. | For the gas: Wear appropriate chemical resistant clothing. For the liquid: Wear appropriate protective, cold insulating clothing. | Non-flammable |
| Carbon Monoxide | Eye protection not required, but recommended. | Protective clothing is not required. | Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. |
| Nitrogen | 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 |
|------------------------|----------------|------------|-----------|----------------------|---------------|-----------------|-----------|
| Sulfur Dioxide | Gas | Clear | Colorless | N/A | Gas | Irritating odor | N/A |
| Carbon Monoxide | Gas | Colorless | Colorless | N/A | Gas | Odorless | Tasteless |
| Nitrogen | Gas | Clear | Colorless | N/A | Gas | Odorless | Tasteless |

| | Flash Point | Flammability | Partition Coefficient | Autoignition Temperature | Upper Explosive Limits | Lower Explosive Limits |
|------------------------|---------------|---------------|--|--------------------------|------------------------|------------------------|
| Sulfur Dioxide | Not flammable | Not available | Not available | Nonflammable | Nonflammable | Nonflammable |
| Carbon Monoxide | Flammable | Not available | 1479.11 (log = 3.17) (estimated from water solubility) | 1128-1202 F (609-650 C) | 0.74 | 12.0-12.5% |
| Nitrogen | 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 |
|-----------------------|---------------|----------------|------------------|---------------|------------------|------------------|--------------------|----------------|----------------------|---------------|
| Sulfur Dioxide | 14 F (-10 C) | -99 F (-73 C) | 2432 mmHg @ 20 C | 2.26 (Air=1) | 1.462 @ -10 C | 22.8% @ 0 C | Acidic in solution | 3-5 ppm | >1 (butyl acetate=1) | Not available |

| | Boiling Point | Freezing Point | Vapor Pressure | Vapor Density | Specific Gravity | Water Solubility | pH | Odor Threshold | Evaporation Rate | Viscosity |
|------------------------|---------------------|-----------------|--|---------------|------------------|------------------|----------------|----------------|------------------|-------------------|
| Carbon Monoxide | -312.7 F (-191.5 C) | -326 F (-199 C) | 760 mmHg @ -191 C gas; cannot be liquefied at room temperature | 0.968 (Air=1) | Not applicable | 2.3% @ 20 C | Not applicable | Not available | Not applicable | 0.01657 cP @ 0 C |
| Nitrogen | -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 |
|------------------------|------------------|-------------------|-----------------|-------------------|----------------------|----------------|--|
| Sulfur Dioxide | 64.06 | S-O2 | 0.169 | Not available | Not available | Not applicable | Soluble: Alcohol, acetic acid, sulfuric acid, ether, chloroform, benzene, sulfuryl chloride, nitrobenzenes, toluene, acetone |
| Carbon Monoxide | 28.01 | C-O | 1.250 g/L @ 0 C | Not available | 100% | Not applicable | Soluble: Alcohol, benzene, acetic acid, ethyl acetate, chloroform, cuprous chloride solutions |
| Nitrogen | 28.0134 | N2 | 1.2506 g/L | Not available | 100% | 1 | Soluble: Liquid ammonia |

Section 10: Stability and Reactivity

| | Stability | Conditions to Avoid | Incompatible Materials |
|------------------------|---|---|---|
| Sulfur Dioxide | Stable at normal temperatures and pressure. | Stable at normal temperatures and pressure. | Combustible materials, metals, bases, oxidizing materials, halogens, metal carbide, metal oxides, peroxides, reducing agents, potassium, sodium, nitril chloride, acrolein, metal oxides, carbide |
| Carbon Monoxide | Stable at normal temperatures and pressure. | Stable at normal temperatures and pressure. | Oxidizing materials, halogens, metal oxides, metals, combustible materials, lithium |
| Nitrogen | Stable at normal temperatures and pressure. | Stable at normal temperatures and pressure. | Metals, oxidizing materials |

| | Hazardous Decomposition Products | Possibility of Hazardous Reactions |
|------------------------|---|------------------------------------|
| Sulfur Dioxide | Forms sulfurous acid solution on reaction with water. | Will not polymerize. |
| Carbon Monoxide | Oxides of carbon | Will not polymerize. |
| Nitrogen | Oxides of nitrogen | Will not polymerize. |

Section 11: Toxicology Information

Acute Effects

| | Oral LD50 | Dermal LD50 | Inhalation |
|------------------------|---|---------------|--|
| Sulfur Dioxide | LC50, 1 hr, rat = 2520 ppm | Not available | Allergic reactions, burns, toxic |
| Carbon Monoxide | LC50 Inhalation Gas. Rat 1807 ppm 4 hours | Not available | Changes in body temperature, changes in blood pressure, nausea, vomiting, chest pain, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, disorientation, hallucinations, pain in extremities, tremors, loss of coordination, hearing loss, visual disturbances, eye damage, suffocation, blood disorders, convulsions, coma |
| Nitrogen | Not available | Not available | Nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma |

| | Eye Irritation | Skin Irritation | Sensitization |
|------------------------|---|---|---|
| Sulfur Dioxide | Corrosive, burns | Corrosive, burns | Acute toxicity, Category 3, inhalation; H331: Toxic if inhaled. Skin corrosion, Category 1B; H314: Causes severe skin burns and eye damage. |
| Carbon Monoxide | No information on significant adverse effects | No information on significant adverse effects | Acute toxicity, Category 3, inhalation; H331: Toxic if inhaled. Reproductive toxicity, Category 1A; H360D: May damage the unborn child. Specific Target Organ Toxicity (repeated exposure), Category 1; H372: Causes damage to organs through prolonged or repeated exposure. |
| Nitrogen | 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 |
|------------------------|--|---------------|----------------------|-----------------------|
| Sulfur Dioxide | IARC: Human Inadequate Evidence, Animal Limited Evidence, Group 3; ACGIH: A4 -Not Classifiable as a Human Carcinogen | Available. | Available. | No data |
| Carbon Monoxide | Not available | Available. | Available. | No data |
| Nitrogen | Not hazardous | Not available | Not available | No data |

Section 12: Ecological Information

Fate and Transport

| | Eco toxicity | Persistence / Degradability | Bioaccumulation / Accumulation | Mobility in Environment |
|------------------------|--|---|--------------------------------|---|
| Sulfur Dioxide | Fish toxicity: 3000 ug/L 0.667-0.833 hour(s) (Avoidance) Atlantic menhaden (<i>Brevoortia tyrannus</i>) Invertebrate toxicity: Not available Algal toxicity: 500 ug/L 6 day(s) (Cellular) Green algae (<i>Rhizoclonium hieroglyphicum</i>) Phyto toxicity: Not available Other toxicity: >=150 ug/L NR hour(s) (Biochemical) Duckweed (<i>Lemna minor</i>) | Not available | Not available | Not available |
| Carbon Monoxide | Fish toxicity: 75000 ug/L 1 day(s) LC100 (Mortality) Orangespotted sunfish (<i>Lepomis humilis</i>) Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available | Relatively non-persistent in the environment. Highly volatile from water. | Not available | Not expected to leach through the soil or the sediment. |
| Nitrogen | Fish toxicity: Not available Invertebrate toxicity: | Not available | Not available | Not available |

| | | | | |
|--|--|--|--|--|
| | Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available | | | |
|--|--|--|--|--|

Section 13: Disposal Considerations

| | |
|------------------------|---|
| Sulfur Dioxide | Dispose in accordance with all applicable regulations. |
| Carbon Monoxide | Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. |
| Nitrogen | Dispose in accordance with all applicable regulations. |

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

DOT Information For This Mixture

| | |
|---------------------------|--|
| Shipping Name | Compressed gas, n.o.s. (Nitrogen, Carbon Monoxide) |
| UN Number | UN1956 |
| Hazard Class | 2.2 |
| Hazard Information | 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 |
|------------------------|-----------------------------|-----------|--------------------------|----------------|-----------------------|--|--|---------------------------------|
| Sulfur Dioxide | Sulfur dioxide | UN1079 | 2.3 | Not applicable | 2.3; 8 | Forbidden | Forbidden | Toxic-Inhalation Hazard Zone C |
| Carbon Monoxide | Carbon monoxide, compressed | UN1016 | 2.3 | Not applicable | 2.3; 2.1 | Forbidden | 25 kg | Toxic-Inhalation Hazard Zone D |
| Nitrogen | 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 |
|-------------|----------------|-----------|--------|----------------------------|
| Sulf | Sulfur dioxide | UN1079 | 2.3; 8 | Not applicable |

| | | | | |
|---|-----------------------------|--------|----------|----------------|
| ur Dio xide | | | | |
| Car bon Mon oxid e | Carbon monoxide, compressed | UN1016 | 2.3; 2.1 | Not applicable |
| Nitr oge n | Nitrogen, compressed | UN1066 | 2.2 | Not applicable |

Section 15: Regulatory Information

U.S. Regulations

| | CERCLA Sections | SARA 355.30 | SARA 355.40 |
|------------------------|------------------------|--------------------|--------------------|
| Sulfur Dioxide | Not regulated. | 500 LBS TPQ | 500 LBS RQ |
| Carbon Monoxide | Not regulated. | Not regulated. | Not regulated. |
| Nitrogen | Not regulated. | Not regulated. | Not regulated. |

SARA 370.21

| | Acute | Chronic | Fire | Reactive | Sudden Release |
|------------------------|--------------|----------------|-------------|-----------------|-----------------------|
| Sulfur Dioxide | Yes | Yes | No | No | Yes |
| Carbon Monoxide | Yes | No | Yes | No | Yes |
| Nitrogen | Yes | No | No | No | Yes |

SARA 372.65

| | |
|------------------------|----------------|
| Sulfur Dioxide | Not regulated. |
| Carbon Monoxide | Not regulated. |
| Nitrogen | Not regulated. |

OSHA Process Safety

| | |
|------------------------|----------------|
| Sulfur Dioxide | 1000 LBS TQ |
| Carbon Monoxide | Not regulated. |
| Nitrogen | Not regulated. |

State Regulations

| | CA Proposition 65 |
|------------------------|---|
| Sulfur Dioxide | WARNING: This product can expose you to chemicals including sulfur dioxide, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov . |
| Carbon Monoxide | WARNING: This product can expose you to chemicals including Carbon Monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov . |
| Nitrogen | Not regulated. |

Canadian Regulations

| | WHMIS Classification |
|------------------------|-----------------------------|
| Sulfur Dioxide | AD1 |
| Carbon Monoxide | A, B1, D1A, D2A. |
| Nitrogen | A |

National Inventory Status

| | US Inventory (TSCA) | TSCA 12b Export Notification | Canada Inventory (DSL/NDL) |
|--|----------------------------|-------------------------------------|-----------------------------------|
| | | | |

| | | | |
|------------------------|----------------------|-------------|----------------------|
| Sulfur Dioxide | Listed on inventory. | Not listed. | Not determined. |
| Carbon Monoxide | Listed on inventory. | Not listed. | Listed on inventory. |
| Nitrogen | Listed on inventory. | Not listed. | Listed on inventory. |

Section 16: Other Information

| | NFPA Rating |
|------------------------|---|
| Sulfur Dioxide | HEALTH=3 FIRE=0 REACTIVITY=0 |
| Carbon Monoxide | HEALTH=2 FIRE=4 REACTIVITY=0 |
| Nitrogen | HEALTH=0 FIRE=0 REACTIVITY=0 SPECIAL=SA |

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