1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE

Containing One or Both of the Following Components in a Nitrogen Balance Gas:
Nitrogen Dioxide: 0.0001-0.022%; Oxygen: 0-23.5%

SYNONYMS: Not Applicable
CHEMICAL FAMILY NAME: Not Applicable
FORMULA: Not Applicable

Document Number: 50022 (Replaces Bacharach MSDS No.99-0154, 99-0190)

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

PRODUCT USE:
Calibration of Monitoring and Research Equipment

SUPPLIER:
BACHARACH, INC.

MSDS RESPONSIBILITY:
CALGAS

ADDRESS:
821 Chesapeake Drive
Cambridge, MD 21613

EMERGENCY PHONE:
CHEMTREC: 1-800-424-8300

BUSINESS PHONE:
1-410-228-6400

General MSDS Information:
1-713/868-0440
Fax on Demand: 1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS #</th>
<th>mole %</th>
<th>EXPOSURE LIMITS IN AIR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACGIH-TLV</td>
<td>OSHA</td>
<td>NIOSH</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>STEL</td>
<td>TWA</td>
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<tr>
<td>Nitrogen Dioxide</td>
<td>10102-44-0</td>
<td>0.0005-0.022%</td>
<td>3</td>
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<td></td>
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</tr>
<tr>
<td>Oxygen</td>
<td>7782-44-7</td>
<td>0-23.5%</td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td>7727-37-9</td>
<td>Balance</td>
<td></td>
</tr>
</tbody>
</table>

NE = Not Established.

See Section 16 for Definitions of Terms Used.

NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This gas mixture has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This gas mixture is colorless, to red-brown, oxidizing gas which is either colorless or has an acrid odor. The Nitrogen Dioxide component of this gas mixture is extremely toxic by inhalation, and symptoms of over-exposure may not become apparent for up to 72 hours. Over-exposures to this gas mixture may result in severe irritation and burns of eyes, skin, mucous membranes, and any other exposed tissue. If high concentrations of Nitrogen Dioxide are provided to give complete information on effects observed in humans after over-exposures have occurred.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this gas mixture is by inhalation.

INHALATION: Due to the small size of an individual cylinder of this gas mixture, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. If this gas mixture is released in a small, poorly-ventilated area (i.e. an enclosed or confined space), there is a potential for inhalation over-exposures to Nitrogen Dioxide. Such over-exposure may result in serious health consequences, especially if the Nitrogen Dioxide concentration is over 100 ppm. There are no specific exposure limits for Nitrogen Dioxide in air. Although released of this gas mixture may produce oxygen-deficient atmospheres (especially in confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

INHALATION (continued): Typical symptoms of over-exposure to Nitrogen Dioxide are as follows:

NITROGEN DIOXIDE

CONCENTRATION OBSERVED EFFECT

25 ppm for 8 hours
25 ppm for 8 hours
100 - 150 ppm
200 - 700 ppm

Delayed (5 - 72 hours) pulmonary irritation
Delayed (5-48 hours) pulmonary edema and for 30 - 60 minutes symptoms of pulmonary dysfunction.
Severe pulmonary damage may result after a delay any exposure of 5-8 hours.

NOTE: This gas mixture contains a maximum of 220 ppm Nitrogen Dioxide. Data pertinent to higher concentrations of Nitrogen Dioxide are provided to complete give information on effects observed in humans after over-exposure.

Additionally, if mixtures of this gas mixture contain less than 19.5% Oxygen and are released in a small, poorly-ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The effects associated with various levels of oxygen are listed on the following page.
3. HAZARD IDENTIFICATION (Continued)

CONTACT WITH SKIN or EYES: Due to the presence of Nitrogen Dioxide, this gas mixture may irritate the skin if exposure is for prolonged periods, especially in a moist environment. Symptoms of skin over-exposure may include scratching, pain, and redness. If this gas mixture contaminates the eyes, severe injury and swelling of the eye tissue may occur. Contact with rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after such contact can quickly subside.

SKIN ABSORPTION: Skin absorption is a significant route of exposure for Nitrogen Dioxide following prolonged, low-level exposure. Symptoms of over-exposure would include the described symptoms for “Contact with Skin and Eyes.”

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms

Over-exposure to this gas mixture may cause the following health effects:

ACUTE: Due to the small size of the individual cylinder of this gas mixture, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. Due to the presence of Nitrogen Dioxide, this gas mixture is potentially damaging to the respiratory system. Over-exposures may result in severe irritation and burns of eyes, skin, mucous membranes, and any other exposed tissue. If high concentrations of Nitrogen Dioxide (> 100 ppm) are inhaled, delayed pulmonary damage and breathing difficulty may occur. Contact with rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

CHRONIC: Due to the presence of Nitrogen Dioxide, prolonged or repeated over-exposures this gas mixture may cause respiratory problems, bronchitis, hacking cough, nasal irritation and discharge, increased fatigue, alteration in the senses of taste and smell. Repeated over exposures to Nitrogen Dioxide can also result in dental erosion and gum disorders.

TARGET ORGANS: ACUTE: Respiratory system, central nervous system, skin, eyes. CHRONIC: Skin, respiratory system, heart, teeth.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS GAS MIXTURE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn. Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s). No unusual health effects are anticipated after exposure to this gas mixture, due to the small cylinder size. If any adverse symptom develops after over-exposure to this gas mixture, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and cardior pulmonary resuscilation if necessary.

n the event of severe over-exposures in which the victim is unconscious, vomiting may occur as the person awakes. In order to prevent aspiration, exposed individuals should be placed on their side with their head at the level or slightly lower than their body. Due the possibility of the victim developing pulmonary edema, the symptoms of which can be delayed up to 72 hours, the victim should be discouraged from physical exertion during this time period.

SKIN EXPOSURE: If this gas mixture contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention.

NOTICE! In the event of severe over-exposures, delayed onset of life-threatening symptoms may occur. Victim(s) must be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s). Medical care providers should refer to Section 11 (Toxicological Information) of this MSDS for additional information.

EYE EXPOSURE: If irritation of the eye develops after exposure to the gas mixture, open victim’s eyes while under gentle running water. Use sufficient force to open eyelids. Have victim “roll” eyes. Minimum flushing is for 15 minutes.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOGIONITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

 Upper (UEL): Not applicable.
 Lower (LEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Non-flammable gas. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture contains Nitrogen Dioxide, which is toxic and presents a health hazard to fire-fighters. This gas mixture is not flammable; however, contact with fire, water, or other substances, may cause the released fire to burn in the heat of the fire. Pressure in a container can build-up due to heat and it may rupture if pressure relief devices fail to function.


Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this gas mixture presents significantly less risk associated with Nitrogen Dioxide over-exposure, an oxygen-deficient environment, or other safety hazards, than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Uncontrolled releases associated with Nitrogen Dioxide over-exposure, an oxygen-deficient environment, or other safety hazards, than a similar release from a larger cylinder, must be considered.

If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING and USE

STORAGE AND HANDLING PRACTICES: Be aware of any signs of dizziness or breathing difficulty, especially if work is done in poorly ventilated areas; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms. Due to Nitrogen Dioxide over-exposure or an oxygen-deficient environment. Eye wash stations/automatic showers should be near areas where this gas mixture is used or stored.

Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature approximately 21°C (70°F). Cylinders should be stored in dry, well-ventilated areas away from sources of heat, ignition and direct sunlight. Protect cylinders against physical damage. Store containers away from heavily trafficked areas and emergency exits. Store away from process and production areas, away from elevators, building and room exits or main aisles leading to exits. Consider installation of leak

NON-FLAMMABLE GAS MIXTURE MSDS

EFFECIVE DATE: JUNE 7, 2010
P/N 3456 PAGE 2 OF 5
7. HANDLING AND USE (continued)
detection and alarm for storage and use areas. Have appropriate extinguishing equipment in the storage area (i.e. sprinkler system, portable fire extinguishers). Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING!** Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.

**SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING!** Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

**PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:** Follow practices indicated in Section 6 (Accidental Release of Material) to ensure the safety of personnel and the environment when certain application equipment is located in a confined or closed space. Use purge gas handling equipment with inert gas (i.e. nitrogen) before attempting repairs. Always use purge in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

**VENTILATION AND ENGINEERING CONTROLS:** No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this gas mixture in well-ventilated areas. Employee exposure should be monitored and reduced to the lowest practical levels using ventilation or other, appropriate, engineering controls.

**RESPIRATORY PROTECTION:** No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if the limit of Nitrogen Dioxide exceeds exposure limits presented in Section 2 (Composition and Information of Ingredients) and oxygen levels are below 19.5% or unknown during emergency response to a release of this gas mixture. If respiratory protection is needed, use only positive pressure, full facepiece, approved, and listed by the American National Standards Institute (ANSI), the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable OSHA State regulations, or the Canadian CSA Standard (Z94.4-93). Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA’s Respiratory Protection Standard (1910.134-1999). Respiratory selection guidelines from NIOSH for Nitrogen Dioxide are provided below for information.

**EYE PROTECTION:** Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

**HAND PROTECTION:** No special protection is needed under normal circumstances of use. If hazardous to the skin, it may be due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

**BODY PROTECTION:** No special protection is needed under normal circumstances of use. If hazardous to the skin, it may be due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

9. PHYSICAL AND CHEMICAL PROPERTIES

The following information is for the nitrogen, the main component of this gas mixture.

**GAS DENSITY @ 32°F (0°C) and 1 atm:** 0.072 lb/ft³ (1.153 kg/m³)

**FREEZING/MELTING POINT @ (10 psig):** -210°C (-343.8°F)

**SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C):** 0.906

**SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm:** 0.023

**EVAPORATION RATE (nBuAc = 1):** Not applicable.

**ODOR THRESHOLD:** Not applicable.

**VAPOR PRESSURE @ 70°F (21.1°C) psig:** Not applicable.

**COEFFICIENT WATERFALL DISTRIBUTION:** Not applicable.

The following information is for the gas mixture.

**APPEARANCE, ODOR AND COLOR:** This gas mixture is a colorless, to red-brown, oxidizing gas which is either odorless or has an acrid odor.

**HOW TO DETECT THIS SUBSTANCE (warning properties):** The color or odor may be warning properties associated with a release of this gas mixture. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY AND REACTIVITY

**STABILITY:** Normally stable in gaseous state.

**DECOMPOSITION PRODUCTS:** Nitrogen Dioxide decomposes in water to form nitric and nitrous acids. Above 160°C (320°F), Nitrogen Dioxide decomposes to nitric oxide and oxygen. The components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Titanium will burn in Nitrogen (a component of this gas mixture). Lithium reacts slowly with Nitrogen at ambient temperatures. The Nitrogen Dioxide and Oxygen components of this gas mixture are incompatible with combustible and flammable materials. Nitrogen Dioxide is incompatible with many powdered metals.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

**TOXICITY DATA:** The following toxicity data are available for the components of this gas mixture:

**NITROGEN:** There are no specific toxicity data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment.

**NITROGEN DIOXIDE:** Mutation in Microorganisms System (Salmonella typhimurium) 6 ppm

Sister Chromatid Exchange (hamster lung) 5 ppm for 10 months

TDLo (inhalation, mouse) 22 ppm, Reproductive effects

**NITROGEN DIOXIDE (continued):**

TCLo (inhalation, rat) 0.85 mg/m³, Teratogenic effects

LClO (inhalation, human) 200 ppm for 1 month

TCLo (inhalation, man) 0.5 ppm for 10 months, pulmonary effects

LCClO (inhalation, rat) 88 ppm for 4 hours

LClO (inhalation, mouse) 1000 ppm for 10 minutes

**SUSPECTED CANCER AGENT:** The components of this gas mixture are listed by agencies tracking the carcinogenic potential of chemical compounds, as follows:

**NITROGEN DIOXIDE (continued):**

LClO (inhalation, dog) 123 mg/m³

LClO (inhalation, monkey) 123 mg/m³ for 8 hours

LClO (inhalation, rabbit) 315 ppm for 15 minutes

LClO (inhalation, guinea pig) 30 ppm for 1 hour

**OXGEN:** Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA’s Respiratory Protection Standard (1910.134-1999). Respiratory selection guidelines from NIOSH for Nitrogen Dioxide are provided below for information.

**NOISH/OSHA RECOMMENDATIONS FOR NITROGEN DIOXIDE CONCENTRATIONS IN AIR:**

Up to 20 ppm

Supplied Air Respirator (SAR) operated in a continuous-flow mode; or full-facepiece Self-Contained Breathing Apparatus (SCBA); or full-facepiece SAR.

Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

The IDLH concentration for Nitrogen Dioxide is 20 ppm.

**EYE PROTECTION:** Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

**HAND PROTECTION:** No special protection is needed under normal circumstances of use. If hazardous to the skin, it may be due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

**BIOLOGICAL EXPOSURE INDICES (BEIs):** No mutagenicity effects in humans have been described for the components of this gas mixture. The Nitrogen Dioxide component of this gas mixture has been shown to cause genetic damage in bacterial studies.

**MUTAGENICITY:** No mutagenicity effects have been described for the components of this gas mixture. The Nitrogen Dioxide component of this gas mixture has been shown to cause genetic damage in bacterial studies.

**TERATOGENICITY:** No human teratogenic effects have been described for the components this gas mixture. The Nitrogen Dioxide component of this gas mixture has been shown to cause adverse effects in animal studies.

**A MUTAGEN IS A CHEMICAL WHICH CAUSES PERMANENT CHANGES TO GENETIC MATERIAL (DNA) SUCH THAT THE CHANGES WILL PROPAGATE THROUGH GENERATION LINEs. AN EMBRYOTOXIN IS A CHEMICAL WHICH CAUSES DAMAGE TO A DEVELOPING EMBRYO (I.E. WITHIN THE FIRST EIGHT WEEKS OF PREGNANCY IN HUMANS), BUT THE DAMAGE DOES NOT PROPAGATE ACROSS GENERATIONAL LINES. A TERATOGEN IS ANY SUBSTANCE WHICH INFECTS IN ANY WAY WITH THE REPRODUCTIVE PROCESS.**

**BIOLOGICAL EXPOSURE INDICES (BEIs):** Currently, Biological Exposure Indices (BEIs) have not been determined for the components of this gas mixture.
12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The gas will be dissipated rapidly in well-ventilated areas. Complex reactions of Nitrogen Dioxide occur in the atmosphere which contribute to air pollution. The following environmental data are applicable to the components of this gas mixture.

NITROGEN: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 20°C. Log K_w = -0.65

OXYGEN: Water Solubility = 1 volume Oxygen/32 volumes water at 20°C. Log K_w = -0.65

EFFECT OF MATERIAL ON PLANTS OR ANIMALS: Adverse effects on animals would be related to respiratory system damage, and damage to the skin and eyes, due to the presence of Nitrogen Dioxide. Because Nitrogen Dioxide produces corrosive nitric acid, upon contact with air or moisture, plants may be damaged or destroyed.

EFFECT OF CHEMICAL ON AQUATIC LIFE: The Nitrogen Dioxide component of this gas mixture hydrolyzes to nitric dioxide when in contact with water. In the unlikely event that a release of this gas mixture occurs near a river or other body of water, fish and other aquatic life may be harmed.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION

This gas mixture is hazardous as defined by 49 CFR 172.101 by the U.S. Department of Transportation.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen*) for the gas component with the next highest concentration next to Nitrogen.

Hazard Class Number and Description: 2.2 (Non-Flammable Gas)

UN Identification Number: UN 1956

Packing Group: Not applicable.

DOT Label(s) Required: Non-Flammable Gas


Marine Pollutant: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

Special Shipping Information: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Transport Canada Transportation of Dangerous Goods Regulations: This gas is considered as Dangerous Goods, per regulations of Transport Canada.

Proper Shipping Name: Compressed gases, n.o.s. (*Oxygen, Nitrogen*) for the gas component with the next highest concentration next to Nitrogen.

Hazard Class Number and Description: 2.2 (Non-Flammable Gas)

UN Identification Number: UN 1956

Packing Group: Not Applicable

Hazard Label: Class 2.2 (Non-Flammable Gas)

Special Provisions: None

Explosive Limit and Limited Quantity Index: 0.12

ERAP Index: None

Passenger Carrying Ship Index: None

Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index: 75


Note: Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992).

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The components of this gas mixture are subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>SARA 302</th>
<th>SARA 304</th>
<th>SARA 313</th>
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<tbody>
<tr>
<td>Nitrogen Dioxide</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

U.S. SARA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE THRESHOLD PLANNING QUANTITY: Nitrogen Dioxide = 10 lb (45.4 kg).

U.S. SARA SECTION 303 EXTREMELY HAZARDOUS SUBSTANCE REPORTABLE QUANTITY: Sulfur Dioxide = 100 lb (45.4 kg)

U.S. TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Nitrogen Dioxide = 10 lb (4.45 kg).

OTHER U.S. FEDERAL REGULATIONS:

- Nitrogen Dioxide is subject to the requirements of CFR 29 1910.1000. Nitrogen Dioxide is listed on Table Z.1.

- Depending on specific operations involving the use of this gas mixture, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Under this regulation Nitrogen Dioxide is listed in Appendix A. The threshold quantity for Nitrogen Dioxide under this regulation is 250 lb (113.5 kg); therefore, a single cylinder of this gas mixture would not be subject to this regulation.

- Nitrogen Dioxide, Anhydrous is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The reportable quantity under this regulation is 10,000 lb (4545 kg).

- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).

- Nitrogen Dioxide, Nitrogen and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases.

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 121

Note: Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992).

U.S. STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: Nitrogen Dioxide.

California - Permissible Exposure Limits for Chemical Contaminants: Nitrogen Dioxide, Nitrogen.

Florida - Substance List: Oxygen, Nitrogen Dioxide, Nitrogen.

Illinois - Toxic Substance List: Nitrogen Dioxide.

Kansas - Section 302/313 List: None.

Massachusetts - Substance List: Oxygen, Nitrogen Dioxide, Nitrogen.

Michigan - Critical Materials Register: None.

Minnesota - List of Hazardous Substances: Nitrogen Dioxide.

Missouri - Employer Information/Toxic Substance List: Nitrogen Dioxide.

New Jersey - Right to Know Hazardous Substance List: Oxygen, Nitrogen Dioxide, Nitrogen.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: Nitrogen Dioxide.


Rhode Island - Hazardous Substance List: Oxygen, Nitrogen Dioxide.

Texas - Hazardous Substance List: Nitrogen Dioxide, Nitrogen.

West Virginia - Hazardous Substance List: Nitrogen Dioxide.

Wisconsin - Toxic and Hazardous Substances List: Nitrogen Dioxide.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this gas mixture is on the California Proposition 65 list.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL INVENTORY STATUS: The components of this gas mixture are listed on the DSL Inventory.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LIST: The components of this gas mixture are not on the CEPA Priorities Substances List.

CANADIAN WHIMS INFORMATION: This gas mixture is categorized as a Controlled Product, Hazard Classes A, D2B, and C, as per the Controlled Product Regulations.
INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. CALGAZ will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scraping cylinders involves some preparation before the metal dealer may accept them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 "Safe Handling of Compressed Gases in Containers"
AV-1 "Safe Handling and Storage of Compressed Gases"
"Handbook of Compressed Gases"

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
PO Box 3519, La Mesa, CA 91944-3519
619/670-0609
Fax on Demand: 1-800/231-1366

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